

Date de dépôt: 8 mai 2007

Rapport

de la Commission de l'environnement et de l'agriculture chargée d'étudier l'initiative populaire 137 « Pour l'interdiction des races de chiens d'attaque et autres chiens dangereux »

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| 1. | Arrêté du Conseil d'Etat constatant l'aboutissement de l'initiative, publié dans la Feuille d'avis officielle le | 15 septembre 2006 |
| 2. | Débat de préconsultation sur la base du rapport du Conseil d'Etat au sujet de la validité et de la prise en considération de l'initiative, au plus tard le | 15 décembre 2006 |
| 3. | Décision du Grand Conseil au sujet de la validité de l'initiative sur la base du rapport de la Commission législative, au plus tard le | 15 juin 2007 |
| 4. | Sur la base du rapport de la commission désignée à cette fin, décision du Grand Conseil sur la prise en considération de l'initiative et sur l'opposition éventuelle d'un contre-projet, au plus tard le | 15 mars 2008 |
| 5. | En cas d'opposition d'un contre-projet, adoption par le Grand Conseil du contre-projet, au plus tard le | 15 mars 2009 |

RAPPORT DE LA MAJORITÉ

Rapport de M^{me} Emilie Flamand

Mesdames et
Messieurs les députés,

La Commission de l'environnement et de l'agriculture a étudié l'initiative 137 « Pour l'interdiction des races de chiens d'attaque et autres chiens dangereux » lors de ses séances des 8 et 15 mars sous les présidences successives de M. Sébastien Brunny et de M^{me} Béatrice Hirsch Aellen. Les commissaires ont pu compter sur la présence de M^{me} Karine Salibian Kolly, secrétaire adjointe au Département du territoire, et de M. Luc Magnenat, Office vétérinaire cantonal. Les procès-verbaux ont été tenus par M^{me} Caroline Martinuzzi. Que toutes ces personnes soient ici remerciées.

En préambule, il convient de rappeler que la commission s'est déjà longuement penchée sur le sujet de la réglementation en matière de chiens lors de son étude du projet de loi 9835, projet de loi du Conseil d'Etat modifiant la loi sur les conditions d'élevage, d'éducation et de détention des chiens (M 3 45), récemment adopté par le Grand Conseil.

Audition de M^{me} Verena Graf et de M. Jean Barth, initiants

M. Barth tient à préciser en premier lieu que, malgré les nombreuses critiques dont il a été l'objet lors du lancement de cette initiative, il n'est absolument pas un ennemi des animaux ; il ajoute avoir lutté contre la chasse et avoir toujours possédé des chiens. Il commente ensuite l'initiative en expliquant que son principal objectif est de garantir la sécurité publique. Il considère en effet qu'elle répond à un intérêt public prépondérant ainsi qu'au principe de nécessité. En effet, M. Barth estime qu'aucune mesure moins contraignante ne permettrait d'atteindre l'objectif de sécurité publique visé par l'IN 137.

Celle-ci vise principalement à interdire l'élevage, la commercialisation et la détention de chiens dangereux, et prohibe donc la sélection et la reproduction de caractères génétiques d'agressivité ainsi que de caractéristiques morphologiques impliquant une plus grande dangerosité (par exemple, forme ou puissance de la mâchoire).

Pour les chiens de plus de 25 kg, l'IN 137 prévoit des mesures d'information et de formation à l'égard des maîtres, ces mesures étant sanctionnées par une autorisation de détention.

Un commissaire (PDC) demande à M. Barth son sentiment par rapport à la loi nouvellement votée, qui répond à certains des problèmes soulevés par l'initiative. M. Barth considère que la nouvelle loi ne règle pas le problème des chiens dangereux, car elle ne décrète pas l'interdiction totale des races dangereuses.

Une commissaire (S) s'enquiert des législations en matière de détention et d'élevage de chiens dans d'autres cantons, voire d'autres pays. M. Barth n'a pas d'information sur les autres cantons ; dans d'autres pays, des mesures ont été prises, mais ne sont pas aussi drastiques que celles proposées par l'initiative.

Un commissaire (Ve) demande à l'initiant comment se passerait selon lui l'examen pour les détenteurs de chiens de plus de 25 kg : qui le ferait passer ? M. Barth ne pense pas que l'application de cette mesure représente un problème majeur. Il considère que c'est comme en matière de circulation routière et de limite de vitesse : il faut, à un moment donné, fixer une limite, en l'occurrence 25 kg. Le commissaire demande ce qu'il adviendrait en cas d'échec au test. M. Barth imagine que plusieurs essais seraient possibles, comme pour le permis de conduire. Si le maître s'avère incompetent, il faudrait alors lui retirer son chien.

Le même commissaire soulève alors le problème de l'identification des races : comment, en cas de recours au tribunal, prouver qu'un maître détient un animal d'une race interdite ? M. Barth indique que l'IN 137 prévoit l'interdiction non seulement des races dangereuses, mais aussi de leurs croisements. Les spécialistes sont parfaitement capables de reconnaître les races et les croisements et, en cas de doute, on pourrait évaluer le chien sur son comportement. Le fait de dresser une liste précise ne sert à rien car, avec les croisements, on peut trouver des chiens dangereux avec une morphologie de labrador et vice-versa.

Un commissaire (UDC) soulève également le problème du contrôle, mais par rapport à la clandestinité de certaines ventes de chiens, M. Barth estime que tout chien dangereux découvert doit être euthanasié. Actuellement, un tiers des chiens n'est pas déclarés, le meilleur moyen d'effectuer un contrôle est de les interdire, de sorte à ce qu'ils disparaissent totalement d'ici une dizaine d'années.

Un commissaire (L) demande si des exceptions seraient prévues pour les touristes et les personnes de passage. L'initiant répond qu'il faut avoir la

même rigueur que pour les armes : elles sont interdites y compris aux touristes, il faut donc qu'il en soit de même pour les chiens.

Un commissaire (UDC) trouve cette initiative un peu utopique. Il constate que l'on cherche toujours à réglementer davantage la vie des gens. M. Barth indique qu'il est également à l'origine de l'initiative contre la fumée passive. Si l'on en vient à lancer des initiatives, c'est parce que trop de personnes font preuve d'incivisme. La seule solution à ce problème est de poser des principes clairs dans la loi.

Audition du D^r Noemi Centeno Wolf, chef de clinique au Département de pédiatrie des HUG, et du D^r Aaron Vunda, chef de clinique au service d'accueil et d'urgences pédiatriques du Département de pédiatrie des HUG

Le D^r Centeno Wolf explique être en charge principalement des morsures depuis 1999 ; elle en assure ainsi le suivi sur les enfants. Elle a d'ailleurs effectué une étude sur les morsures de chiens à Genève en récoltant notamment des échantillons de morsures. Elle explique que 80 à 90% des enfants se rendant aux urgences pour cause de morsure ont été mordus par des chiens, contre 5 à 15% seulement par des chats. On compte environ 195 morsures par an pour 100 000 habitants en Suisse (contre 18 000 aux Etats-Unis !), dont 60% sur des enfants. Dans 80% des cas, le chien est connu de l'enfant et dans 50% des cas, la morsure se fait en l'absence des parents.

L'étude des circonstances de la morsure montre que celle-ci intervient généralement par accident, par réflexe d'agression en cas de peur, par hiérarchie familiale, lorsque le chien souffre de maladie, lorsqu'une chienne veut défendre ses petits, ou à cause d'un comportement pathologique du chien.

Parmi les séquelles potentielles pour l'enfant, on peut citer l'hémorragie (cause principale de décès), les infections, les séquelles esthétiques ou fonctionnelles et le stress psychologique (cauchemars, peur des chiens, etc.). Un suivi est donc important pour éviter ce genre de trouble. En ce qui concerne les morsures mortelles, à titre indicatif, on recense entre 0 et 2 cas par an en France, entre 10 et 15 aux Etats-Unis et 3 cas au cours des dix dernières années en Suisse.

Le D^r Centeno Wolf donne ensuite aux commissaires quelques éléments concernant la distribution des races canines ayant mordu en Suisse. En ce qui concerne les morsures non sévères, on retrouve des chiens de toutes races, dont beaucoup de races croisées. En ce qui concerne les morsures sévères, 40% d'entre elles proviennent de pitbulls, 15% de bergers allemands, 12% de

huskies, rottweilers et dobermans. Elle précise que ces chiffres sont à manier avec précaution.

Elle donne ensuite quelques pistes quant à la prévention des morsures chez l'enfant. Les principes de base sont bien entendu de ne jamais laisser un enfant seul avec un chien et d'apprendre aux enfants à ne pas toucher les chiens inconnus et à ne pas déranger un chien qui mange, qui dort, ou une femelle avec ses petits. Les enfants doivent également apprendre à reconnaître les signes d'agressivité. Trois brochures ont été éditées par l'Office vétérinaire cantonal concernant ces mesures de prévention et le comportement à adopter en cas d'attaque ; il serait positif que ces brochures soient distribuées dans les écoles. Du côté des propriétaires de chiens, il est important qu'ils suivent des cours de dressage.

Enfin, au niveau des autorités, le D^r Centeno Wolf estime que la puce électronique, qui est en quelque sorte le document d'identité de l'animal, est une bonne chose. Il faut selon elle limiter les races dangereuses et signaler toute attaque. Ce dernier point pose souvent problème, car les médecins sont tenus au secret médical et certains patients refusent de signaler les cas de morsures. Or, si le corps médical passe outre ce refus, on court le risque que ces personnes ne viennent plus se faire soigner, de peur de voir leur chien dénoncé.

A un commissaire (UDC) qui lui demande son avis sur l'initiative, le D^r Centeno Wolf répond qu'elle est partagée. Le problème est délicat et émotionnel, car le chien est l'ami de l'homme et on a tendance à trop l'humaniser. Or, le chien n'a pas le droit de mordre et s'il mord une fois, c'est une fois de trop. Dès lors, si les gens ne connaissent pas les limites de leur animal, les autorités doivent prendre des mesures. Cela étant dit, elle trouve que l'interdiction est un peu excessive car certaines personnes apprécient les races de chiens de type pitbull qui, lorsqu'ils sont bien dressés, ne posent pas de problème. Au contraire, lorsque les maîtres n'ont pas un comportement adéquat, ces chiens peuvent tuer ou traumatiser gravement des personnes.

Un commissaire (UDC) demande si les gens gardent généralement leur chien après que celui-ci a mordu gravement. Le D^r Centeno Wolf indique que parmi les cas recensés dans son étude, deux chiens ont été euthanasiés, deux chiens ont été soumis à un contrôle chez le vétérinaire ; pour tous les autres, rien n'a été fait. Pourtant, un chien qui a mordu mordra à nouveau, elle pense qu'il faut en tenir compte.

Un commissaire (Ve) demande s'il existe différentes catégories de morsures en fonction des races. Le D^r Centeno Wolf répond qu'il existe en

effet des différences selon la taille du chien : les petits chiens font des morsures généralement sans gravité, les bergers allemands provoquent souvent des plaies pénétrantes et les gros chiens font des lacérations importantes. Les pitbulls, eux, mordent très gravement en raison des mandibules de leur mâchoire, qu'ils peuvent serrer comme un étau, leur permettant ainsi de ne plus lâcher leur proie.

Audition du Département du territoire

M^{me} Salibian-Kolly indique que le Conseil d'Etat maintient la position qu'il a exprimée dans le projet de loi 9835, à savoir qu'il préconise un contrôle accru des races molossoïdes, notamment en soumettant leur détention à autorisation, mais qu'il n'est pas favorable à une interdiction totale de ces races, interdiction qui pourrait provoquer une augmentation de la clandestinité. Elle rappelle enfin que les mesures prévues dans la loi font l'objet d'un règlement transitoire valable jusqu'à fin 2007.

M. Magnenat ajoute que 780 chiens potentiellement dangereux ont été enregistrés à fin 2006 et que 480 autorisations de détention ont été délivrées. En 2007, seules 8 demandes ont été déposées, ce qui prouve que le caractère dissuasif du règlement déploie son effet.

Un commissaire (L) demande la position du département par rapport à l'exécutabilité de l'initiative et notamment du problème des frontières. M^{me} Salibian-Kolly signale que l'IN 137 pose en effet de nombreux problèmes d'application. Le fait de soumettre à autorisation tous les chiens de plus de 25 kg représente un énorme travail. Quant au problème du tourisme, il est effectivement épineux, puisque les détenteurs et *a fortiori* les chiens français et vaudois ne seraient pas soumis à la législation genevoise. L'initiative pose enfin problème par rapport au droit supérieur.

Un commissaire (Ve) s'enquiert du sort de la loi 9835 en cas d'acceptation de l'IN 137. M^{me} Salibian-Kolly répond que la loi sur les chiens sera soumise au peuple le 17 juin prochain. Si l'initiative, qui devrait être votée en 2008, est acceptée par la population, il faudra modifier la loi en conséquence.

Un commissaire (L) demande si les vétérinaires jouent bien le jeu et collaborent avec le département, par exemple en dénonçant les chiens potentiellement dangereux. Il ajoute, en complément à sa question, que si l'interdiction devait être votée, on court le risque de voir les gens emmener leur molosse se faire soigner en France ou dans le canton de Vaud. M^{me} Salibian-Kolly répond que le degré de collaboration des vétérinaires est variable, certains sont très coopératifs alors que d'autres se contentent de leur

rôle sanitaire. Elle confirme que le risque de clandestinité sera important en cas d'interdiction.

Position des groupes

Le groupe Socialiste déclare soutenir l'initiative, puisque celle-ci va dans le sens de l'amendement qu'il avait déposé en plénière visant à interdire les chiens potentiellement dangereux. Il ajoute être ouvert à une proposition de contre-projet allant dans le sens de l'initiative.

Une commissaire (Ve) indique qu'au vu des débats, de l'exposé du gouvernement et du vote récent de la loi 9835, son groupe s'opposera à l'IN 137. Elle déclare par ailleurs ne pas être favorable à l'élaboration d'un contre-projet, puisque la loi 9835, soumise prochainement au peuple, fait office de contre-projet indirect et que la population aura donc le choix.

Le PDC se déclare également opposé à l'initiative ainsi qu'à l'opportunité d'un contre-projet.

Le groupe Radical indique que la loi 9835 suffit selon lui à satisfaire les besoins. Il refusera donc l'initiative, mais regrette qu'elle ne puisse pas être soumise au vote en même temps que la loi, afin de permettre un véritable choix aux votants.

Le groupe Libéral partage la position exprimée par le commissaire Radical.

Un commissaire (UDC) indique que son groupe, satisfait de la loi 9835, s'opposera également à l'initiative. Il ajoute qu'il est indispensable que la loi, une fois en vigueur, soit appliquée avec la plus grande sévérité.

Plusieurs commissaires soulignent l'importance d'une application stricte de la loi et reviennent sur le rôle qui devra être joué par les agents de sécurité municipaux dans cette application.

La présidente met aux voix la prise en considération de l'Initiative 137 :

Oui : 1 (1 S)

Non : 10 (2 Ve, 2 PDC, 3 L, 2 UDC, 1 MCG)

Abst. : 2 (1 S, 1 R)

La prise en considération de l'Initiative 137 est refusée.

La présidente met ensuite aux voix l'opposition d'un contre-projet à l'Initiative 137 :

Oui : 1 (1 S)

Non : 11 (1 S, 2 Ve, 2 PDC, 3 L, 2 UDC, 1 MCG)

Abst. : 1 (1 R)

La commission refuse d'opposer un contre-projet à l'Initiative 137.

Suite au vote du projet de loi 9835 à une large majorité de notre Parlement et aux explications développées ci-dessus, la rapporteure vous invite, Mesdames et Messieurs les députés, à suivre la Commission de l'environnement et de l'agriculture en refusant l'initiative 137 et en renonçant à lui opposer un contre-projet.

Secrétariat du Grand Conseil**IN 137****Initiative populaire****Pour l'interdiction des races de chiens d'attaque et autres chiens dangereux**

Le Comité d'initiative « Pour l'interdiction des races de chiens d'attaque et autres chiens dangereux » a lancé l'initiative populaire intitulée « Pour l'interdiction des races de chiens d'attaque et autres chiens dangereux », qui a abouti.

Le tableau ci-dessous indique les dates ultimes auxquelles cette initiative doit être traitée aux différents stades du processus d'examen des initiatives prévus par la loi.

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| 1. Arrêté du Conseil d'Etat constatant l'aboutissement de l'initiative, publié dans la Feuille d'avis officielle le | 15 septembre 2006 |
| 2. Débat de préconsultation sur la base du rapport du Conseil d'Etat au sujet de la validité et de la prise en considération de l'initiative, au plus tard le | 15 décembre 2006 |
| 3. Décision du Grand Conseil au sujet de la validité de l'initiative sur la base du rapport de la Commission législative, au plus tard le | 15 juin 2007 |
| 4. Sur la base du rapport de la commission désignée à cette fin, décision du Grand Conseil sur la prise en considération de l'initiative et sur l'opposition éventuelle d'un contre-projet, au plus tard le | 15 mars 2008 |
| 5. En cas d'opposition d'un contre-projet, adoption par le Grand Conseil du contre-projet, au plus tard le | 15 mars 2009 |

Initiative populaire

Pour l'interdiction des races de chiens d'attaque et autres chiens dangereux

Les soussigné-e-s, électrices et électeurs dans le canton de Genève, en application de l'article 65A de la constitution de la République et canton de Genève, du 24 mai 1847, et des articles 86 à 93 de la loi sur l'exercice des droits politiques, du 15 octobre 1982, appuient la présente initiative de révision partielle de la constitution genevoise, ayant la teneur suivante:

Article unique

La constitution de la République et canton de Genève, du 24 mai 1847, est modifiée comme suit:

Art. 178C Chiens dangereux (nouveau)

Interdictions et mesures de sécurité

¹ En vue de garantir la sécurité publique, les chiens appartenant à des races dites d'attaque ou jugées dangereuses, dont le Conseil d'Etat dresse la liste, ainsi que les croisements issus de l'une de ces races, sont interdits sur l'ensemble du territoire du canton.

² Cette interdiction s'applique à tout autre chien dressé à l'attaque ou ayant un comportement agressif ou dangereux ainsi qu'aux chiens provenant de toute lignée présentant des caractéristiques génétiques d'agressivité et de dangerosité.

³ Les chiens de grande taille, d'un poids supérieur à 25 kilos, pouvant de ce fait présenter un danger potentiel, doivent être déclarés et faire l'objet d'une éducation adéquate et d'une autorisation de détention délivrée par l'autorité compétente. Celle-ci est délivrée sur la base d'un examen destiné à évaluer le comportement de l'animal et la capacité du détenteur à le maîtriser en toutes circonstances.

⁴ Les agents de la force publique ainsi que les gardes-frontière ayant une formation adéquate sont autorisés à utiliser des chiens de races dites d'attaque. Le Conseil d'Etat adopte des règles quant à l'utilisation de chiens par la force publique.

⁵ Toute violation des alinéas 1 et 2 ainsi que de l'article 182, alinéa 2, est passible d'une peine pénale de police et entraîne le séquestre ainsi que, le cas échéant, l'euthanasie de l'animal. L'autorité compétente peut retirer l'effet suspensif aux recours interjetés contre ces mesures, qui sont également applicables aux chiens de grande taille, au sens de l'alinéa 3, n'ayant pas fait l'objet d'une autorisation de détention.

⁶ L'application des dispositions du présent article est confiée à une autorité désignée par le Conseil d'Etat, laquelle doit présenter chaque année au Grand Conseil un rapport sur ses activités.

Art. 182, al. 2 Dispositions transitoires (nouveau)

² L'interdiction des chiens dangereux, au sens de l'article 178C, alinéas 1 et 2, n'est pas applicable aux animaux qui se trouvent légalement sur le territoire du canton avant son adoption par le peuple. Toutefois et dès son entrée en vigueur, les détenteurs de chiens au sens des alinéas 1 à 3 doivent déclarer ces chiens à l'autorité compétente et obtenir, dans le délai d'une année, une autorisation de détention au sens de l'alinéa 3. De plus, les chiens visés par les alinéas 1 et 2 doivent être tenus en laisse et muselés, lorsqu'ils ne sont pas enfermés, et ils doivent être castrés ou stérilisés pour éviter une reproduction.

Date de dépôt : 7 mai 2007

Messagerie

RAPPORT DE LA MINORITÉ

Rapport de M^{me} Françoise Schenk-Gottret

Mesdames et

Messieurs les député-e-s,

A l'automne 2006, lors des travaux de la Commission de l'environnement et de l'agriculture sur la modification de la loi sur les conditions d'élevage, d'éducation et de détention des chiens, le groupe socialiste avait proposé un amendement à l'article 3A dont la teneur était la suivante : « Les chiens appartenant à des races dites d'attaque (type molosse), ainsi que les croisements issus de ces races, sont interdits ». La majorité de la commission avait refusé cet amendement, ce qui nous avait obligés de faire un rapport de minorité. Ce même amendement n'avait pas obtenu de suffrages suffisants et avait été aussi refusé en séance plénière.

Lors du cheminement de l'IN 137, nous avons apprécié que le Conseil d'Etat souligne dans son rapport les qualités de cette initiative, aussi bien quant à sa forme que quant au fond ; cela même s'il ne s'y ralliait pas. La Commission législative lui a reconnu les mêmes qualités dans son rapport du 14 novembre 2006 ; la plénière a fait de même et a envoyé l'initiative à la Commission de l'environnement, qui l'a rejetée.

Notre groupe ne pouvait qu'adopter cette initiative qui reprend pour l'essentiel le contenu de l'amendement qu'il avait déposé lors de la révision de la loi sur conditions d'élevage, d'éducation et de détention des chiens, et qui avait été refusé.

L'essentiel sur la motivation de cet amendement a été largement développé dans le rapport de première minorité du projet de loi 9835-A, du 3 novembre 2006. Aussi je vous renvoie à ce rapport et me contenterai de reprendre les arguments du comité d'initiative, de me référer aux auditions des médecins, ainsi que du psychiatre qui, très aimablement, a complété les explications de ses confrères et fourni des documents que je joins en annexes. Enfin je relèverai le constat des différentes dispositions prises dans les

cantons de Fribourg et du Valais, ainsi que l'état des travaux au niveau du Conseil national.

Rappel des déclarations relevantes des personnes auditionnées

M. Jean Barth, président du comité d'initiative

rappelle que l'IN 137 a pour objectif de protéger la sécurité publique ; elle répond à un intérêt public prépondérant ainsi qu'au principe de nécessité, car aucune mesure moins incisive (!) ne permettrait d'atteindre le même but et donc de faire disparaître dans les mêmes proportions les risques liés aux chiens potentiellement dangereux.

Pour l'essentiel, il est utile de se référer au texte de son intervention qui se trouve en annexe.

Certaines de ses réponses aux député-e-s, sont intéressantes ; il souligne qu'un tiers des chiens à Genève n'est pas déclarés. La meilleure manière d'effectuer le contrôle des chiens d'attaque est de les interdire. Ainsi, en dix ans, il n'y en aura plus.

M. Barth, toujours en réponse à une question, constate que peu de gens de passage ou de touristes qui se rendent à Genève voyagent avec leurs pitbulls; il faut avoir la même attitude que par rapport aux armes : les armes sont interdites, même pour le tourisme. Il doit en être de même avec les chiens d'attaque.

Enfin M. Barth estime qu'une liste de chiens dangereux n'a pas à figurer dans un article constitutionnel. Il n'existe pas de raison scientifique de dresser une liste définitive. On doit envisager l'évolution des races. Toute race est susceptible d'évoluer. Le berger allemand était produit, il y a vingt ans, par les services de douane et de police. Il était devenu dangereux et les éleveurs ont dû produire des chiens moins réactifs et moins dangereux.

Les médecins auditionnés

indiquent que 53% des enfants sont mordus à la tête ou au cou, puisque la tête de l'enfant se trouve à la hauteur de la tête du chien. Souvent la chirurgie est possible, mais il arrive que fréquemment le chien mange le morceau arraché. Dans ce cas-là, il faut procéder à de la chirurgie reconstructive. Les complications peuvent être : une hémorragie (cause principale de mort), les infections, les séquelles esthétiques, les séquelles fonctionnelles et le stress psychologique (cauchemars, peur des chiens). Un suivi est important pour éviter tout trouble.

Les journées d'hospitalisation, les consultations, la nécessité d'un suivi, tout cela entraîne des coûts ; la rapporteure de majorité fait état de tous les aspects de cette audition dans son rapport. Je me bornerai donc à vous renvoyer aux publications, obligeamment envoyées par le D^r Centeno Wolf, qui figurent en annexes.

D^r Rémy Barbe, responsable de l'Unité de pédopsychiatrie de l'Hôpital des enfants

Le D^r Barbe n'a pas pu participer à l'audition, n'étant pas disponible au jour prévu. Toutefois, il a fait parvenir aux député-e-s une série d'articles scientifiques (cf. annexes) qui concernent les conséquences des morsures de chien chez l'enfant, en soulignant le fait que plus de la moitié de ceux-ci présente des signes de syndrome post-traumatique (PTSD).

Comme il est vraisemblable que la lecture d'articles scientifiques en anglais ne va pas passionner la majorité d'entre nous, nous nous référerons à l'article du D^r Christian Duchène (cf. annexe), dont les explications permettent un accès aisé à des notions inconnues aux « laïcs » que sont les députés d'un parlement :

« La personne qui présente le tableau de stress post-traumatique peut être la victime elle-même de l'événement. Elle peut être le témoin d'un accident survenu à un proche, ou d'une catastrophe ayant concerné de nombreuses victimes.

Le tableau se présente sous la forme d'un retour permanent de l'événement, sous forme de cauchemars, ou d'envahissement de la conscience chez le sujet éveillé, de souvenirs fréquents.

Ces troubles s'accompagnent souvent d'insomnies, de dépression, d'irritabilité, parfois de violences ou de conduites pathologiques (alcoolisme...). Au maximum ils entraînent une désadaptation sociale importante.

Quelles en sont les causes, quelle est l'évolution ?

Confrontées au même événement traumatisant, certaines personnes n'en subissent pas de séquelles et d'autres développent un syndrome de stress post-traumatique. On parle de syndrome de stress post-traumatique lorsque les symptômes durent plus d'un mois (ils débutent souvent plusieurs semaines après l'événement). La durée des troubles peut se limiter à quelques mois, ou au contraire durer beaucoup plus longtemps, voire devenir chronique.

Quel est le traitement ?

Il est souvent difficile. Certains médicaments sont utiles pour traiter les symptômes tels que dépression (antidépresseurs) ou anxiété (anxiolytiques). Mais le traitement de fond repose en règle générale sur la psychothérapie, soit psychothérapie d'inspiration analytique, soit psychothérapie comportementale. Le soutien de la famille et des proches est important mais le recours à un thérapeute spécialisé est souvent nécessaire. »

Le témoignage des médecins et le contenu de leur audition a fortement impressionné les député-e-s. Il a sans aucun doute conforté la minorité dans sa volonté de voir interdire les chiens d'attaque et donc dans sa volonté de soutenir l'initiative.

Evolutions récentes

Au niveau fédéral, rien n'est prévu en ce qui concerne les chiens d'attaque. Malgré des demandes réitérées du Conseil national et du Conseil des Etats, le Conseil fédéral a refusé de proposer la moindre disposition.

Mais fort heureusement, le 19 avril 2007, on apprenait par la presse que « la Commission de la science du Conseil national avait approuvé un projet prévoyant des mesures adaptées à chaque catégorie de chiens, qui seraient classés en fonction de leur dangerosité... Les molosses jugés dangereux seraient interdits. L'importation, l'élevage ou la possession de tels chiens pourrait entraîner des peines allant jusqu'à trois ans de privation de liberté. La possession d'un chien potentiellement dangereux serait quant à elle soumise à autorisation. Le propriétaire devrait prouver qu'il possède les connaissances nécessaires et qu'il est à même de contrôler son animal.

En cas de morsure, de comportement agressif ou si l'autorité vétérinaire a des raisons de penser que le propriétaire n'a pas le contrôle de son animal, un examen pourrait être ordonné. A la clé : le reclassement du chien dans une catégorie supérieure, ce qui pourrait entraîner jusqu'à sa mise à mort » (ATS).

Dans le canton de Fribourg, les pitbulls sont désormais interdits, le référendum n'ayant pas abouti.

Quant au cas du Valais, il est fort intéressant, et cela surtout dans ses développements récents. Dans la presse du 28 avril, nous avons appris que « le Tribunal fédéral a rejeté, le 27 avril, le recours déposé par diverses

associations et plusieurs détenteurs de chiens contre la liste des races interdites arrêtée par le Conseil d'Etat valaisan à la fin 2005...

C'est la première fois que les juges de Mon-Repos avaient à se prononcer sur la conformité avec la Constitution de l'interdiction de certaines races de chiens et de leurs croisements...

La liberté personnelle ne comprend pas le droit de détenir n'importe quelle race de chiens, a renchéri le président de la Cour, le juge Thomas Merkli. Les douze races visées ne représentent d'ailleurs que moins de 2% de l'ensemble des chiens détenus en Valais.

Ce n'est pas parce que la réglementation valaisanne est la plus sévère de Suisse qu'elle est incompatible avec la Constitution, a souligné le juge Wurzburger. Il suffit que la liste en question ne soit pas arbitraire. Or elle est pratiquement identique à celle que le Conseil fédéral avait examinée, avant d'en repousser l'idée. Les chiens qui y figurent sont donc bien des animaux qui posent des problèmes, même si sur ce point aucun consensus n'a encore pu être dégagé en Suisse. Tout de même l'attaque d'un pitbull ne peut être comparée à celle d'un teckel, a souligné le juge » (*Le Temps*, 28 avril 2007).

En effet, les tristes cas récents d'Oberglatt et de Turin sont illustratifs à cet égard.

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Conclusion

Nous sommes tout à fait conscients que l'interdiction des chiens d'attaque ne fera pas disparaître tous les risques. Mais elle donne un signal clair et éliminera sans aucun doute les risques les plus graves. Nous ne pouvons que faire nôtre cette déclaration d'un juge du Tribunal fédéral : « L'intérêt de la population à ne pas être exposée à des attaques pouvant être d'une extrême gravité, voire mortelles, pèse infiniment plus lourd que le droit des propriétaires de molosses ».

Nous vous rappelons que le chien est un animal de compagnie, qui joue un rôle important dans les familles, auprès des personnes seules et des personnes âgées ; il a un rôle à jouer dans notre vie sociale, vie qui se déroule pour l'essentiel dans un contexte urbain.

C'est pourquoi nous vous demandons, Mesdames et Messieurs les député-e-s, d'accepter l'IN 137 « Pour l'interdiction des races de chiens d'attaque et autres chiens dangereux ».

ANNEXES : mentionnées sous bibliographie.

Audition du Comité d'initiative pour l'interdiction des races de chiens d'attaque et autres chiens dangereux par la Commission de l'environnement et de l'agriculture

8 mars 2007

Intervention de Jean Barth, physiothérapeute
Président du Comité d'initiative

- L'IN 137 a pour objectif de protéger la sécurité publique. En cela elle répond à un intérêt public prépondérant, ainsi qu'au principe de nécessité, car aucune mesure moins incisive ne permettrait d'atteindre le même but, et donc de faire disparaître dans les mêmes proportions les risques liés aux chiens potentiellement dangereux.
- L'IN 137 pose un principe et comporte des dispositions qui ne sont pas directement applicables. Le législateur en déterminera la mise en œuvre, et aura à cet égard à définir d'une manière précise les modalités d'application de l'interdiction, à fixer les responsabilités et à prescrire les sanctions.
- L'IN 137 vise principalement à interdire la production, la commercialisation et la détention de chiens dangereux.

Elle entend par là l'interdiction de la sélection et de la reproduction de caractères génétiques d'agressivité, ainsi que de caractéristiques morphologiques impliquant une plus grande dangerosité, portant par exemple sur la forme et la puissance de la mâchoire.

Pour tous les chiens de plus de 25 kg, des mesures visant à l'information et à la formation des maîtres, ainsi qu'à la sociabilisation, à l'éducation et aux conditions de détention des chiens découlent de l'IN 137 ; ces mesures seront sanctionnées par une autorisation de détention.

Il est aujourd'hui admis que toutes les races de chiens existantes descendent du loup, bien qu'il ne soit pas impossible qu'il y ait eu des croisements avec d'autres canidés.

La première cohabitation prouvée (sur un site préhistorique en Allemagne) du chien avec l'homme date d'environ 15 000 ans.

La diversité actuelle des races n'est que le résultat d'un long processus de sélection par l'homme au cours des millénaires.

L'homme a en effet sélectionné des caractéristiques génétiques tant comportementales que morphologiques, en fonction de ses besoins, et donc des tâches qu'il attendait du chien : chien de chasse, de berger, de garde, de combat, d'assistance, de compagnie, etc.

Un phénomène de mode s'est hélas développé ces dernières années, qui amène certains individus, souvent immatures ou peu stables, à prendre certains chiens comme faire-valoir ou comme arme plutôt que comme animaux de compagnie. Ces chiens sont le plus souvent destinés à impressionner, à intimider, voire à menacer.

La prolifération aujourd'hui de chiens potentiellement dangereux nuit gravement à la sécurité publique. Les récents, tragiques et trop nombreux accidents, concernant principalement des enfants, nous en donnent la mesure.

Face à cette situation, il découle de l'IN 137 trois axes d'intervention concernant :

1. La génétique du chien ;
2. L'information et la formation des maîtres ;
3. Les conditions de développement, de détention et d'éducation du chien.

1. La génétique du chien

Comme nous l'avons déjà dit, il s'agit d'une part d'interdire de cultiver et de transmettre des caractères génétiques d'agressivité et de réactivité – dont nous connaissons deux déterminants biologiques neuro-endocriniens liés à un neuro-transmetteur, « la dopamine », ainsi qu'au taux d'une hormone, « la testostérone ».

Par ailleurs, Madame Andrea Schleger mentionne dans sa thèse de doctorat (1983, Université de Vienne) la sélection, dans certaines lignées de « Bull-Terriers », de « Pitbulls » et de « Staffordshire Terriers », de tares génétiques comportementales qui rendent ces chiens extrêmement agressifs, à tel point que leur vie en meute, leur reproduction naturelle et l'allaitement des chiots par la mère sont totalement impossibles sans l'intervention humaine, dès lors que leurs fonctions sociales ont été perdues.

D'autre part, nous l'avons mentionné plus haut, la sélection de caractéristiques morphologiques portant essentiellement sur la forme et la puissance de la mâchoire, comme sur la masse musculaire en général, rendent ces chiens intrinsèquement très dangereux, indépendamment de l'éducation ou du dressage qui aura pu leur être donné (bon ou mauvais).

En conséquence de ce qui précède, il est indispensable de favoriser, chez le chien destiné à être un animal de compagnie dans un cadre urbain, l'expression de caractères génétiques de sociabilité.

Signalons à ce sujet qu'au sein d'une même portée – et ce sont là les aléas de la génétique – on peut observer entre les chiots des différences comportementales importantes. Ces différences peuvent être mises en évidence par le test prédictif de Campbell (voir l'annexe 1) visant à déterminer le comportement et les aptitudes futures du chiot, et à permettre ainsi un choix, indépendamment de l'éducation ou de tout conditionnement qui pourrait lui être donné.

Nous constatons donc que les éleveurs portent une grande responsabilité quant à la « nature » et au « caractère » du chien, tant en ce qui concerne le choix des reproducteurs qu'en ce qui concerne les conditions de développement du chiot.

Ils peuvent faire évoluer une race ou une lignée vers plus ou moins de sociabilité, d'agressivité ou de dangerosité.

Cela a notamment été le cas pour certaines races autrefois créées pour le combat et aujourd'hui parfaitement paisibles et sociables, telles que le Bulldog, le Boxer ou le Shar Pei.

2. L'information et la formation des maîtres

Ceux-ci devront acquérir un bagage minimum en ce qui concerne la nature et les besoins de leur animal, ainsi que les soins et l'éducation indispensables à l'équilibre et à la maîtrise du chien en toutes circonstances.

3. Les conditions de développement, de détention et d'éducation du chien

Pour un bon développement du chiot, on veillera à ne pas le séparer trop tôt de sa mère, afin qu'il puisse acquérir de celle-ci « l'inhibition de la morsure », conditionnée vers la 5^e et la 6^e semaines. On veillera également à une bonne « imprégnation » ou sociabilisation du chiot à l'humain et à ses congénères ; celle-ci s'effectuera entre la 3^e et la 7^e semaines.

Enfin, son éducation tendra à renforcer sa sociabilisation, à établir sa soumission aux humains de son entourage et à obtenir son obéissance, afin de garantir une maîtrise de l'animal en toutes circonstances.

Les morsures sont un problème bien plus complexe qu'il n'y paraît.

Il est faux de considérer toutes les morsures comme ayant le même degré de dangerosité.

Il faut en effet distinguer deux types de morsures totalement différentes, tant dans leurs causes que dans leur gravité :

Nous avons d'une part une morsure « réactionnelle » ou « sanction », qui est la conséquence d'un comportement inapproprié de l'humain vis-à-vis du chien. C'est une morsure plus ou moins « inhibée », faisant partie du mode d'expression du chien ; c'est le plus souvent une morsure unique et de moindre gravité (en fonction de la race du chien).

D'autre part, nous avons la morsure « prédatrice » due à un comportement prédateur et totalement « désinhibé » du chien, sans que la victime n'ait eu aucune interaction avec l'animal ; c'est souvent une morsure multiple qui peut être d'une extrême gravité.

Entre ces deux types de morsures, nous pouvons évidemment observer toute une gradation de morsures, quant à leur gravité, celles-ci dépendront de l'intensité du stimulus déclencheur, de la réactivité du chien ainsi que de la race et de la puissance de l'animal.

En tout état de cause, il paraît évident que la morsure d'un Pitbull n'aura pas la même gravité que celle d'un Yorkshire.

Dans tous les cas, le nombre de morsures par race devra être mis en relation avec le nombre d'individus de cette race en circulation ; il faudra également que l'on tienne compte des différents types de morsures, pour que les statistiques nous apprennent quelque chose et que la comparaison entre races soit pertinente.

Notons que tous les autres chiens sont les premières victimes des chiens dangereux.

Il ne faut d'autre part pas sous-estimer le stress ressenti par la majorité de nos concitoyens quand ils se trouvent exposés lors de leur promenade à des chiens potentiellement dangereux, même sans comportement agressif de leur part.

Il est dans tous les cas inadmissible qu'une minorité de personnes fassent courir un risque à l'ensemble de la population, particulièrement aux plus vulnérables, les enfants.

En adoptant les mesures de sécurité publique préconisées par l'IN 137, Genève ne fera pas œuvre de pionnière tant sont nombreux les pays ayant déjà adopté des mesures d'interdiction, ainsi que des législations contraignantes dans le domaine des chiens potentiellement dangereux.

Annexes : 1) Test prédictif de Campbell

2) Argumentaire de l'Initiative 137

3) Texte de la conférence de presse du 8 mai 2006

4) Article du Prof. Martin Killias, L'Hebdo, 31 août 2006

LE TEST DE CAMPBELL

Ce test, qui doit se pratiquer quand le chiot est âgé de 7 semaines, permet de se faire une idée de son futur comportement. Le petit animal et l'homme sont seuls dans une pièce pendant les exercices.

Les différents exercices

L'attraction sociale

On dépose doucement le chiot sur le sol, puis on s'éloigne de quelques mètres dans le sens opposé à celui par lequel on est entré dans la pièce. On se met ensuite à genoux, et on frappe doucement dans ses mains pour attirer le chiot. Celui-ci viendra la queue haute ou basse, ou bien ne bougera pas. Ce test révèle son degré de sens social, de confiance ou d'indépendance.

L'aptitude à suivre l'homme

On se tient debout à côté du chiot puis l'on s'en éloigne en marchant normalement. Cela permet de voir s'il aura des aptitudes à suivre son maître. Un chiot qui ne bouge pas est très indépendant. Il est possible aussi qu'il n'ait pas vu partir son partenaire.

La contrainte

Le chiot est couché sur le sol, puis on le roule doucement sur le dos en tenant une main sur la poitrine pendant 30 secondes. Ses réactions de défense ou d'acceptation montrent s'il est capable ou pas d'accepter une dominance physique ou sociale.

La dominance sociale

On couche le chiot et on le caresse doucement du haut de la tête vers le dos. S'il est très dominant il va grogner, essayer de sauter sur l'homme, de mordre ; s'il est indépendant, il va s'écarter. Son attitude traduit son acceptation ou son refus de la dominance sociale.

La dominance en élévation

Le chiot est soulevé légèrement au-dessus du sol en étant tenu sous le ventre par les deux mains entrelacées, paumes vers le haut. Il doit rester 30 secondes dans cette position. Il n'a alors plus aucun contrôle et se trouve entièrement à la merci de l'homme. Il va soit se débattre, soit se laisser faire. Ses réactions révéleront s'il accepte ou non la dominance de l'homme. Après chaque exercice, quel que soit son comportement, le chiot doit être félicité et caressé avant d'être rendu à sa mère.

Réactions du chien au test de Campbell

Test d'attraction sociale

- A : Vient facilement, la queue haute, en sautillant et en mordillant les mains.
- B : Vient aisément, queue haute, en dormant des coups de patte vers les mains.



La dominance en élévation.

- C : Vient aisément, mais queue basse.
- D : Ne vient pas du tout.

Test d'aptitude à la suite

- A : Suit facilement, queue haute, en essayant de mordiller les pieds.
- B : Suit facilement, queue haute, vient au pied.
- C : Suit facilement, queue basse.
- D : Vient en hésitant, queue basse.
- E : Ne suit pas ou s'éloigne.

Test de contrainte

- A : Lutte vigoureusement, se débat et mord.
- B : Lutte vigoureusement.
- C : Se débat, puis se laisse faire.
- D : Ne bouge pas, lèche les mains.

Test de dominance sociale

- A : Bondit, donne des coups de patte, mord et gronde.
- B : Bondit, donne des coups de patte.
- C : Se tortille, lèche les mains.
- D : Se met sur le dos, lèche les mains.
- E : S'éloigne et ne revient pas.

Test de dominance en élévation

- A : Se débat énergiquement, mord et gronde.
- B : Se débat beaucoup.
- C : Se débat, se calme et lèche les mains.
- D : Ne bronche pas et lèche les mains.
- E : Fait le total des A, B, C, D, E.

Résultats et interprétations

- 2 A ou plus avec des B par ailleurs : le chiot réagit agressivement et peut mordre si on le manipule sèchement. Il est à déconseiller pour les foyers qui comptent de jeunes enfants ou pour les personnes âgées. Il lui faudra un environnement calme, avec des adultes, où il jouera le rôle de gardien. Ce type de chien est à éduquer fermement et patiemment, sans punitions physiques.
- 3 B ou plus : le chiot montre une tendance à la domination loyale, à l'assurance. Cela indique une forte aptitude au dressage et un bon comportement dans les concours de travail. Ces sujets sont à déconseiller dans les foyers où vivent de jeunes enfants.
- 3 C ou plus : le chiot est adaptable à tout environnement. Il sera un compagnon parfait pour les enfants et les personnes âgées.
- 2 D ou plus, surtout un E ou plus : le chiot, hypersensitif, a un grand besoin de compliments. Il doit être élevé avec affection pour avoir confiance et se livrer pleinement en milieu humain. Normalement il s'aise avec les enfants. Il ne mord que s'il est maltraité, pour se défendre.
- 2 D ou plus avec un E en dominance sociale : chiot difficile à socialiser sans un dressage faisant appel à une technique spéciale. S'il y a des A ou des B en plus, il peut attaquer par peur, notamment si on le punit. S'il y a C ou D en plus, il deviendra timide ou peureux au moindre traumatisme. Il s'entend mal avec les enfants.
- Un mélange de notes A et E, bornes et mauvaises : il faut recommencer le test car le chiot a montré des comportements imprévisibles.

(D'après les éléments fournis par le Centre Fido Conseil)



La contrainte.

Initiative populaire pour l'interdiction des races de chiens d'attaque et autres chiens dangereux

Les chiens dangereux, ça suffit !

Annexe 2

Les chiens de races dites d'attaque ainsi que d'autres races jugées dangereuses sont chaque année la cause de graves blessures, voire de décès, dont les victimes sont le plus souvent des enfants.

La sélection génétique, ou comment l'homme fabrique des monstres

Ces races ont été créées de toutes pièces par l'homme, par la sélection génétique de caractéristiques d'agressivité ou même de certaines aberrations ou tares comportementales (A. Schleger). De même sont sélectionnées des caractéristiques morphologiques, dont la forme et la puissance de la mâchoire (plusieurs fois plus puissante que celle d'un chien normal), ainsi que la masse musculaire. Ces différentes caractéristiques rendent les chiens concernés intrinsèquement très dangereux, indépendamment de l'éducation ou du dressage qui peut leur être donné (bon ou mauvais).

Une arme ou un animal de compagnie ?

Si l'homme a créé ces races pour en faire des chiens de combat ou pour en faire des armes, quelquefois destinées à la guerre, il a su à l'inverse créer des races sociables et pacifiques, destinées à des tâches d'assistance (chiens d'aveugles et d'infirmités) et de sauvetage ou simplement d'agrément ou de compagnie. C'est évidemment ces derniers qui sont adaptés à la vie en société (humaine) et au cadre familial, moyennant – il va sans dire – une éducation appropriée ainsi qu'une connaissance du comportement et des besoins du chien. Ces conditions assureront une relation harmonieuse entre l'être humain et l'animal.

Quel maître pour quel chien ?

De même que certains chiens sont inadaptés à la vie en société ou à une trop grande proximité avec l'être humain, certains humains se montrent incapables de s'occuper de leur animal, de l'éduquer et d'en avoir la maîtrise. Cette situation peut se révéler particulièrement catastrophique quand des individus instables, immatures et irresponsables choisissent des chiens de races dangereuses pour se donner de l'assurance ou pour intimider; la récente et tragique actualité vient de nous le rappeler.

En conséquence, l'interdiction des chiens dangereux s'impose. De plus, quelles que soient les aptitudes du maître, il est nécessaire que celui-ci possède un bagage minimum en matière de soins et d'éducation et de psychologie canines.

Pour que le chien reste « le meilleur ami de l'homme »

Il est indispensable de favoriser chez le chien l'expression de caractères génétiques de sociabilité, et d'éviter de cultiver ou de transmettre des gènes porteurs d'agressivité pouvant le rendre dangereux. Dans certaines banlieues françaises, par exemple, on observe hélas que depuis l'interdiction des pitbulls, certains les croisent avec des labradors (race paisible et pacifique) pour rendre ces derniers agressifs et combattifs.

Ce n'est pas aimer et respecter les animaux que d'en faire des monstres en manipulant leur patrimoine génétique.

Aimer les chiens, en revanche, c'est veiller à ce que chacun d'eux jouisse d'une bonne éducation et de conditions de vie basées sur la compréhension de ses besoins et de sa nature.

Vous pouvez soutenir l'initiative par un don au CCP 17-188216-9

« Initiative pour l'interdiction des chiens dangereux »

Ou en adhérant au comité de soutien à : case postale 2678 1211 Genève 2

Ou par e-mail: Initiative.chiensdangereux@yahoo.fr

Annexe 3

Mesdames et Messieurs, nous sommes heureux de vous annoncer le dépôt tout à l'heure de notre initiative munie de 13 318 signatures.

Cette récolte contrariée par les conditions météorologiques, s'est essentiellement déroulée du 23 mars au 5 mai.

Elle a été émaillée de 4 agressions, dans trois cas, nous avons du faire appel à la force publique, une agression physique a fait l'objet d'une plainte pénale.

Une campagne orchestrée par les adversaires de l'initiative a tenté de faire passer celle-ci pour une initiative anti-chiens, voire anti-animaux, autour de slogans infantiles et réducteurs mille fois répétés, tel que: "c'est pas les chiens qui sont dangereux, c'est les maîtres" ou "non au racisme canin".

Slogans surtout destinés à occulter la part génétique du problème, ce qui fait précisément la particularité de ces chiens, créés de toutes pièces par l'homme par la sélection de caractéristiques génétiques d'agressivité ainsi que de caractéristiques morphologiques concernant la forme et la puissance de leurs mâchoires, qui caractérisent leur **dangereusité**.

Pour ce qui est de l'agressivité, hormis le facteur strictement génétique, il faut bien sûr relever que d'autres facteurs jouent un rôle important: d'une part les conditions de développement et de socialisation du chien, ses conditions de vie, et d'autre part le type d'éducation ou de dressage qui lui aura été donné.

A toutes fins utiles rappelons une fois encore que toutes les races de chien ont été créées par l'homme à partir de canidés sauvages principalement du loup.

La diversité actuelle des races n'est que le résultat d'un long processus de sélection effectué au cours des millénaires, portant sur des caractéristiques génétiques morphologiques et comportementales, en fonction des besoins de l'homme et des qualités qu'il attendait du chien. (Chiens de combat, de chasse, de berger, d'assistance etc.)

Ce qui est en jeu aujourd'hui et ce qui a motivé notre initiative, est un problème de sécurité publique dû à la prolifération de chiens agressifs et dangereux répondant à un phénomène de mode, qui concerne des gens possédant un chien comme une arme plutôt que comme animal de compagnie.

Pour palier à cette situation, il nous paraît indispensable d'agir sur trois axes différents:

1.- La génétique du chien

En favorisant l'expression de caractères génétiques de sociabilité, et en interdisant de cultiver et de transmettre des caractères génétiques d'agressivité ainsi que des caractéristiques morphologiques impliquant une plus grande dangereusité (forme et puissance de la mâchoire).

Il ne faut plus ni produire ni commercialiser de chiens dangereux !

2.- L'information et la formation des maîtres

Afin que ceux-ci possèdent un bagage minimum en ce qui concerne la nature et les besoins de leur animal, les soins et l'éducation indispensables à l'équilibre et à la maîtrise du chien en toutes circonstances.

Un chien ça se mérite !

3.- Les conditions de développement, de détention et l'éducation du chien

Ne pas enlever trop tôt le chiot à sa mère afin de permettre l'apprentissage de l'inhibition de la morsure.

Favoriser l'imprégnation ou la socialisation du chiot à l'humain.

Lui donner des conditions de vie lui assurant un bon équilibre ainsi qu'une éducation qui garantisse des rapports harmonieux avec ses congénères ainsi qu'avec les humains.

Nous voyons donc que les éleveurs portent une grande responsabilité quant au caractère du chien, tant en ce qui concerne le choix des reproducteurs, qu'en ce qui concerne les conditions de développement du chiot.

Les éleveurs peuvent donc faire évoluer une race vers plus ou moins de sociabilité ou d'agressivité.

Pour ce qui concerne le **projet de loi sur les conditions d'élevage, d'éducation et de détention de chiens M 3 45** ainsi que le **règlement transitoire du 5 avril 2006**.

Dans l'exposé des motifs nous observons:

1.- que contrairement à ce que laisse supposer le texte nous ne proposons aucune liste de chiens dangereux et en laissons l'entière responsabilité au seul Conseil d'Etat, mais qu'en tout état de cause seule une interdiction des races aujourd'hui considérées comme dangereuses est en mesure d'assurer la sécurité publique.

2.- qu'il est faux de considérer toutes les morsures comme ayant le même degré de dangerosité, et qu'il faut bien distinguer deux types de morsures totalement différentes tant dans leurs causes que dans leurs gravités:

Premièrement la morsure "sanction", conséquence d'un comportement inapproprié de l'humain vis-à-vis du chien, c'est une morsure généralement (en fonction de la race du chien) de moindre gravité.

Deuxièmement la morsure "prédatrice", due à un comportement prédateur et totalement désinhibé du chien, sans que la victime n'ait eu aucune interaction avec l'animal, c'est souvent une morsure multiple et d'une extrême gravité.

Il est enfin évident qu'une morsure de Pitbull n'aura pas la même gravité que celle d'un Yorkshire, que d'autre part le nombre de morsures par race doit être mis en relation avec le nombre d'individus en circulation, pour que la comparaison soit pertinente.

3.- Une quantité non négligeable de chiens ne sont déjà pas déclarés et échappent de ce fait à l'impôt ainsi qu'à tout contrôle. Nous devons donc nous doter de moyens de contrôle efficaces, et pouvoir appliquer des sanctions dissuasives.

En ce qui concerne l'**article 3A** du projet de loi:

Nous considérons prioritaire en termes de sécurité publique, d'interdire la transmission ou la perpétuation de caractères génétiques d'agressivité et de dangerosité.

Répétons-le, sauf à l'usage éventuel des services de police et des douanes, il ne faut plus ni produire ni commercialiser de chiens dangereux !

En ce qui concerne l'**article 7A** du projet de loi:

Nous ne voyons aucune raison pertinente en dehors des forces de l'ordre d'autoriser la possession de chiens dangereux, achetés ou utilisés comme arme, dans le but d'impressionner ou d'intimider, comme ça pourrait être le cas par le port d'une arme à la ceinture.

Nous ne devons pas minimiser le stress ressenti par les gens exposés à ce genre de situation, d'autant que cela contribue également à l'escalade de la violence.

En outre, contrairement au projet de loi, notre initiative préconise pour les chiens d'un poids supérieur à 25 Kg, présentant de ce fait un danger potentiel, un examen destiné à évaluer le comportement de l'animal et la capacité du détenteur à le maîtriser en toutes circonstances.

«Des spécialistes autoproclamés manipulent les autorités»

En Suisse, on ne veut pas se donner les moyens statistiques de mesurer quelle sorte de chien est plus dangereuse qu'une autre. Tout le problème est là, regrette Martin Killias, professeur à l'Institut de criminologie de l'Université de Lausanne.

Pourquoi est-il si difficile d'interdire les chiens molossoides en Suisse? En France, on a pu s'en passer, non?

C'est difficile parce que, en Suisse, la démocratie directe a pour corollaire des procédures de consultation. Or les milieux en question tendent à «squatter» les organisations ordinaires lors des procédures de consultation. Un secrétaire de parti politique n'est souvent pas en mesure de se prononcer sur tous les détails techniques de certains objets très spécifiques et sera de ce fait tout heureux de «déléguer» cette tâche à un «spécialiste» qui souvent est un lobbyiste. C'est ce qui se passe pour les chiens et, depuis des années, c'est ce qui se passe en matière d'armes à feu. Dans les deux cas, des lobbies très bien organisés ont su contrecarrer des législations en préparation, souhaitées par une écrasante majorité de la population. La responsabilité première dans la situation actuelle ne relève pas des milieux politiques, mais des spécialistes (souvent autoproclamés) qui manipulent les autorités en arguant, par exemple, qu'il était «scientifiquement» inapproprié d'interdire certaines races, ou que «toutes» les races de chiens représentaient le même risque.

Dans le débat sur l'interdiction, les propriétaires de pitbulls arguent que leur chien à eux est gentil. Est-ce suffisant?

Sur le fond, ce qui nous fait défaut dans le débat, ce sont des statistiques bien faites. Comme professeur dans un domaine où il y a de questions de sécurité, j'ai l'habitude de développer des données statistiques, cela dans l'intérêt d'un débat fondé sur une base de discussion saine. Ces statistiques ne donnent pas les réponses mais permettent de faire les choix politiques. Définir quelles races de chiens sont dangereuses et dans quelle mesure elles le sont, c'est le rôle des



MARTIN KILLIAS Le criminologue stigmatise le poids des lobbies prochiens en Suisse.

experts. Dire à quel degré de dangerosité ces chiens doivent être interdits, c'est une question politique que tout citoyen est appelé à trancher dans une démocratie. Quand la dangerosité n'est pas «absolue» mais probabiliste, comme pour certaines substances toxiques, la réponse n'est pas oui ou non, noire ou blanche, mais porte sur différentes tonalités de gris. C'est la même chose pour les chiens:

personne ne conteste qu'il y a des pitbulls gentils, mais dans leur ensemble, combien de fois sont-ils plus dangereux que la moyenne des chiens? Cinq fois, dix fois plus? Ces réponses, nous ne les avons pas, car il nous manque les données tant pour le numérateur que pour le dénominateur.

C'est-à-dire?

Au niveau du numérateur, il faudrait connaître le taux de morsures exact, et cela selon leur degré de gravité. Car une banale morsure, ce n'est pas la même chose qu'une jambe ou un visage déchirés. Il faudrait aussi savoir si la morsure s'est produite à la maison, chez le propriétaire, ou dans l'espace public. C'est évidemment l'espace public qui pose problème, étant donné que chacun choisit librement les animaux dont il souhaite s'entourer.

Au niveau du dénominateur, il faudrait connaître non seulement les effectifs des différentes races, mais également leurs conditions de détention, soit le nombre de minutes (sur 24 heures) où les chiens se trouvent dehors non attachés et donc en mesure de nuire. Ce «temps à risque» varie très fortement d'une race à l'autre. Les bouviers par exemple ont été accusés d'être les plus «mordeurs» par des gens qui se proclament «scientifiques». Ce condensé d'absurdité s'explique par le fait que ces chiens sont non seulement plus nombreux que les pitbulls, mais aussi qu'ils rôdent toute la jour-

«En muselant tous les chiens dans les parcs, le Conseil d'Etat a fait sienne la position du lobby des molosses qui, précisément, contestait toute possibilité de différencier entre plusieurs races.»



SÜLEYMAN La mort du bambin d'Oberglatt (ZH) et l'émotion qui a suivi sont à l'origine des débats actuels sur les chiens de combat.



AMERICAN STAFFORDSHIRE Ce chien a tué une fillette de 17 mois à Gennevilliers cet été, entraînant les mesures draconiennes dites Sarkozy.

née autour des fermes, en principe en liberté et donc en contact avec des promeneurs. Leur potentiel de nuisance est logiquement incomparable à celui d'un pitbull qu'aucun propriétaire raisonnable ne laisserait vagabonder. En résumé: il faudrait idéalement une statistique du nombre de morsures, hiérarchisées selon leur gravité et commises dans l'espace public en fonction de la durée que les chiens de différentes races passent à l'extérieur.

Quel est le principal avantage d'une telle vision statistique?

De telles données permettraient une comparaison plus adéquate pour prendre des mesures. Notre institut avait d'ailleurs proposé en 1999 à l'Office vétérinaire fédéral d'inclure, lors du sondage national de victimisation de l'an 2000, quelques questions sur les morsures et les expériences des 4000 répondants. Nous pensions à la peur envers certains chiens, à la possession de chiens (et de quel type) et à leur encadrement (soit le «temps à risque»). Le budget articulé à l'époque était très modeste, de l'ordre d'environ 20 000 francs. Mais l'Office vétérinaire n'en a pas voulu, ce qui fait que nous n'avons pas de données pour mener un débat sain.

Les statistiques bâloises qui recensent les événements dans l'espace public montrent qu'une toute petite minorité des chiens (moins de 5% de la population canine) est responsable de plus de la moitié des accidents dans l'espace public. Cette distribution forte inégale ressemble beaucoup à ce que l'on trou-

«Les autres animaux sont les premières victimes des chiens agressifs. Aussi, je ne comprends pas les protecteurs des animaux défendant les chiens dangereux.»

ve dans le domaine de la criminalité ou moins de 10% des jeunes sont responsables de plus de 70% des infractions graves. Avec une telle vision statistique, vous n'allez pas menotter tout le monde, mais focaliser votre action sur la minorité qui fait problème.

Justement, faut-il faire un lien entre le chien dangereux et le profil criminel de son propriétaire: toxicomane, proxénète, dealer, petit caïd?

Chacun peut constater dans les rues l'augmentation du nombre des molosses. Car le chien, entre autres fonctions, sert aussi à affirmer l'ego du maître, il est un attribut de pouvoir. Je trouve cependant dangereux de localiser le problème exclusivement au niveau de l'homme détenteur, car l'un comme l'autre, l'homme et son chien, peuvent être dangereux. Comme c'est toujours l'homme et l'arme qui tuent. Changer l'homme est cependant bien plus difficile que de supprimer l'arme – ou le chien.

Les calculs de probabilité des risques fondent le principe de précaution. Dans le débat sur les chiens, même les lobbies canins admettent que tout chien peut mordre. Dès lors, faudrait-il interdire les chiens?

On peut concevoir une société sans chiens, même si personnellement je n'y adhèrerais pas. Typiquement,

voilà une question politique. Dans certaines sociétés, les chiens sont rarissimes, par la tradition plus que par la loi, comme au Japon par exemple. L'argument que tous les chiens sont dangereux est sans doute juste, mais tout aussi absurde que de dire qu'il faudrait enfermer tous les êtres humains sous prétexte qu'ils pourraient tous un jour devenir dangereux. Comme en matière de criminalité, il faudrait donc focaliser l'action sur les groupes qui sont impliqués dans des incidents dans une proportion clairement disproportionnée.

Début janvier, l'Office vétérinaire fédéral a voulu prendre des mesures pour prévenir les accidents. La plupart des offices cantonaux s'y sont opposés. Comment expliquer une telle différence d'attitude?

Nouvelle comparaison avec le lobby des armes, deux sujets fantastiquement semblables! Les spécialistes chargés des contrôles sont souvent assez proches du milieu qu'ils doivent contrôler. Il en va de même des vétérinaires cantonaux qui ont des liens très étroits avec les milieux cynologiques. C'est une évidence: à notre époque, le bétail diminue et le vétérinaire s'occupe davantage des chiens et des chats. C'est aussi sa source de revenus.

24 ÉVÉNEMENT

L'HEBDO 31 AOÛT 2006



PÉTITION Werner De Schepper, rédacteur en chef du *Blick*, remettant les 175 000 signatures anti-molosses à Joseph Deiss en décembre 2005.



GENÈVE EN FOLIE Conférence de presse surréaliste le 21 août dernier, avec trois membres du gouvernement pour parler des chiens.

Le Conseil d'Etat genevois a-t-il récemment pris une décision cohérente?

En muselant d'abord tous les chiens dans les parcs, le Conseil d'Etat a fait sienne la position du lobby des molosses qui, précisément, contestait toute possibilité de différencier entre plusieurs races. En restreignant d'autre part l'obligation de porter la muselière aux seuls chiens appartenant à une race figurant sur une liste, il a implicitement admis qu'une telle différenciation était possible et se justifiait. Sur ce point, on peut le suivre sans réserve. Le problème, c'est que le deuxième volet est en flagrante contradiction avec la vision qu'il n'y aurait pas de différence entre les races, vision qui inspire le premier volet.

Les incohérences dont vous parlez risquent-elles de se reproduire ailleurs en Suisse?

C'est difficile à dire. Personnellement, je serais bien plus heureux si les autres cantons focalisaient leur action sur les races qui visiblement représentent un risque disproportionné, même s'il est difficile à ce jour de chiffrer leur «dangerosité accrue».

La notion de race, on le voit, est au centre du débat. Mais de quoi parle-t-on?

La signification sociale du mot race est un aspect central. Dans notre société, personne ne veut être raciste. Mais il faut poser la question: pourquoi est-il illégitime d'être raciste entre humains? Parce que chez les humains, la procréation n'est pas décidée selon des critères adoptés par le pouvoir, et l'homme ne choisit pas son ou sa partenaire dans le but d'améliorer la race. En revanche, l'homme sélectionne le sperme des taureaux et l'insémine dans des millions de vaches. Les animaux d'élevage sont donc le produit d'une sélection extrêmement poussée. Pour certains animaux, tels les chiens et les chevaux, la sélection se joue sur des traits de caractère autant que sur des qualités physiques. Pour certaines races de chiens, le caractère agressif de l'animal est un élément de reproduction important. Dès lors, si l'homme est à l'origine de ces races, il devrait pouvoir décider de revenir en arrière s'il observe des dérives, non?

Faudrait-il un permis pour tous les chiens?

Cela entraînerait une incroyable paperasse bureaucratique et des coûts absurdes pour l'Etat. Faire

passer des tests d'aptitude à tout le monde, même au pékinois de grand-maman soumise aux cours de dressage, quel dérapage! Il faut se concentrer sur le petit pourcentage de chiens représentant des risques disproportionnés. Personnellement, je penche pour l'approche valaisanne: interdire certaines races et contrôler les conditions de détention pour une catégorie limitée de chiens de grande taille qui ont un potentiel de nuisance moyen à élevé.

Des cours de dressage seraient donc inutiles?

Ils permettent de mieux contrôler l'animal, mais aucun dressage n'est efficace à 100%, un chien n'étant pas un appareil que l'on peut programmer. Surtout les chiens sélectionnés justement pour leur caractère agressif.

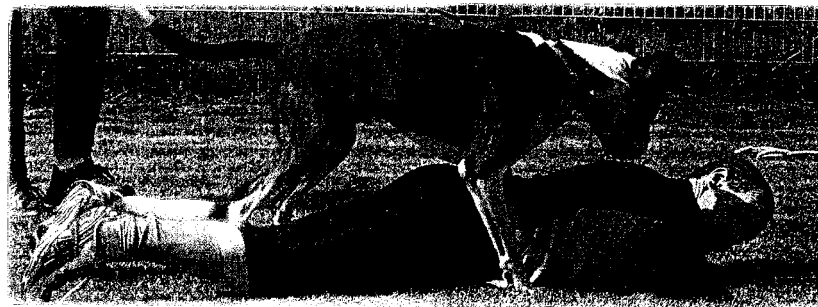
On parle du danger pour les humains, mais il y a aussi les risques pour les autres animaux...

Absolument. On le sait bien, les chiens sont les premières victimes des chiens agressifs, au même titre que les chats. En ce sens, je ne comprends pas les protecteurs des animaux défendant les chiens dangereux qui souvent infligent d'horribles douleurs à leurs congénères.

Sans loi fédérale, va-t-on se retrouver une fois de plus avec des régimes cantonaux?

Oui, mais ce ne serait pas ingérable. On dit souvent que prohibition et contrôles engendrent un marché noir, ce qui est probable lorsqu'une demande est inélastique, comme celle pour les drogues dures. Mais le souhait de posséder un chien dangereux n'est sans doute pas aussi compulsif,

«Faire passer des tests d'aptitude au pékinois de grand-maman, quel dérapage! Il faut se concentrer sur le petit pourcentage de chiens représentant des risques disproportionnés.»



JULY PERRY / KESTONE

DRESSAGE «Ces cours permettent de mieux contrôler l'animal, explique le professeur Killias, mais aucun dressage n'est efficace à 100%, un chien n'étant pas un appareil que l'on peut programmer...» Ici, des tests d'éducation poussés en Allemagne, près de Hambourg.

«Si l'homme est à l'origine de ces races de chiens, il devrait pouvoir décider de revenir en arrière s'il observe des dérives, non?»

et l'on s' imagine mal que l'on puisse garder un chien interdit chez soi sans que cela se remarque tôt ou tard. En revanche, le contrôle de l'élevage, préconisé par «Berne», sera très facile à déjouer, les frontières dans l'Europe de Schengen étant de toute évidence de moins en moins étanches.

Avant qu'une loi cohérente ne passe faut-il attendre de nouvelles victimes?

C'est à craindre, mais ce n'est pas l'intérêt des gens qui aiment les chiens. En Italie, pays d'origine des pitbulls d'Oberglatt, on a toléré tous les trafics et dérapages. Et voilà que la société réagit de manière hystérique, avec des laisses et une muselière obligatoires sur les piazzas des villes... Il m'est arrivé d'être éjecté du bus parce que mon petit teckel était sans muselière. Ça, c'est le prix qu'il faudra payer si l'on

continue à tolérer les races dangereuses et les croisements qui font augmenter la dangerosité moyenne du «cheptel» de chiens. On verra alors se multiplier les interdictions dans l'espace public, en ville comme en forêt. Cette perspective-là, les milieux cynologiques l'évacuent totalement. La muselière à tous les chiens dans les parcs genevois donne un avant-goût aux propriétaires de chiens «normaux» de ce qui leur arrivera s'ils persistent à tolérer l'action de leurs organisations et de certains vétérinaires qui continuent à défendre les races les plus indéfendables. I

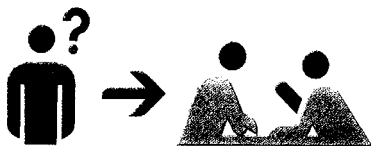
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Morsures de chien en Suisse – une étude scientifique

Ursula Horisberger, vétérinaire, auteur de l'étude

Les accidents par morsure de chien font partie du revers de la médaille de la relation entre l'être humain et le chien. Plusieurs accidents graves ont attiré l'attention d'un large public sur cette problématique et divers milieux cherchent à la fois des moyens et des solutions permettant de réduire les risques de ces accidents.

Le **Groupe de Travail Chiens Dangereux¹** (GTCD) a été constitué en 1999 sur initiative de l'Association Vétérinaire Suisse pour la Médecine Comportementale (AVSMC). L'objectif du GTCD est d'élaborer et de promouvoir des mesures de prévention des accidents par morsure de chien. Pour mettre en place une prévention efficace, il est nécessaire de connaître les *groupes à risque* (victimes et chiens) et les *situations à risque*. Constatant le manque de données précises sur les chiens et sur les situations dans lesquelles les accidents surviennent, un état de fait valable pour la Suisse comme pour les autres pays, le GTCD a initié une étude dont les résultats sont désormais disponibles².

Les enfants courent plus de risques que les adultes

Près de 300 médecins de famille représentatifs et 70 hôpitaux ont participé à l'étude. Entre septembre 2000 et août 2001, ils ont recensé les cas des patients qui ont eu recours à une consultation médicale dans le cabinet ou à l'hôpital suite à une morsure de chien. Les indications relevées concernent la victime, le chien mordeur et la situation dans laquelle l'accident est survenu. Une fois extrapolés, les résultats de l'étude permettent d'affirmer que le nombre de patients ayant recours à une consultation médicale en cabinet ou à l'hôpital suite à une morsure de chien avoisine les 13 000 par année, ce qui correspond à une incidence de 180 cas par année pour 100 000 habitants.

Les enfants courent un plus grand risque d'être blessés par un chien que les adultes : dans cette étude, les enfants ont fait l'objet de deux fois plus de consultations dans les hôpitaux. Ils souffrent également d'autres types de blessures : les enfants, et plus particulièrement les plus jeunes, souffrent principalement de blessures à la tête alors que les blessures des adultes concernent en premier lieu les extrémités (bras, mains et jambes).

Blessures à la tête et aux mains : les conséquences sont plus lourdes !

22 % des *patients soignés à l'hôpital* l'ont été sous anesthésie : leurs blessures ont été qualifiées de « blessures plus graves ». Ce sont principalement les blessures à la tête et aux mains qui se révèlent être des « blessures plus graves » (46 % et 23 %). 7,5 % des patients des hôpitaux ont été hospitalisés ; les personnes blessées à la tête sont celles qui sont le plus souvent hospitalisées (23 %). D'une manière générale, les enfants – le groupe présentant le plus de blessures à la tête – souffrent plus souvent de blessures graves et ils sont aussi plus souvent hospitalisés.

¹ Le GTCD est composé de représentants des organisations suivantes : Association Vétérinaire Suisse pour la Médecine Comportementale (AVSMC), Société des vétérinaires suisses (SVS), Association suisse pour la médecine des petits animaux (ASMPA), vétérinaires cantonaux, Protection Suisse des Animaux (PSA), Société Cynologique Suisse (SCS), Fondation pour le bien-être du chien, Faculté de médecine vétérinaire de l'Université de Berne, Office vétérinaire fédéral (OVF).

² Ursula Horisberger: « Accidents par morsure de chien suivis d'une consultation médicale; victimes – chiens – situation au moment de l'accident », thèse de doctorat, Faculté de médecine vétérinaire de l'Université de Berne et Office vétérinaire fédéral OVF, 2002.

Principal groupe à risque : les propriétaires de chien(s)

24 % des victimes ont été mordues par leur propre chien, 34 % par un chien qu'elles connaissaient et 42 % par un chien qui leur était inconnu. Les enfants ont été plus souvent mordus par un chien qu'ils connaissaient. Les $\frac{3}{4}$ des blessures à la tête et aux mains, c'est-à-dire des blessures qui sont souvent lourdes de conséquences, ont été occasionnées soit par le chien de la victime soit par un chien que celle-ci connaissait.

Selon les résultats d'une étude de marché, on estime que 15% des Suisses vivent avec un chien. Si l'on met ce chiffre en parallèle avec les 24% des blessures occasionnées par le propre chien de la victime, on obtient le résultat suivant : par rapport aux non-propriétaires de chien, les propriétaires de chien(s) courent un risque au moins deux fois supérieur de se faire mordre.

Enfants : prudence lors d'interactions avec des chiens !

Les différentes situations dans lesquelles les accidents surviennent peuvent être classées dans trois catégories différentes :

- Situations liées à une *bagarre entre chiens* (p. ex. essai de séparer les chiens)
- *Interactions* avec le chien (p. ex. caresser, jouer, brosser, soulever, mettre la laisse, punir, etc.)
- Situations *sans interaction* (croiser le chien à pied ou à vélo, accéder à un terrain, etc.)

Les accidents causés par le propre chien de la victime ont principalement lieu à l'occasion d'une interaction avec le chien ou d'une bagarre entre chien (68 % et 20 %). En revanche, selon le témoignage des victimes, 69% des accidents dus à des chiens inconnus sont survenus sans interaction préalable.

Une fois de plus, des différences sont apparues entre les enfants et les adultes : les enfants sont plus souvent blessés à l'occasion d'interactions avec le chien que ne le sont les adultes (58 % et 33 %) ; en ce qui concerne les plus jeunes, entre 0 et 4 ans, ce sont 82% des accidents qui se sont produits lors d'une interaction avec le chien. Comparés aux adultes, les enfants ont plus d'interactions non seulement avec leur propre chien mais également avec des chiens de leur entourage et avec des chiens inconnus. Il convient aussi de remarquer que 20% des accidents dont les adultes ont été les victimes ont eu lieu pendant des bagarres entre chiens.

Enfants:

- sont *plus souvent* blessés.
- localisation principale: *la tête*.
- les *conséquences* des blessures à la tête sont généralement *plus graves*.
- les enfants sont plus souvent mordus par des *chiens qu'ils connaissent*
- les accidents surviennent souvent à l'occasion d'une *interaction* avec le chien.

Adultes:

- sont *plus rarement* blessés.
- localisation principale: *les extrémités*.
- les *blessures lourdes de conséquences* sont principalement celles qui concernent *la tête et les mains*.
- ces dernières sont souvent consécutives à une *interaction* avec le chien ou à une *bagarre entre chiens* et elles sont souvent dues au *propre chien de la victime* ou à un chien que celle-ci connaît.

Chiens avec même indication de race : un groupe hétérogène !

Pour pouvoir se prononcer sur les chiens mordeurs, il est indispensable de pouvoir les comparer à la population canine suisse (fréquence des différentes races, âge, sexe, etc.). Ces données n'étant pas disponibles pour la Suisse, elles ont tout d'abord dû être saisies. Les données de 13 cabinets vétérinaires représentatifs et de trois cantons (GR, NE, AR), de même que les données relatives aux inscriptions au Livre suisse des origines (LOS) de la Société Cynologique Suisse (SCS) ont permis d'estimer la composition de la population canine suisse.

Seuls 25% des chiens suisses sont des chiens de race avec pedigree reconnu par la Société Cynologique Suisse (SCS) ; cependant 70% des chiens sont désignés par leur propriétaire comme appartenant à un type de race défini. Seuls 30 % sont donc considérés comme des « croisés ». Les chiens désignés comme appartenant à un seul type de race défini constituent par conséquent un groupe très hétérogène ; en effet, seul un tiers d'entre eux serait en fait des chiens de race au sens propre du terme.

Les types de races les plus fréquents en Suisse sont le type berger (berger allemand, bergers belges et les chiens définis comme « bergers » par leur propriétaire) suivi du type labrador/golden retriever et du type regroupant les chiens de bouvier suisses.

Les chiens ne mordent pas tous de la même manière

Si l'on compare les données relatives à la population canine suisse aux données relatives aux chiens qui ont occasionné des blessures suivies d'une consultation médicale, il apparaît que les petits chiens sont en général à l'origine de moins d'accidents. De plus, les petits chiens sont moins souvent à l'origine de blessures graves. Il faut cependant remarquer que les jeunes enfants (de 0 à 4 ans) sont aussi souvent blessés par des petits chiens que par des chiens de plus grande taille. Dans l'ensemble, les chiens mâles mordent trois fois plus souvent que les chiennes.

Il n'est pas apparu de différence en ce qui concerne la fréquence des accidents par morsure dus à des « croisés » d'une part, et dus à des chiens appartenant à un type de race défini d'autre part. Ce sont les types de races les plus fréquents qui sont à l'origine du plus grand nombre d'accidents. Indépendamment de cet état de fait, certains types de races sont surreprésentés dans la catégorie des mordeurs par rapport à leur fréquence dans la population canine suisse ; les chiens du type berger et ceux du type rottweiler en font partie. Les chiens des types retriever (labrador et golden) et yorkshire-terrier sont quant à eux sous-représentés dans la catégorie des chiens qui ont provoqué des blessures nécessitant une consultation médicale. Il est intéressant de constater que cette observation sur le type retriever n'est pas valable en ce qui concerne le milieu familial du chien. Dans la catégorie des chiens ayant blessé leur propriétaire, la position des chiens du type retriever se situe dans la moyenne. Un phénomène du même genre mais avec une inversion des résultats peut être constatée pour les chiens de type chien de bouvier suisse : ils sont dans la moyenne pour ce qui est des accidents par morsure en général mais ils sont cependant clairement surreprésentés en ce qui concerne les blessures provoquées par des chiens étrangers à la victime.

Ces observations laissent supposer que différents facteurs pourraient jouer un rôle important au niveau de l'incidence des accidents par morsure de chien : l'image que le propriétaire a de son chien, l'utilisation du type de chien (chien de ferme, chien de garde, chien de défense, chien de compagnie, etc.) et les conditions de vie du chien.

Conclusion : trois groupes cibles pour la prévention

Tant en raison du risque plus élevé d'être mordu par un chien que de la responsabilité qui leur incombe, on peut définir trois groupes comme étant le public cible d'une prévention efficace :

Les propriétaires de chien(s) :

- risque élevé
- les accidents ont principalement lieu à l'occasion d'une interaction avec le chien ou d'une bagarre entre chiens
- les blessures concernent souvent les mains → blessures plus graves
- sécurité publique : le propriétaire du chien est généralement présent lorsque son chien mord un inconnu

Les enfants et leurs parents :

- les enfants sont plus souvent mordus que les adultes
- localisation principale : tête → blessures plus graves
- les enfants, et plus particulièrement les plus jeunes, qui sont principalement blessés lors d'interactions avec les chiens, ne sont pas encore en mesure de contrôler leurs interactions avec un chien ni de prévoir l'agression de ce dernier → Rôle des parents !
- les enfants sont les adultes demain

Les éleveurs de chiens au sens large du terme :

Ils et elles portent la responsabilité d'élever des chiens qui sont en mesure de s'adapter à la société et doivent donc :

- sélectionner les géniteurs : but d'élevage
- préparer les chiots à leur vie future (environnement de l'élevage / contacts sociaux)
- choisir et conseiller les futurs acquéreurs.

ANNEXE 3

MORSURES DE CHIEN CHEZ L'ENFANT



Genève, mars 2007, Dr. N. Costantini Wolff, Chirurgie Pédiatrique, HUG

Epidémiologie Généralités

Morsures:

- 80-90 % chiens
- 5-15 % chats
- 2-3 % homme
- < 1% autres espèces domestiques ou sauvages (rongeurs, chevaux, vaches,...)

Morsures de chien

Incidence des morsures/100000hab/an:

- USA 1800
- Canada 364
- E 100
- F 50 (que population ped 0-15 ans)

Epidémiologie (2) en Suisse

Morsures : 195/100'000 habitants (60 % enfants)

- 1 % consultations en urgence
- 5 % hospitalisations en urgence (enfants + adultes)

Population canine:

En Suisse:
490'000 chiens (1 chien/15 hb et 0.08 chiens/km²)

A Genève:
32'000 à Genève (1 chien/14 hb et 129 chiens/km²)

Epidémiologie (2) en Suisse

	Suisse	Genève
Chiens	490'000	32'000
Surface [km ²]	41'285	249 (sans lac)
Habitants	7'500'000	440'000
Chiens/km ²	0,08	129
Chiens/hab	15	14

Epidémiologie (3)

- Consultations en urgence:
 - USA 1:200 (0.5%)
- Hospitalisations en urgence:
 - USA: 4 %
- Coûts:
 - direct (prise en charge) USA: 164.9 mio US/an
 - indirects (perte de gain) USA: 89 mio US/an

Dispositif modifié

Epidémiologie (4)

Etude pédiatrique à Genève (2000-2001):

n: 41 Enfants, sex ratio G/F 1.2

Prise en charge:

- 68 % ambulatoire
- 32 % hospitalisation en moyenne de 4 jours (2-10 jours)
- 0 % admissions aux soins intensifs
- 0 % décès

Follow-up:

87 % des enfants $\Rightarrow$ 42% $\geq$ 3 fois

Epidémiologie (5)

Etude pédiatrique à Genève (2000-2001):

✓ 54 jours d'hospitalisation

(moyenne 3.9 j/enfant; range 2-10)

✓ 97 consultations

(moyenne 2.3 consultations/enfant; range 1-7)

Total coûts directs $\Rightarrow$ CHF 109'131.70

Coûts	CHF/enfant	CHF (Total)
Hospitalisation	2'307.00	99'200.00
Ambulatoire	242.25	9'931.70
Total	2'549.25	109'131.70

Morsures des chiens (1)

Age:

- ✓ moyenne 6 ± 4 ans
- (34 % < 2 ans, 27 % 5 à 6 ans)

Période:

- ✓ 54 % Eté
- ✓ Week-end
- ✓ L'après-midi (18h00-20h00)



Morsures des chiens (2)

Lieu:

- ✓ 60% domicile ou dépendance immédiate (famille, amis)
- ✓ 40 % ailleurs (parcs, rue,...)

80 % Animal connu par le patient (animal appartenant à la famille, voisins,...)

50 % l'accident a lieu en absence de surveillance d'un adulte

Morsures de chien (3)

Chien:

- $\Rightarrow$ 80% males, non castrés, jeunes (12-36 mois)
- $\Rightarrow$ > 50 % > 25 Kg
- $\Rightarrow$ 39% déjà mordu auparavant
- $\Rightarrow$ 53% sans laisse

Activité:

32 % contact entre chien et victime (caresse, jeu)



Morsures des chiens (4)

Circonstances

- ✓ Accident
- ✓ Aggression par peur
- ✓ Aggression par hiérarchie familiale
- ✓ Maladie (douleur, affection neurologique)
- ✓ Femelle avec ses petits
- ✓ Comportement pathologique (chien errant prédateur)



Morsures de chien (4)

53 % tête & cou



Morsures de chien (5)

21 % membres inférieures
15 % membres supérieures
11 % tronc
12 % plaies multiples



Complications (1)

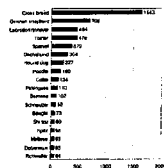
- Hémorragie (cause principale de mort)
- Infection (10 % risque)
- Séquelles esthétiques (avulsions, amputations)
- Séquelles fonctionnelles (SNC, articulaires)
- Stress psychologique

Complications (2)

- Mortalité
 - France: 0-2 cas par an
 - USA: 10-15 cas par an
 - CH: 3 cas dernier 10 ans
 - 50-70 % enfants < 10 a



Distribution canine



Distribution canine en Autriche
sur une population de 6000
chiens.

- Distribution canine en Suisse:
- 25 % chiens de race
 - Bergers (Allemand, belges)
 - Labrador, Golden Retriever
 - Bouvier Suisse

Analysis of Dog Bites in Children Who Are Younger Than 11 Years.

J Schicklen, H Altmann, G Singer, T Puschner, J Puchner. 2006;117:374-379

Incidence des morsures de chien selon la race - 341 enfants 0-16 ans

Dog breed	Dog Bites	Dog Bites %	Dog Population, %	Risk Index
German shepherd	105	34	12	2.87
Cocker spaniel	8	3	1.1	2.71
Sheltie	5	2	1.1	1.81
Border collie	10	3	1.0	1.56
Doberman	22	7	5.2	1.35
Schutzhund	5	2	1.5	1.33
Collie	19	3	2.2	1.30
Border terrier	15	5	3.9	1.29
Poodle	10	3	3.1	1.06
Border terrier	1	1	1.1	0.97
Beagle	3	1	1.2	0.80
Terrier	15	5	8.7	0.61
Border terrier	3	1	1.7	0.58
Labrador retriever	11	4	8.2	0.49
Golden retriever	29	13	28	0.44
Spaniel	5	2	6.5	0.31
Shetland	1	0.3	1.2	0.25
Mixtures	0	0.0	1.1	0.05

Analysis of Dog Bites in Children Who Are Younger Than 11 Years.

J Schicklen, H Altmann, G Singer, T Puschner, J Puchner. 2006;117:374-379

Morsure de chien (12)

Labrador



Prévention morsures des chiens

1. Victimes
2. Propriétaires des chiens
3. Autorités

Prévention morsures des chiens -victimes-

⇒ Eviter tout contact avec l'animal!!

⇒ Ne laisser jamais sans surveillance un petit enfant avec un chien

⇒ Pas toucher un chien inconnu



Prévention -victimes-

Ne pas déranger un chien lorsqu'il

- dort



- Mange



- une femelle avec ses petit

Prévention morsures des chiens (2) -victimes-

- Pas rapprocher deux chiens qui se battent
- Respecter le territoire du chien (couches, écuell)
- Ne pas bloquer toute possibilité de sortie à l'animal



Prévention - victimes-

Education

Apprendre à l'enfant:

- ✓ à reconnaître les signes d'agressivité



Dangerous

- intense stare
- mouth closed
- lowered body posture
- tail straight up



Safe

- panting
- floppy ears/head
- relaxed body posture



Prévention - victimes-

Education

Apprendre à l'enfant:

- ✓ Comment réagir en cas d'attaque



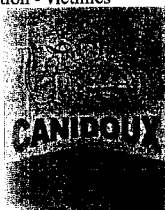
Prévention - victimes-

Education



Prévention - victimes-

Soutien



Prévention morsures des chiens (1)

- Propriétaires des chiens
 - cours de dressage
 - mesures de restriction à la liberté (laisse, muselière)



Prévention morsures des chiens (1)

Autorités

- document d'identité de l'animal (puce électronique)
- limitation des races dangereuses
- signalisation de toute attaque



Prévention morsures des chiens (1)

Autorités

Loi (code pénal Suisse)

Art. 12: Annonce obligatoire

Il appartient au département de justice, police et sécurité, de même qu'aux communes, au corps médical et aux vétérinaires, d'annoncer au département les cas de blessures dues à des morsures de chiens qui parviennent à leur connaissance.

Art. 358ter: Droit d'aviser

Lorsqu'il y va de l'intérêt des mineurs, les personnes astreintes au secret professionnel ou au secret de fonction (art. 320 et 321) peuvent aviser l'autorité tutélaire des infractions commises à l'encontre de ceux-ci.

Prévention morsures des chiens (1)

⇒ sanctions et répression

✓ Amende (CHF 100-1200,-)

✓ Interdiction de tenir des animaux

✓ Séquestres provisoires

- ✓ Séquestres définitifs

- Nouveau propriétaire
- Euthanasie (sécurité publique)



Dog bites in children: costs evaluation in a one year prospective study.

N. Centeno⁽¹⁾, C. Thévenod⁽²⁾, A. Lironi⁽¹⁾, C. Le Coultre⁽¹⁾, G. La Scala⁽¹⁾

(1) Service de Chirurgie Pédiatrique, Hôpital des Enfants, Rue Willy-Donzé 6, CH- 1211 Genève 14

(2) Planification sanitaire qualitative, 20 rue des Caroubiers, CH-1227 Carouge

Introduction: Since the dog population is constantly increasing (in Switzerland it is estimated to be 490'000, which is a 1 dog every 15 inhabitants) dog bites have become a major public health concern (1). In Switzerland the annual incidence of dog bites is 195/100'000 and 60 % of the victims are children. 5 % of all (adults and children) emergency hospitalizations are consecutive to a dog bite in Switzerland (2).

Aims: A general study evaluated the epidemiology of dog bites, the therapy, the follow up, the direct costs of treatment and the possibility of prevention.

This study analyses the **direct costs** caused by the treatment of children victims of dog bites in our institution.

Methods: The study was carried out over one year from September 2000 to August 2001. All consecutive patients aged from 0 to 16 years consulting for a dog bite in our emergency room were enrolled. Data were recorded about: the child, the dog, the event, the wound, the medical follow-up and direct costs caused by these events.

Results: 43 children, 24 boys and 19 girls (sex ration M/F 1.3) were recruited, average age was 6 years (range 12 months-17.7 years). There were two age peaks: 1-2 y.o. (34 %) and 5-6 y.o. (27 %). 53 % of the wounds were on the head and neck (9 periocular and 6 perioral), 21 % on the legs, 15 % on the arms (9 % on the hand) and 11 % on the trunk; 12 % children had multiple wounds. The wounds ranged from superficial bruises, punctiform, star-shaped or deep to large lacerations. 68 % of the children were treated as out-patients and the remaining (14 children) were hospitalized for 4 days on average. 2 secondary infections occurred, with favorable outcome after repeated surgical debriding and prolonged antibiotic therapy (10 days). No child required admission to the intensive care unit (ICU). 87 % of patients required out-patient follow-up; 42 % more than 3 times.

As a whole, the patients required 54 hospital days (an average of 1.3 days/range 2-10 days) with a billed cost of CHF 47'875.85 (hospital standard per-day set prices). The actual costs (not standard per-day set prices) were: for 54 days of hospitalization (CHF 1100.- /day): CHF 59'400.-, for the hospitalization tax (CHF 700.-/child): CHF 9800.-, and for the operation (set-price of CHF 3000.-/child): 30'000.-, the total actual cost was therefore CHF 99'200.- * (CHF 2'307.- /child), which is more than double the billed invoices. The total number of out-patient consultations were 97 (an average of 2.3/child, range 1-7), with a total cost of CHF 9'931.70 ** (CHF 242.25/child). The total average direct cost (admission* + outpatient visit(s)**) was CHF 109'131.70 (CHF 2'549.25/child).

Conclusion:

This study underlines that in-patient treatment is much cost effective than out-patient treatment. Even if the patient's lesions are different, we should think about the possibility of increasing out-patient treatment eventually with an i.v. antibiotics administration through a home nurse consulting system.

Furthermore this study shows that the costs consecutive to dog bites aren't negligible, especially knowing that the real costs (treatment-related and indirect) are much higher than the hospital-set prices, and should be an **additional argument** to enforce active prevention by authorities, dog's owners, parents and teachers.

(1) Medizinisch versorgte hundebeissverletzungen in der Schweiz Opfer – Hunde – Unfallsituationen, Inaugural-dissertation, Ursula Horisberger, Veterinär-medicinischen fakultät Universität Bern, 2002.

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The epidemiology of bite and scratch injuries by vertebrate animals in Switzerland

Hans C. Matter¹ & the Sentinella Arbeitsgemeinschaft²

¹Swiss Federal Office of Public Health, Division of Epidemiology and Infectious Diseases, Bern; ²Fakultäre Instanz für Allgemeinmedizin, University of Bern, Bern, Switzerland

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Abstract. Pet and wildlife populations are a potential source of various public health problems, and injuries and complications due to animal bites and scratches are the most obvious. As no population based data on the frequency of animal bites were available at a national level in Switzerland, a study was conducted by the Swiss Sentinel Surveillance Network. The objectives of this study were to estimate the incidence of medical consultations due to bite and scratch injuries in humans caused by vertebrate animals, to identify possible risk factors, and to assess bite management habits in primary health care. An annual bite and scratch incidence rate of 325 per 100,000 population was estimated. Consultations peaked during the summer months and geographical differences in the reported incidence were observed. Dogs accounted for more than 60% and cats for about 25% of all cases reported. Animal bites and scratches were frequent in persons under 20 years of age. In most ages, the incidence was higher among women than among men, but not in children under the age of ten years. The incidence of cat bites was especially high in adult women.

Bites to the head and neck were most frequent in infants and young children and accounted for approximately one third of the reported cases in this age group. Patients sought medical care principally for primary wound care (52.0%) and for vaccination advice (29.6%). Rabies postexposure prophylaxis was initiated in 1.1% of patients. Wound infection was reported in 10.9% of cases, with cat bites/scratches being more often infected than injuries due to dogs. Hospitalization was reported in 0.3% of patients. Data from the emergency department of two district hospitals showed that head and neck injuries were more frequent in out-patients and a higher proportion of persons presented with wound infections (14.1%). The hospitalization rate for emergency department visits was 4.7%. Animal bites and scratches are common events in Switzerland. They represent a public health issue of growing importance due to the steadily increasing pet population. A practice based sentinel surveillance system may be an appropriate tool to monitor national trends in animal bites and scratches.

Key words: Animal bite, Epidemiology, Rabies, Sentinel surveillance system, Switzerland

Abbreviations: ED = emergency department; PEP = postexposure prophylaxis; RIG = rabies immunoglobulin; SSSN = Swiss Sentinel Surveillance Network

Introduction

Despite its uncontested benefits, the relationship between the human, pet, and wildlife population is a potential source of public health concern. For pets, Baxter identified four principal categories of nuisance which include environmental pollution (noise, excreta), zoonoses, and injuries such as bites, road-traffic, and home accidents [1].

Bites and scratches are a source of significant morbidity because of scarring and wound infection caused by various organisms. Other important effects of ani-

mal bites should also be considered, such as pain, anxiety, disfigurement, as well as costs of medical care [2, 3]. Dogs are the primary animal species implicated in bite injuries. In the USA, an estimated 0.76 million and 3.73 million persons are medically and nonmedically treated for dog bites per year, respectively [4]. Weiss et al. reported a total of 334,000 dog bite-related emergency department visits with a 4% hospitalization rate [5]. Although dogs account for more than 90% of all animal bites, cats (5%), rodents (2-3%), and other domestic and wildlife species also contribute to the bite problem [6].

Traditionally, rabies has been the primary reason for investigating animal-bite cases. Between 1988 and 1995, the Swiss Federal Office of Public Health received 565 mandatory reports of persons who had received rabies postexposure prophylaxis (PEP) following an animal bite. Of these, 44.8% were recorded in 1988 and 1989. Between 1990 and 1995 the number of patients per annum was significantly lower and ranged from 35 in 1991 to 77 in 1994. However, these data suffer from important underreporting and represent only a very selective proportion of animal bite victims (Matter HC, Swiss Federal Office of Public Health, unpublished data). Other studies on animal bites in Switzerland have been limited to specific populations such as children or travelers [2, 7]. To the best of our knowledge, no population-based assessment of the frequency of animal bites has been carried out at a national level in Switzerland.

Therefore, we aimed to determine the incidence of medical consultations due to bite and scratch injuries in humans caused by vertebrate animals. This study should also provide information on possible risk factors of animal bites and assess bite management habits in primary health care. For this purpose, all patients presenting with bite or scratch injuries were reported through the Swiss Sentinel Surveillance Network (SSSN) in 1995. The SSSN is a nationwide practice-based reporting system for acute infections. To complete these data, all patients presenting with bite or scratch injuries at the accident and emergency department of two district hospitals were also reported during the same period.

Methods

SSSN

Since 1986 the SSSN has been successfully used for the monitoring of vaccine preventable diseases such as influenza, pertussis, and measles [8-10]. In 1995, 190 sentinel family practitioners - 128 general practitioners (67.4%), 44 physicians specialized in internal medicine (23.2%), and 18 pediatricians (9.5%) - reported consultations for bites and/or scratches by vertebrate animals. These physicians, whose participation is voluntary, constitute a non-random sample of all family practitioners in Switzerland. For sample selection, all practices in Switzerland have been stratified by geographic area, socio-demographic characteristics of the area, and the physicians' specialty (72 strata). For strata with few participating physicians, selected practices were invited to join the surveillance system. Thus, while steadily increasing the sample size, the representativeness of the system has been continuously enhanced [11]. The average participation time of physi-

cians in the 1995 sample was five years. Between 1991 and 1995 roughly one sixth of physicians left the system and were replaced by new participants every year. Based on the adjusted total number of consultations and home visits covered by state subsidized insurance companies, we estimate that the participating physicians covered approximately 3.1% of the total number of annual consultations in family practices in 1995.

Visits to accident and emergency department (ED)

All patients attending the out-patient accident and emergency department for bite/scratch injuries in 1995 were reported by two hospitals (Children's Hospital of Lucerne and the Cantonal Hospital of St-Gallen). These two hospitals covered less than 5% of all ambulatory consultations registered by the 'H+ Hospital Registry' in Switzerland in 1995 [12].

Case definition and questionnaire

Every consultation of a patient associated to the bite or scratch of a vertebrate animal had to be reported (e.g. for vaccination, primary wound care, complications, advice). Excluded were bites/scratches by non vertebrate animals as well as ~~accidents~~ injuries other than bites and scratches caused by vertebrate animals such as horse's kicks, animal associated road traffic and indoor accidents, unintentional injuries during the manipulation of dead animals etc. were also excluded.

For all patients fulfilling the inclusion criteria a specific questionnaire form was filled in by the practitioner. These forms were sent to the Swiss Federal Office of Public Health on a weekly basis and included information on gender and age of the patient as well as the anatomical site of bite, place of incident, species and origin of the animal, and treatment.

Age-specific incidence rates

Age- and gender-specific bite and scratch incidence rates (I_{ag}) were estimated from the SSSN reports using the following formula [10]:

$$I_{ag} = \sum (B_{ag} R_{ag} / K_{ag})$$

B: number of consultations for bite/scratches reported by the sentinel physicians;

K: total number of consultations for any reason reported by the sentinel physicians;

R: per annum population consultation rate (number of consultations for any reason/100,000 population). This was estimated by using the total number of consultations in family practices reported by subsidized insurance companies and the average population in Switzerland;

a: age group;

g: gender:

s: specialty of the reporting physician.

Results

med. tot = 190 ^{person}
_{not}
_{peel}

Animal bites reported in the SSSN

During 1995, 654 patients presenting with animal bites and scratches were reported by 128 general practitioners (511 cases), 44 physicians specialized in internal medicine (118), and 18 pediatricians (25) participating in the SSSN. At least one case was reported by 89.8%, 77.3%, and 66.7% of the physicians of the three classes. Bites and scratches by domestic cases accounted for 62.8% and 25.1% of all consultations, respectively. Other domestic animals accounted for 9.0% and zoo animals for 0.6% of patients. Only 2.4% of consultations were due to injuries caused by wild animals (rodents, terrestrial carnivores, ungulates, and non mammalian animals). Injuries inflicted by mammals accounted for 98.9% of consultations. The remaining cases included birds (4), snakes (2), and fish (1).

In 39.0% and 43.3% of cases, the patient and the biting animal either lived in the same household or the owner of the animal was known to the patient, respectively. After excluding bite incidences caused by wild animals, the owner of the animal was known to the patient in 83.9% of cases (82.2% for dogs and 84.8% for cats). For 9.6% of patients (16 years and older) the incidence was connected with professional activity. Farmers, postmen, policemen and veterinarians accounted for 50% of these patients.

Animal bites were generally more frequent in persons under 20 years of age (Table 1). Of the 654 cases reported, 287 (43.9%) were in men and 367 in women

Table 1. Incidence rates of bite and scratch injuries per 100,000 population

	Age group (years)				
	0-9	10-19	20-39	≥ 40	Total
All species					
Male	364.2	270.2	287.8	205.6	259.3
Female	257.9	443.8	333.4	367.4	353.1
Total	312.5	354.7	310.5	292.0	307.3
Dogs					
Male	260.4	208.4	205.1	149.0	187.9
Female	156.1	286.3	173.4	200.9	196.8
Total	209.6	246.3	189.3	176.7	192.5
Cats					
Male	55.2	33.5	59.7	30.3	43.2
Female	30.9	61.2	103.8	145.0	110.6
Total	43.3	47.0	81.6	91.6	77.7

(56.1%). Incidence rates of animal bites/scratches were higher in most ages for women, but not for children below ten years of age. The global sex-specific incidence rates of dog bites/scratches were almost the same for both sexes. However, female patients seen for cat bites were twice as frequent as male patients. The incidence of cat bites/scratches was especially high in adult women. The extrapolated total number of consultations in Switzerland for bites and scratches by vertebrate animals was approximately 9000 for men and 12,500 for women. This corresponds to a yearly incidence rate of 259 cases per 100,000 and 353 per 100,000, respectively.

A high number of bites/scratches was reported at the end of July and in August. In this period, three consecutive weeks with more than 0.10 reports per 100 consultations were observed. Less sustained peaks ($\leq 0.10/100$ consultations) occurred in February, May, and October. The lowest bite incidence was registered in December (0.034 per 100 consultations and week on average).

The highest yearly reporting frequency were observed in Schaffhausen (0.25 per 100 consultations), Solothurn (0.10 per 100 consultations), and Freiburg (0.10 per 100 consultations). Schaffhausen and Solothurn are situated in the northern and Freiburg in the western part of Switzerland. In nine cases, the bite/scratch took place abroad (six cases in Western European countries and one case in Egypt, Dominican Republic, and Thailand).

Patients presenting with bite injuries but no scratches and vice versa were observed in 71.1% and 17.3% of cases, respectively. In 11.2% of cases, both bites and scratches were present and in 0.5% of patients the nature of the injury was not specified. Perforation of the skin was reported in 89.0% of cases. Of bite/scratch injuries, 42.1% were on the hands, 23.8% on the legs, and 20.4% on the arms. Bites to arms and/or hands were more frequent in 20-year old and older persons (64.6%) than in children and young adults under 20 years of age (51.2%). Bites to the head and neck were most frequent in infants and young children and accounted for approximately one third of the reported cases in this age group (Table 2). Dog bites more commonly involved the lower extremities (35.4%) followed by hands (30.2%), arms (19.3%), face, head, neck (9.0%), and trunk (6.1%). However, 40.0% and 25.0% of dog bites involved the head and/or the neck in children under five and fifteen years of age, respectively. Cat bites frequently involved hands (58.0%) followed by arms (10.6%), lower extremities (9.7%), face, head, neck (5.7%), and trunk (1.1%). Bites to the head and/or neck were reported in 16.7% of children under five years of age and in 9.8% of children and young adults under fifteen years of age.

Sex

Period

Location

bite + scratch

location

type of injury + location

Table 2. Sites of bite and scratch injuries reported by the Swiss Sentinel Surveillance Network*

	Age group (years)									
	0-4		5-9		10-14		15-19		20 and more	
Head and neck	10	(31.3)	8	(15.7)	8	(16.3)	3	(8.6)	26	(5.1)
Arms	3	(9.4)	10	(19.6)	7	(14.3)	7	(20.0)	111	(21.8)
Hands	14	(43.8)	16	(31.4)	19	(38.8)	10	(28.6)	226	(44.3)
Torso	2	(6.3)	1	(2.0)	4	(8.2)	0	(0.0)	22	(4.3)
Legs and feet	3	(9.4)	16	(31.4)	11	(22.5)	15	(42.9)	125	(24.5)
Total	32	(100.0)	51	(100.0)	49	(100.0)	35	(100.0)	510	(100.0)

* One site was indicated in 602 cases, two sites in 33 cases and three sites in three cases. For 16 reports the site of the bite was missing. Percentages are given in parenthesis.

Patients sought medical care principally for primary wound care (52.0%) and for vaccination advice (29.6%). In 53.3% of cases, physicians indicated complications after bite/scratches as the patient's principal motivation for the visit. Ninety-one percent of patients went to the doctor within three days of the bite. The mean time elapsed since bite injury was significantly higher in cases where the exposure was outside of Switzerland (9.6 days) compared to patients where the exposure occurred in Switzerland (1.4 days) (Kruskal-Wallis; $p < 0.001$). For patients with injuries inflicted by dogs, cats, or other animals, debridement was reported in 13.7%, 15.3%, and 7.7% of cases, respectively. Suturing was performed in 9.7%, 3.7%, and 5.1% of cases in these three classes. The overall proportion of patients with debridement and/or suturing was 13.4% and 7.6%. Two patients (0.3%), one bitten by a dog and the other bitten by a cat, were hospitalized. Wound infection was reported in 10.9% of all patients and in 12.4% of patients with perforating bites/scratches. The overall proportion of cases receiving antibiotic treatment was 35.0% indicating that in probably about one fifth of cases antibiotics were given prophylactically. Cat bites/scratches were more often infected than injuries due to dogs (31.3% versus 6.0%). Patients presenting up to one day after the bite/scratch had infected wounds in 7.1% of cases. This proportion was 19.2% and 22.2% for patients presenting 'two to three' and 'more than three' days after the bite/scratch, respectively. Bacterial laboratory diagnosis was performed in five cases. *Pasteurella multocida* (cat), *Pseudomonas aeruginosa* (dog), *Peptostreptococcus sp.* (cat) were detected in three of these.

In 72 cases (11.4%) the physician indicated that the bite/scratch occurred in a rabies endemic area. Of these, 95.8% were in Switzerland, and 4.2% in other countries (missing: 21). In six cases, the animals were sent to the Swiss rabies laboratory for diagnosis. None of them was rabies positive. Rabies PEP was initiated

in six adults (29-55 years) and in one seven year old boy (1.1%). One patient had been bitten by a dog in the Dominican Republic. The remaining six cases concerned patients who had been bitten in Switzerland (three cats, two dogs, one rodent), five of these in areas in which rabies was considered endemic in 1995. Perforation of the skin was reported in all cases and laboratory rabies diagnosis was not available for any of them. In accordance with the recommendations on rabies PEP, rabies immunoglobulin (RIG) was given to four patients [13, 14], but not to two persons with documented preexposure prophylaxis. In contradiction to these recommendations, a 51-year old woman who had not previously been vaccinated received PEP without RIG after having been bitten in the leg by a cat. The origin of the animal was unknown.

Animal bites reported from EDs

Animal bites and scratches accounted for 0.36% of all consultations in the Children's Hospital in Lucerne. A total of 18 cases (seven boys and eleven girls between one and 15 years of age) were reported. Of these, 77.7% were bites and 22.2% scratches. The animal involved were dogs (16) and cats (2). In 22.2%, the patient and the biting animal lived in the same household. In 57.1% of the remaining cases, the owner of the animal was known to the patient.

Perforation of the skin was reported in 83.3% of cases. Bites to the head and neck were reported for half of the cases. This was significantly more than the proportion of head and neck injuries reported by the sentinel physicians for this age segment (Mantel-Haenszel Weighted Odds Ratio (age stratified): 6.71; 95% confidence limits: 1.31; 5.98). The ED was attended within the same day of the bite/scratch by 76.6% of patients and by 95.3% of patients within three days. PEP was initiated in one six year old boy bitten by a German shepherd of unknown origin. Infection of the bite/scratch wound was reported in one case (perfo-

rating dog bite) (6.7%). Antibiotics were given to 83.3% of patients.

Animal bites and scratches accounted for 0.29% of all consultations in the Cantonal Hospital of St-Gallen. Twenty men and 26 women who presented with bites (87.0%), scratches (8.7%), or both (4.4%) were reported. In 89.1% of cases, the bite was perforating. Bites and scratches by dogs (67.4%) and cats (26.1%) accounted for 93.5% of consultations. In the remaining three cases, one horse and two domestic rats were involved. Of patients presenting with dog-associated injuries, 48.4% were men. However, 75.0% of patients bitten/scratched by a cat were women. In 30.4% of cases the patient and the biting animal lived in the same household. In 62.5% of the remaining cases, the owner of the animal was known to the patient. In 73.9% of cases either the animal lived in the same household or the owner of the animal was known to the patient. In 10.0% of patients (16 years and older) the bite/scratch was connected to their professional activity.

The ED was attended within the same day of the bite/scratch by 73.9% of patients and by 95.7% of patients within three days. In one case, a dog was available for rabies diagnosis, however with a negative result. Infection of the bite/scratch wounds was reported in 17.4% of all cases and in 19.5% of patients with perforating bites/scratches. The proportion of infected injuries was higher for cat bites (41.7%) than for dog bites (9.7%). A total of 60.9% of patients received antibiotic treatment. In 45.7% of cases, debridement was reported. Three adult patients were hospitalized (crisypela (2), abscess (1)).

Discussion

Animal bite/scratch incidence

Statistics on animal bites tend to be incomplete as most bite injuries are minor and self-treated [15]. If data are available, they often relate to cases seen at hospital, thereby predominantly excluding the milder ones. In addition, mandatory notification systems which may include reports from hospitals, family practitioners, and other sources often suffer from substantial underreporting. On the basis of different surveillance systems, the estimated annual incidence of dog bites varied between 150 to 500 in the UK [16-19], and between 140 to 740 in the USA [3, 20-22].

In 1996, the pet population in Switzerland was approximately 440,000 dogs and 1,300,000 cats. This corresponds to a human-to-dog and human-to-cat ratio of 16:1 and 5.5, respectively (EFFEMS AG, LINK Institute, personal communication). However, morbidity

data for animal bites are almost inexistent. Therefore, we used a pre-existing practice based sentinel reporting system to estimate the incidence of medical consultations following animal bite and scratch injuries on a national level in Switzerland. For vertebrate animals the incidence was approximately 310/100,000 population and 190/100,000 and 80/100,000 for dogs and cats, respectively. Our study covered animal bite and scratch victims who received medical care by the family practitioner. We expected that the proportion of animal bites actually occurring within the population covered by a physician based reporting network would be substantially higher than for hospital attendance based systems. However, especially in the case of pets biting their owners the underreporting may still be important [23]. A survey conducted among pet owners and the general population in France indicated that bites were common events (3.4% of interviewees reported a dog or cat bite in their household within the 12 last months) and occurred more often in pet owners (8.6%) [24]. In 1984, a survey was carried out in 851 households with dogs in the canton of Bern (Matter HC, University of Bern, unpublished data). In these households, the yearly incidence of dog bites was 1098/100,000 population and the proportion of bites inflicted by dogs belonging to the household was 28.5%.

Another substantial proportion of bite/scratch victims may receive medical care but they are not seen by family physicians. These patients present themselves to the hospitals' accident and emergency department. From the reports of two hospitals included in our study we assumed that on average, 0.33% of outpatients seen in hospitals present with animal bites/scratches (0.36% for the Children's Hospital in Lucerne and 0.29% for the Cantonal Hospital in St-Gallen). On the basis of the total number of ambulatory consultations in Switzerland for 1995 [12] we estimated that approximately 1500 bite/scratch patients received medical care at hospitals in Switzerland. By adding the estimated incidence of cases reported by the SSSN, the total number of patients receiving medical care after being bitten or scratched by a vertebrate animal was estimated at 23,000 in 1995. This corresponds to a incidence rate of 325/100,000 population per year. The actual incidence may be slightly lower, because patients may attend the ED and their family physician for the same bite/scratch incidence.

Risk factors

The occurrence of bite and scratch injuries is not homogeneous over the year and different animal species are involved. Bites usually take place during the summer months and the majority of cases is caused by

dogs and cats. Persons below 20 years of age are at higher risk of being bitten/scratched than older people and in most cases the owner of the animal is known to the victim. Retrospective surveys have shown that more than 20% of children have ever received an animal bite [25]. The observation of an overall female predominance in both the emergency room visits and the sentinel system is in discordance with results from other countries where a pronounced male predominance was described [22, 23, 26-29]. However, we observed a higher incidence rate in male children below ten years of age. Other studies have shown a weaker predominance of male patients in young children [26]. In some studies women were reported to be more frequently bitten by cats than were men [30-32]. In our study the sentinel and hospital sample showed a significantly higher proportion of female patients with cat-associated bite/scratch injuries.

Complications

Most bite injuries are minor. However, reviewing injuries resulting from animal bites, Weber and Hansen found that at least 10% require suturing, and 1% to 5% require hospitalization. Although rare, even death may occur [33, 34]. Of 232 children attending the ED of the children's hospital in Zurich (Switzerland), 5.2% were hospitalized [2]. In our pooled sample, this proportion was 4.7%. We estimated a very approximate incidence of 1.0 hospitalization following animal bite/scratch injuries per 100,000 population for the whole country.

Bite and scratch injuries can become infected as a high number of bacterial diseases can be transmitted by animal bites [35]. The infection rate from penetrating dog bites has generally been reported to be in the range of 5% to 15% [25]. In a study in France, bacterial contamination was found in 56.4% of patients presenting with dog bite wounds [36]. However, it should be kept in mind, that infection rates tend to be overestimated. Frequently, it is only after the development of complications that patients present. This fact causes a bias in retrospective studies to elevate the rate of infection [37]. In our sample, no systematic laboratory examination was performed. The proportion of clinically diagnosed infections in the sentinel sample was 5.2% for dogs and nearly 30% for cats. Slightly higher proportions were observed in the hospital sample. Cat bites actually have a higher probability to become infected and infection rates up to 80% have been reported [38].

Bite/scratch management

Standard recommendations for the medical and surgical management of animal bites include tetanus immunization, cleansing by copious irrigation, cautious debridement, elevation, immobilization, antibiotics if indicated, and in some cases suturing [14, 25, 30, 39, 40]. For any bite/scratch by a mammal, the risk of a rabies exposure has to be carefully assessed by the physician [40]. Since 1977, Switzerland experienced no human rabies case. However, as long as terrestrial wildlife rabies has not been eliminated in Switzerland, the risk of transmission of this fatal disease to humans by animal bites is real. In our study, a high frequency of cases was observed in northern Switzerland. In this part of the country, fox rabies was still endemic in 1995. The presence of rabies and enhanced public awareness may have led to the increased number of bites reported at least in some of these cantons. Special concern should also be given to patients presenting with injuries from animal bites/scratches which occurred in dog rabies endemic countries. Of 58 human rabies cases between 1977 and 1992 in Europe which were reported to the WHO Collaborating Center of Tübingen (D), imported cases accounted for one third. Rabies incubating animals imported from endemic countries are another potential source of infection. TTT
3. 4. 5.
RAGE
1/3 extra EU

Animal bites are common in Switzerland and a practice based sentinel system may be an appropriate tool for monitoring. With pet populations increasing, animal bites and scratches represent a public health issue of growing importance. However, animal bites may be prevented in many cases [26, 31]. People and especially children should be taught to refrain from behaviors likely to provoke bites and to follow recommendations for the prevention of canine aggression [34, 41, 42]. Travelers to dog rabies endemic areas should be aware of the increased risk especially in case of dog and cat bites and in rabies endemic areas any contact with potentially rabies transmitting animals should be avoided.

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Address for correspondence: Hans C. Matter, PhD, Swiss Federal Office of Public Health, 3003 Bern, Switzerland
Phone: +41 31 323 87 56; Fax: +41 31 323 87 95
E-mail: hans.matter@bag.admin.ch

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Morsures de chiens chez l'enfant

B. Chevallier^{1, 2}, M. Sznadje²¹CIRPAE (Centre d'information et de rencontre pour la prévention des accidents de l'enfant), 26, boulevard Haussmann, 75009 Paris ;²Urgences pédiatriques et département de biostatistiques et d'informatique médicale, hôpital Ambroise-Paré, 92100 Boulogne-Billancourt, France

En France, deux familles sur trois possèdent un animal de compagnie, soit près de 35 millions d'animaux et, parmi ceux-ci, on compte près de dix millions de chiens. Les avantages pour l'enfant de la présence d'un animal à la maison sont nombreux sur le plan psychologique, affectif, éducatif et même parfois thérapeutique. Les morsures de chien sont la conséquence d'interactions comportementales entre l'enfant et le chien : elles constituent un type particulier d'accident domestique dont la relative fréquence et la possible gravité nécessitent qu'on en connaisse mieux les circonstances pour en développer la prévention.

ÉPIDÉMIOLOGIE

Les patients

Incidence

L'incidence des morsures de chien chez l'enfant en France peut être appréciée à la lumière de plusieurs sources (enquête Inserm 1982 dans les Yvelines, enquête européenne EHLASS 1996) [1]. On estime l'incidence annuelle des enfants mordus par un chien et requérant des soins médicaux à 30-50 pour 100 000 enfants âgés de 0 à 15 ans. Elle s'élève à 8,6 % si l'on considère l'ensemble des morsures, y compris les morsures bénignes. Certaines publications américaines font état d'un pourcentage d'enfants mordus au moins une fois dans leur vie compris entre 25 et 40 % [2]. Dans les statistiques hospitalières, les morsures de chien représentent 0,5 à 1 % des consultations et 5 % des plaies dans les services d'urgences chirurgicales.

Âge et sexe

Plus de 50 % de l'ensemble des morsures de chiens dans la population générale s'observent entre 0 et

18 ans [2], mais il existe deux pics de fréquence (entre 1 et 4 ans, et entre 10 et 13 ans) et une prédominance masculine (56-65 %), en particulier entre 1 et 4 ans.

L'accident et ses conséquences

Lieu

Les morsures se voient toute l'année mais avec un pic de fréquence net de juin à septembre. Il s'agit presque toujours d'un accident domestique, à l'intérieur de la maison (15 à 20 %) ou dans les dépendances immédiates (35 à 40 %), généralement le domicile familial ou celui d'amis [1-3]. Les autres lieux (parcs, squares, rue) représentent 15 à 20 % de l'ensemble des morsures. L'enfant était seul dans la pièce ou le jardin avec le chien dans 20 à 25 % des cas et, dans plus de 50 % des cas, l'accident est survenu en l'absence de surveillance adulte [2, 4].

Circonstances

Quatre causes d'agression de l'enfant par le chien sont rapportées [5].

Aggression par peur

L'accident se produit lorsqu'un enfant veut, en jouant avec le chien, le manipuler, lui tirer le poil, etc., et que, pour une raison ou une autre, l'animal ne peut s'échapper et prendre la fuite ou lorsque le chien en laisse est approché par un enfant voulant l'étreindre ou l'embrasser. D'autres situations sont rapportées : enfant allongé dans la couche du chien ou voulant lui retirer l'écuille $\rightarrow$ *scabie*

Aggression par mise en cause de la hiérarchie familiale

Lorsque la place hiérarchique dans la famille est ressentie comme remise en cause par le chien, une

- Chiens errants
- animal de compagnie

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réaction d'agressivité peut se mettre en place. Il s'agit le plus souvent d'un chien mal socialisé, servant de substitut d'enfant dans une famille et qui sent que sa place est modifiée par l'arrivée d'un enfant. L'intrusion de l'enfant dans l'espace vital du chien (appropriation de la couche, de la nourriture) peut également induire des réactions de défense de l'animal.

Agression due à une maladie

L'animal est agacé par des sensations douloureuses ou de gêne durable qui sont restées méconnues : otite chronique, dermatose, maladie ostéoarticulaire négligée. La morsure est habituellement précédée d'une longue phase de comportements agressifs.

Comportement pathologique

Ce type d'agressivité est rare en France et plutôt le fait de chiens errants qui deviennent de véritables prédateurs comme dans certaines régions des États-Unis, ou de chiens atteints d'affection neurologique : encéphalite, tumeur cérébrale ou vasculaire.

Siège des lésions

Le siège lésionnel varie en fonction de l'âge de la victime. Chez l'enfant jeune, le visage est le plus souvent touché (70 à 85 %) : lèvres, joue, nez, paupières, front, puis la nuque, le cou et le membre supérieur [1-3]. Chez l'enfant plus grand, les localisations sont plus variées, incluant le membre inférieur (mollets), le membre supérieur (main, base du pouce) et enfin le visage. Les doubles localisations ne sont pas rares, correspondant soit à deux attaques, soit plus souvent à l'impact des canines opposées au cours d'une même morsure.

Gravité lésionnelle

Si la majorité des morsures de chien sont bénignes, certaines sont très graves, en particulier du fait de séquelles esthétiques au visage. Les plaies simples linéaires ou à bords anfractueux sont les plus fréquentes. Une perte de substance est possible (avulsion cutanée ou musculaire). La morsure est généralement superficielle, mais peut être profonde, pénétrante ou transfixiante (joue), s'il s'agit de gros animaux, et des décollements sous-cutanés peuvent être masqués en l'absence d'examen soigneux. Sur 100 morsures requérant des soins médicaux, 5 à 10 % nécessitent une hospitalisation dans le but

d'une exploration sous anesthésie [1, 2]. Les statistiques des causes médicales de décès publiées par l'Inserm font état de zéro à deux décès par an en France depuis 1985 (10 à 15 décès annuels aux États-Unis). Le nombre de séquelles (fonctionnelles ou esthétiques) est estimé entre 1 et 3 % de l'ensemble des morsures [3, 4].

Le chien : taille, âge, lien avec l'enfant

Les enquêtes montrent une prédominance de gros chiens et surtout de bergers allemands (40 à 50 %) loin devant les autres races : terrier, cocker, caniche, husky, labrador. Cette accusation d'agressivité particulière du berger allemand doit être tempérée par deux considérations : les bâtards sont souvent inclus à tort dans cette catégorie et les morsures de gros chiens donnent lieu à davantage de consultations, du fait même de lésions plus sévères en rapport avec leur taille et la force de leurs mâchoires. La part des chiens réputés « féroces », doberman, rottweiler, pitt-bull terrier, ne représente qu'une minorité de l'ensemble des morsures (moins de 2 %), même si les lésions sont souvent plus spectaculaires. Les chiens agresseurs sont le plus souvent jeunes et de sexe mâle [4].

Le chien mordeur est celui des parents (15 %), de la famille proche (20 %) ou des voisins (40 %). La responsabilité éventuelle d'un chien errant ou d'un chien dont les propriétaires sont inconnus de l'enfant ou de la famille est rarement en cause. Cependant, dans près d'un cas sur deux, l'enfant ne connaissait pas l'animal avant l'accident, ce qui explique ainsi sa difficulté pour appréhender les réactions de l'animal [4].

CONDUITE À TENIR DEVANT UNE MORSURE DE CHIEN

La prise en charge des patients est souvent tardive : 30 % des enfants sont amenés en consultation au-delà de la 24^e heure. Le pronostic est étroitement lié au délai de prise en charge.

Anamnèse

La collecte d'informations précises est essentielle et comporte des questions sur les cir-

Risque infectieux ?
- delors de prise au crabe > 6h

constances de l'accident et les antécédents de l'enfant.

L'animal : s'agit-il d'une espèce sauvage, domestique ? Le propriétaire est-il connu ? Le propriétaire contacté pourra alors donner des informations concernant son animal : a-t-il déjà été agressif ? Son comportement était-il normal dans les jours précédents ? Ses vaccinations sont-elles en règle ?

Le lieu : l'accident est-il survenu dans une région à risque rabique connu ?

L'enfant lui-même : est-il immunocompétent ?

Quel est son statut vaccinal ?

La morsure : à quelle heure s'est produite la morsure ? Quel traitement initial a été réalisé ?

Rassurer, et soulager la douleur

Souvent encore sous l'effet du choc, l'enfant est inquiet et doit être rassuré. Des antalgiques doivent être facilement prescrits.

Place de l'antibiothérapie

La salive animale et en particulier celle du chien est le siège d'une flore microbienne polymorphe comprenant des germes pyogènes (staphylocoques, streptocoques) et des anaérobies ; 30 à 60 % des chiens sont porteurs asymptomatiques de différentes souches de *Pasteurella* [6]. La fréquence des infections après une morsure de chien est généralement estimée entre 5 et 15 %. Plus de 50 % des plaies par morsures animales vues aux urgences hospitalières sont contaminées (présence de germes à l'examen direct ou en cultures). Une méta-analyse de Cummings [7] portant sur huit études trouve une fréquence d'infection (germes plus manifestation clinique) après morsure de chien de 3,2 à 45,8 %.

Certains caractères de la plaie sont corrélés avec un risque accru d'infection : plaie inflammatoire, profonde, douloureuse ; présence d'un décollement sous-cutané ou d'une perte de substance. Ainsi lorsque la plaie est inflammatoire, le pourcentage de prélèvements positifs atteint 25 %, avec une prédominance de pasteurelles. Les plaies de la main s'infectent plus fréquemment. Un délai de plus de six heures entre l'heure de la morsure et les premiers soins locaux, reflet du temps de présence de la salive animale sur la plaie, est associé à un plus grand risque infectieux. Les germes en cause peuvent être multiples [6, 7]. Dans 60 à 75 % des cas, la contamination est plurimicrobienne. Les pasteurelles (*Pasteurella canis* et *multocida*) sont les plus fréquentes (40 à 50 %), puis les streptocoques (*Streptococcus mitis*, *mutans*, *pyogenes* ; 35 à 45 %), les staphylocoques (*Staphylococcus aureus*, *epidermidis*, *warneri* ; 30 à 40 %). Des germes anaérobies (*Fusobacterium*, *Bacteroides*, *Porphyromonas*, *Prevotella*, *Propionibacterium*) sont trouvés dans 20 à 30 % des cas, et le plus souvent associés aux germes aérobies.

La place de l'antibiothérapie pour prévenir les infections secondaires aux morsures de chien fait l'objet de nombreuses études aux conclusions souvent contradictoires. Certains auteurs préconisent l'antibiothérapie systématique, d'autres la réservent aux mor-

L'examen clinique

Il précise le siège de la plaie et ses relations avec les axes vasculonerveux, les tendons et les articulations, son aspect net ou contus, l'existence possible de décollements sous-cutanés, et estime sa profondeur. Les plaies tendineuses ne sont pas rares et peuvent être difficiles à déceler lors du premier examen clinique.

L'examen recherche des signes de gravité en fonction de leur retentissement esthétique (localisation au visage ou avulsion), fonctionnel (atteinte nerveuse, du globe oculaire, plaie ou contusion vasculonerveuse, attrition musculaire) ou infectieux (peau contuse, ecchymotique, décollements), d'effraction articulaire ou de la gaine des tendons fléchisseurs.

Crallenet

Mesures urgentes

Désinfection

Faite le plus rapidement possible, elle fait appel à un ammonium quaternaire ou à une solution iodée ou de chlorhexidine, après rinçage à grande eau de la plaie. Ce rinçage raccourcit le temps de présence des gouttelettes de salive infectées de l'animal dans la plaie et diminue le risque infectieux.

TR

sures présentant un risque infectieux particulier, les facteurs de risque retenus étant soit liés à la localisation (visage, mains) ou à l'aspect de la plaie (inflammatoire d'emblée, sale, profonde, peau contuse ou perte de substance). Une réduction significative (44 %) de l'incidence des complications infectieuses par l'antibiothérapie prophylactique est démontrée par la méta-analyse de Cummings [7], à la condition qu'elle soit débutée dans les heures qui suivent la morsure. Plusieurs familles d'antibiotiques remplissant les critères d'efficacité requis (diffusion tissulaire, spectre couvrant pasteurelles et pyogènes, prise orale) peuvent être utilisées : cyclines, amoxicilline-acide clavulanique, quinolones. Le schéma thérapeutique pour l'association amoxicilline-acide clavulanique est de 50 mg/kg pendant sept à dix jours. Les cyclines sont utilisées chez le grand enfant et l'adolescent.

Si l'antibiothérapie systématique à visée prophylactique en première intention est controversée, sa place n'est pas discutée lorsque des signes inflammatoires locaux ou locorégionaux apparaissent. Un œdème précoce et douloureux autour de la plaie, avec lymphangite et adénopathies, évoque une infection à pasteurelles, alors que des signes plus tardifs (au-delà de la 48^e heure) sont le plus souvent associés à des germes pyogènes.

Suture ou pas suture

La suture de la plaie reste sujet à controverse. Il semble raisonnable de la proscrire quand la morsure est ancienne (après 48 heures) et surinfectée (la suture peut être envisagée à trois jours si la plaie est propre). En revanche, quand la morsure est vue très précocement et n'est apparemment pas souillée, il est possible de la suturer mais sans rapprocher de façon trop étroite les berges de la plaie, ou simplement de la panser à plat avec des pansements gras et des antiseptiques. L'utilisation de stéristrip peut alors être intéressante.

En revanche, une suture précoce est souhaitable dans les morsures du visage pour limiter les séquelles esthétiques [8]. Elle sera précédée d'un parage chirurgical.

L'exploration chirurgicale s'impose devant toute morsure profonde d'autant qu'elle se situe en regard d'un tendon ou d'un axe vasculonerveux.

Prévention antirabique

Elle est légale et doit être systématique. Elle consiste à s'enquérir de l'animal mordeur. Après une morsure, trois cas de figures peuvent se présenter (encadré) dont dépend la conduite à tenir.

PRÉVENTION DE LA RAGE CONDUITE À TENIR DANS LE CAS D'UN ANIMAL MORDEUR*

Dans le cas d'un animal domestique il convient d'abord de s'informer de l'identité du propriétaire de l'animal et de son domicile.

Le propriétaire est identifié

• Le chien est correctement vacciné. L'idéal est de pouvoir joindre au dossier la photocopie du certificat de vaccination de l'animal mordeur. On n'entreprend pas de vaccination du sujet mordu.

• Le chien n'est pas vacciné ou son statut vaccinal n'est pas connu. Une mise sous surveillance vétérinaire est exigée pendant la durée réglementaire de 15 jours (décret du 13 septembre 1976) et trois certificats vétérinaires doivent être produits à j1, j7 et j14. Il y a trois cas de figure :

– l'animal est vivant et sain lors du premier examen : le traitement vaccinal n'est pas entrepris. Si au terme de la surveillance la rage ne s'est pas déclarée, sa morsure n'était pas infectante. Dans le cas contraire, une vaccination est entreprise dans un centre antirabique, seul habilité à conduire ce traitement vaccinal (deux injections à j0, une à j7, une à j21) ;

– l'animal est vivant mais suspect au premier examen : le traitement vaccinal est entrepris ; il sera interrompu si l'animal se révèle sain ;

– l'animal est mort spontanément ou abattu après la morsure : la tête de l'animal doit être rapidement adressée à l'Institut Pasteur où sont effectués trois types de recherches (histofluorescence, recherche de particules virales en immunofluorescence, inoculation de broyats du cerveau suspect). On commence le traitement vaccinal en attendant les résultats des examens.

L'animal n'est pas retrouvé ou son cadavre est détruit

Traitement vaccinal complet.

*Institut Pasteur, Centre national de référence pour la rage, document mars 1995.

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morsures (de chien) / prévention

Summary – Dog bites in children.

B. Chevallier, M. Sznadger

Among children's domestic accidents, dog bites are of major concern. Most dog bites result in low severity injuries but some lead to definite esthetic or functional sequelae and require emergency treatment for wound repair and possibly hospitalization in a trauma center. Recommendations for medical and surgical management are presented. Prevention is important: children must be educated early on dog reactions even from the family dog; young children must never be left alone with a dog. © 1999 Éditions scientifiques et médicales Elsevier SAS

dog / bites / child / preventive medicine

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Analysis of Dog Bites in Children Who Are Younger Than 17 Years
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ARTICLE

Analysis of Dog Bites in Children Who Are Younger Than 17 Years

Johannes Schalamon, MD, Herwig Ainoedhofer, Georg Singer, MD, Thomas Petnehazy, MD, Johannes Mayr, MD, PhD, Katalin Kiss, MD, Michael E. Höllwarth, MD, PhD

Department of Pediatric Surgery, Medical University of Graz, Graz, Austria

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ABSTRACT

OBJECTIVES. This study focuses on the pattern of incidence, mechanisms, and circumstances of accident and injury in a series of pediatric patients who sustained dog bites.

METHODS. In our retrospective survey, the medical charts of all children who were younger than 17 years and sought medical attention after a dog bite between 1994 and 2003 were reviewed. To obtain the total number of each dog breed in the administrative district, we analyzed 5873 files from the community dog registers. For establishment of a risk index, the representation of a dog breed among the total canine population was divided by the frequency of dog bites from this breed.

RESULTS. A total of 341 children (mean age: 5.9 years) were identified. The annual incidence of dog bites was 0.5 per 1000 children between 0 and 16 years of age. Incidence was highest in 1-year-old patients and decreased with increasing age. The relative risk for a dog attack by a German shepherd or a Doberman was ~5 times higher than that of a Labrador/retriever or cross-breed. The vast majority (82%) of the dogs were familiar to the children. Most (322; 94%) of the children had injuries to 1 body region; in the remaining 19 (6%) children, up to 3 body regions were injured. Of 357 injuries, the face, head, and neck region was the leading site affected (50%). Inpatient treatment was required in 93 (27%) patients.

CONCLUSIONS. Dog bites in children are frequent and influenced by the breed-related behavior of dogs, dog owners, children, and parents. Therefore, prevention strategies should focus on public education and training of dogs and their owners. Children who are younger than 10 years represent the high-risk group for dog attacks.

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Key Words

child safety, dog bites, epidemiology, prevention

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Address correspondence to Johannes Schalamon, MD, Department of Pediatric Surgery, Medical University of Graz, Auenbruggerplatz 34, 8036 Graz, Austria. E-mail: johannes.schalamon@meduni-graz.at
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IN MANY FAMILIES, dogs play an important role as guards, companions, and friends. Unfortunately, this partnership is not without problems. In recent years, it has become more and more apparent that dog bites are a serious and often underestimated public health problem.¹ In the United States, an overall incidence of 1.3:1000 for dog bites that require medical treatment is reported.² In particular, children tend to underestimate the danger arising from dogs because they are more careless and inexperienced than adults in their interaction with dogs. This is confirmed by studies showing that children are more likely than adults to sustain canine bite wounds, with the highest incidence being among 5- to 9-year-old boys (6:1000 people).³ The likelihood of a child's sustaining a dog bite in their lifetime is ~50%.³ The aesthetic and psychosociological consequences of trauma caused by a dog bite reportedly burden the quality of life of the affected child and his or her family.⁴ Hence, pediatric dog bites represent a serious medical and public health issue. For developing proper prevention strategies, it is important to understand the circumstances and characteristics of dog bites. The major objectives of this study were to analyze the incidence, the mechanisms of accident, and the injury pattern as well as the required surgical treatment in a series of pediatric patients who sustained dog bites. Therefore, we evaluated retrospectively the charts of 341 children who sought medical assistance in our department as a result of dog-bite-related injuries.

METHODS

The Department of Pediatric Surgery at the Medical University of Graz is a level 1 trauma center that treats ~11 000 children annually. The census population aged 0 to 16 years in the respective catchment area is 62 457. Our retrospective survey included all children who were younger than 17 years and sought medical attention after a dog bite between 1994 and 2003. Patients' charts were analyzed for personal data, type of injury, and clinical course. The standard medical treatment of dog bites at our department consists of meticulous wound cleaning and closure of gaping wounds. Surgical closure was indicated when a firm wound closure without a suture was not possible. In the case of deep lacerations, wound drainage and/or systemic antibiotic treatment with either amoxicillin/clavulanate or cefuroxime/metronidazole was performed. Children with facial wounds or deep lacerations that required surgical closure under general anesthesia were admitted to the ward. A veterinarian's certificate was requested from the identified dog owners to exclude rabies. When the certificate could not be obtained within 24 hours after the dog bite, the child was assigned to rabies vaccination.

All children and/or their parents were interviewed and completed a questionnaire that contained the following items: dog ownership, the circumstances of the

accident, and long-term consequences for patients or dogs. The dog breed was taken from the veterinarian report.

To gain information about the local distribution of dog breeds, we analyzed 5873 files from the community dog registers (Fig 1) and added the information to a Microsoft Excel database that contained the data of the attacking dogs. For analysis, the 18 most popular breeds, accounting for 90% of all dogs, were considered, thereby excluding 31 breed populations with <64 dogs each. For calculation of the risk index, the representation of a dog breed among the total dog population was divided by the representation of this breed among all registered dog bites.

All children were followed up until wound healing and revisited 3 to 4 weeks after wound healing to document short-term results. Late follow-up was performed in 317 (93%) of the 341 children 2 to 11 years (mean: 7.2 years) after the dog attack. Seventeen of the remaining 24 children were contacted by telephone but declined to participate because of complete healing; 7 children could not be located.

Statistics

The χ^2 test was used to determine the statistical significance between groups. All computations were performed using the statistical software package SPSS 11.0.1 for Windows (SPSS, Inc, Chicago, IL). $P < .05$ was considered significant.

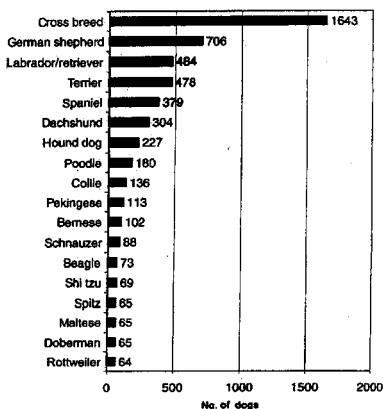
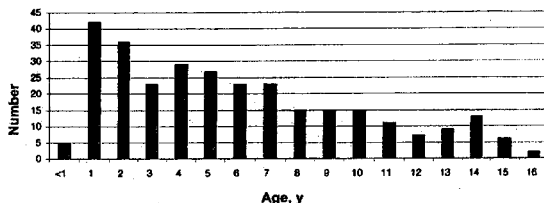


FIGURE 1
Local dog breed distribution as collected from the local community dog register. A total of 5873 files were analyzed, and 31 breeds with <64 dogs each were excluded.

FIGURE 2
Distribution of child age in 341 pediatric cases of dog bites.



RESULTS

In this study, 341 children (174 boys, 167 girls) who were aged between 8 days and 16 years (mean age: 5.9 years) were included. In the respective catchment area, dog bites accounted for 0.31% of all trauma-related hospital visits. The annual incidence of dog bites was 0.5 per 1000 children between 0 and 16 years of age. The highest incidence was found in 1-year-old children, with the incidence decreasing thereafter with age (Fig 2). A total of 73% of all affected children were younger than 10 years. A seasonal fluctuation was detected: a majority of the children were injured in the summer months, and peak incidence occurred during August. There was an almost equal distribution of dog attacks between the days of the week.

The vast majority (73%) of the dogs were familiar to the children, whereas in only 15% of the cases, the dog owner was considered as unfamiliar. A total of 12% of the affected patients could not specify the dog ownership (Table 1). In 75% of all known circumstances that led to the injury, the child interfered with the dog (Table 2).

A majority ($n = 322$; 94%) of the children had injuries to just 1 body region; in the remaining 19 (6%) children, up to 3 body regions were injured. Of 357 injuries, the face, head, and neck region was the leading body part affected (50%), followed by upper (28%) and lower extremities (18%). Injuries to the trunk/chest were less common (4%). A total of 290 (85%) children sustained deep wounds; 51 (15%) children presented with superficial scratches and minor lacerations. Children with injuries to the head and neck were significantly younger compared with the total study population (mean age: 4.1 year; $P < .01$).

TABLE 1
Distribution of Dog Owners in a Series of 341 Children Who Sustained a Dog Bite

Owner	% (n)
Household member	24 (83)
Friend	20 (68)
Stranger	15 (51)
Neighbor	15 (50)
Relatives	14 (49)
Unknown	12 (40)

According to the local veterinary guidelines, 198 (58%) of the biting dogs were classified as large (>44 cm of acromial height), 94 (28%) dogs were small; and the size of 49 (14%) dogs was unknown. In 305 (89%) of 341 dog attacks, the exact breed of the dog could be determined. The breed-related proportion of dog attacks is shown in Table 3. Bites from German shepherds and Dobermans accounted for 37% of all dog bites despite that these breeds account for only for 13.1% of the dog population. The relative risk for a dog attack by a German shepherd or a Doberman was >5 times higher than that associated with a Labrador/retriever or cross-breeds. Children who were younger than 5 years sustained significantly more attacks by small dogs compared with older children ($P = .04$).

Treatment

A total of 337 (99%) children presented within the first 24 hours after the dog bite. The remaining 4 children sought medical advice 24 to 72 hours after the attack with signs of wound infection subsequent to initial treatment at home. A total of 219 children visited the emergency department directly from the scene of the accident; 118 children were referred from general practitioners. In the emergency department, all children were examined by pediatric surgeons.

Inpatient treatment was required for 93 (27%) patients. The mean hospital stay of these children was 4.9 days (range: 1–13 days). Surgical procedures for wound adaptation were performed in 89 (26%) of 341 children, with 32 patients requiring wound drainage. The majority ($n = 77$, 87%) of these 89 children required general anesthesia for wound repair. Twenty-two children with soft tissue injuries of the extremities and 2 additional children with finger fractures had splint or cast immobilization. For 6 children, an ophthalmologist was consulted as a result of eye injuries.

Complications

Complications occurred in 40 (12%) children. Thirty-four (10%) children had wound infections, 27 of whom received primary antibiotic treatment. Delayed wound healing without clear signs of infection was recorded in

TABLE 2 External Circumstances of Dog Bites

Circumstance	%
Playing with/near dog	28
Passing the dog (walking)	14
Cuddling the dog	10
Feeding the dog	8
Passing the dog (cycling)	4
Disturbance of dog while eating	4
Surprising the dog	2
Pulling the dog's tail	2
Interfering during dog fight	2
Unknown	26

TABLE 3 Incidence of Dog Attacks According to Breed in a Total Study Population of 341 Children Aged 0 to 16 Years

Dog Breed	Dog Bites	Dog Bites, %	Dog Population, %	Risk Index
German shepherd	105	34	12	2.83
Doberman	8	3	1.1	2.71
Spitz	5	2	1.1	1.81
Pekingese	10	3	1.9	1.56
Dachshund	22	7	5.2	1.35
Schnauzer	5	2	1.5	1.33
Collie	10	3	2.3	1.30
Hound dog	15	5	3.9	1.29
Poodle	10	3	3.1	0.98
Rottweiler	3	1	1.1	0.92
Beagle	3	1	1.2	0.80
Terrier	15	5	8.1	0.61
Bernese dog	3	1	1.7	0.58
Labrador/retriever	11	4	8.2	0.49
Cross-breed	39	13	28	0.46
Spaniel	5	2	6.5	0.31
Shi Tzu	1	0.3	1.2	0.26
Maltese	0	0.0	1.1	0.00

The data about the distribution of the dog population was collected from the local community dog register. The risk index was calculated by dividing the representation of a dog breed among the total dog population by the representation of this breed among all evaluated dog bites.

5 (1%) children with major primary soft tissue lacerations. Two of these 5 children sustained hypertrophic scars. In 1 additional child with a finger fracture, a rereduction was required as a result of a secondary fracture displacement.

Late Problems

Five children complained of nightmares after the dog attack; fear of dogs remained with another 34 children. The 2 children with hypertrophic scars were underwent surgery for scar revision. Two dogs were euthanized as a consequence of repeated aggressive behavior.

DISCUSSION

The present report covers dog bites over a 10-year period. Taking into consideration that <50% of all dog bites are reported to doctors or police,⁴ it can be estimated that there is an annual incidence of 1:1000 children who sustain dog bites. Despite significant morbidity

related to dog bites, only a small number of fatal dog attacks on children have been reported previously. For example, Reuhl et al¹ described 20 fatal dog attacks in a 10-year period in Germany, Switzerland, and Austria, with half of the victims being children who were younger than 8 years (median: 2 years, 7 months). Death was caused either by multiple trauma or by injuries to the head and neck. In agreement with previous publications,⁶⁻⁸ our data showed that the most common area targeted by dogs was above the shoulders, reflecting the closer proximity of the child's head to the attacking dog. Fortunately, none of the children included in this report died, although the face, head, and neck region was primarily affected and 6% of our patients sustained multiple injuries.

Injuries to the face, head, and neck area occur more frequently in younger children. Scarring is a common consequence related to dog bites, and the resulting emotional distress should not be underestimated, particularly for face wounds. As Schmitt⁹ stated, "A child attacked by a dog and bitten above the shoulders is equivalent to an unarmed adult sustaining a bear bite. The human emotional coping is overwhelmed." Eleven percent ($n = 39$) of the children in our series reported prolonged emotional distress, including nightmares and subsequent augmented fear of dogs. The number of unreported cases of emotional distress likely is much higher than reported. Therefore, treatment strategies should include early psychological support considering the different trauma processing and coping strategies in children and their families. More assistance that focuses on these subjects will be required in the future.

We propose that the individual behavior of the attacking dog or the dog breed may be directly related to the severity of injuries. Voelcke¹⁰ stated that certain breeds are more aggressive than others. In addition, Gershman et al¹⁶ found male and unneutered dogs more likely to be aggressive compared with female and neutered dogs. In several countries, certain dog breeds are considered "fighting dogs" and are subject to legal regulations. In Germany, these breeds include mastiff, bull mastiff, bulldog, bullterrier, pit-bull, Tosa-Inu, and others. Media reports that have focused on aggressive behavior of fighting dogs and special training for dogs to make them more violent have led to an increased public awareness. This may explain why we did not identify any of these fighting dog breeds to be likely to attack more frequently than average. On the basis of the dog population in our catchment area, German shepherds and Dobermans were the most aggressive breeds. These findings are similar to other reports (Table 4). However, every breed poses the threat of dog bites; any dog may attack. Our data show that not only a proper education of dog owners and behavioral training of dogs are required for "high-risk" breeds; rather, legislation should regulate training of all dogs and dog owners and leashing

TABLE 4 Review of Several Dog-Bite Reports Identifying the Dog Breed That Caused the Most Incidents

Author	Year	No. of Cases	Dog Breed That Caused Most Incidents
Avner and Baker ¹³	1991	168	German shepherd
Greenhalgh et al ¹⁴	1991	159	German shepherd ^a
Unshelm et al ¹⁵	1993	284	German shepherd
Gershman et al ¹⁶	1994	178	German shepherd
Thompson ¹⁷	1997	356	Doberman ^a
Gandhi et al ¹⁸	1999	67	Pit bull
Reuhl et al ¹⁵	2001	20 (deaths)	German shepherd
Kahn et al ¹⁶	2003	100	German shepherd ^a
Mitchell et al ¹⁹	2003	44	Rottweiler
Schalamon et al	2004	341	German shepherd ^a

In all studies that were based on dog population, German shepherd and Doberman are the breeds that are most likely to be involved in dog-bite accidents.

^a Based on dog population.

of dogs when using public areas. Improved skills of dog owners and better training of the dogs may have prevented several of the reported attacks. Concordant with the findings of other authors,^{2,4} a peak incidence of dog attacks was noted during the summer months. This may be explained by the fact that on warm, summer days, children as well as dogs are more active and tend to play outside, increasing the possibility of encountering each other. Running past dogs or startling the dog can trigger a possible attack.

A majority (73%) of the attacking dogs in the present report were familiar to the children. However, only 33% of these familiar dogs were "household members." Furthermore, the children interfered with the dog in a majority of the cases. In addition to well-known situations such as disturbing a dog while eating or pulling its tail, running or cycling past the dog without direct contact provoked several attacks. Children likely feel comfortable with dogs that they know and therefore may reduce distance and lose respect, not realizing that this attitude may not be reciprocated. Small dogs attacked small children significantly more frequently than older children, presumably because small dogs are more likely to feel superior to little children.

Borud and Friedman¹⁰ discussed possible prevention

strategies in their report about dog bites in New York City. They recommended behavioral modification, especially of children, when interacting with a dog. Despite being helpful in adolescents, this approach may fail in younger children. This is important as the incidence of dog bites in the present report was highest in 1-year-old children. Because of the accumulation of dog bites in younger children, we agree with Thompson et al¹⁷ that parents should postpone purchase of a dog until children are of school age. Throughout evolution, dogs have lived in packs with a specific order of dominance. In view of this rigorous hierarchical system in a pack, dogs may regard newborns as well as toddlers as subordinate. Thus, they may feel the need to defend their own position in the pack against this intruder, especially if a new child enters the family while the dog is already an integrated member. School-aged children can be trained successfully in precautionary behavior when approaching a dog. Chapman et al¹¹ conducted an educational program in 8 Australian primary schools. Children who had received the training displayed significantly greater precautionary behavior than children in the untrained group. Despite possible training programs for school-aged children, it still seems to be more reasonable to teach the dog owners and parents to pay attention when children are close to dogs than to place the blame/responsibility for a dog attack on the children. Table 5, which includes the recommendations of Presutti¹² and Voelker,¹ summarizes a code of behavior to prevent dog bites.

CONCLUSIONS

Dog bites in children are more prevalent in certain dog breeds. Specific circumstances such as breed-related behavior of dogs and behavior of dog owners, children, and parents seem to increase the risks for dog bites. Therefore, prevention strategies should focus on public education and training of dogs and their owners. Children who are younger than 10 years represent the high-risk group for dog attacks.

TABLE 5 Code of Behavior When Handling a Dog

Dogs	Humans
Dogs sniff as a means of communication.	Before petting a dog, let it sniff you.
Dogs like to chase moving objects.	Do not run past dogs.
Dogs run faster than humans.	Do not try to outrun a dog.
Screaming may incite predatory behavior.	Remain calm if a dog approaches.
The order of precedence needs to be in evidence.	Do not hug or kiss a dog.
Direct eye contact may be interpreted as aggression.	Avoid direct eye contact.
Dogs tend to attack extremities, face, and neck.	If attacked, stand still (feet together) and protect neck and face with arms and hands.
Lying on the ground provokes attacks.	Stand up. If attacked while lying, keep face down and cover the ears with the hands. Do not move.
Fighting dogs bite at anything that is near.	Do not try to stop 2 fighting dogs.

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Analysis of Dog Bites in Children Who Are Younger Than 17 Years
Johannes Schalamon, Herwig Ainoedhofer, Georg Singer, Thomas Petnehazy,
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Dog Bites in Urban Children

Jeffrey R. Avner, MD, and M. Douglas Baker, MD

From the Division of General Pediatrics (Emergency Medicine), The Children's Hospital of Philadelphia and Department of Pediatrics, University of Pennsylvania School of Medicine, Philadelphia, Pennsylvania

ABSTRACT. As a result of a perceived increase in pit bull injuries, all children who presented to The Children's Hospital of Philadelphia during 1989 for evaluation of dog bite injuries were prospectively studied. Epidemiologic information was collected from parents, either at the time of visit or by phone on the following day. A total of 168 children were enrolled; the mean age was 8 years. Males outnumbered females 1.5:1. Most (61%) injuries occurred in or around the home and involved dogs known to the patient (77%). Types of injuries included abrasions (33%), punctures (29%), and lacerations (38%). Thirteen bites had associated complications; nine developed infection. Twelve (7%) children required admission to the hospital. More than 12 different purebreds or cross-breeds were identified as perpetrators, including German shepherds ($n = 35$), pit bulls ($n = 33$), rottweilers ($n = 9$), and Dobermans ($n = 7$). Most (54%) animals were contained (ie, leashed, fenced, in-house) at the time of injury. Fewer (46%) were provoked prior to biting. Significantly more pit bull injuries (94% vs 43%, $P < .001$) were the consequence of unprovoked attacks and involved freely roaming animals (67% vs 41%, $P < .01$). Children aged 5 or younger were more likely to provoke animals prior to injury than were older children (69% vs 36%, $P < .001$). It is recommended that families with young children be the target of pet safety education and that measures be sought that would lead to early identification of a potentially dangerous dog and restrict ownership. *Pediatrics* 1991;88:55-57; dog bite, pit bull, injury.

victims are children.⁵⁻⁷ Recent publicity in the lay press has focused on vicious dog attacks on humans and what should be done about them (*US News and World Report* April 20, 1987:24; *Time* July 27, 1987:60; *Sports Illustrated* July 27, 1987:72). These stories have sought to implicate a particular breed of dog and served to stir public uproar for "dangerous dog" laws and specific bans against ownership.

Sacks et al⁸ recently published a report on dog bite-related fatalities from 1979 through 1988. They identified 157 deaths; 70% occurred among children who were younger than 10 years of age. Pit bull breeds were the most commonly cited breed, accounting for 42% of deaths where a dog breed was reported. The proportion of deaths attributed to pit bulls increased from 20% in 1979 and 1980 to 62% in 1987 and 1988. Furthermore, pit bull attacks were almost twice as likely to be caused by strays as attacks by other breeds.

The aim of our study was to investigate the epidemiologic characteristics of dog bite injuries seen in an urban pediatric emergency department. We sought to determine what role was played by the age of the child, the breed of the dog, and whether the dog was freely roaming.

METHODS

From January 1, 1989, to December 31, 1989, all children younger than 19 years of age who presented to The Children's Hospital of Philadelphia Emergency Department for evaluation of dog bite injuries were enrolled. Demographic data, location of the injury, type of injury, and circumstances of the attack were collected at the time of the injury. A bite was considered provoked if it resulted from child-initiated interaction with the dog, such as playing with the dog or annoying the dog during his meal.

Information concerning the breed of dog was collected from police, paramedics, or parents, either

Animal bites are common childhood occurrences which represent between 0.5% and 1.5% of all emergency room visits.¹⁻⁴ In particular, dog bites have been estimated to account for up to 90% of all animal bites in this country,^{2,3} and the majority of

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Reprint requests to (J.R.A.) Jacobi Hospital, Room 1W20, Pelham Pkwy & Eastchester Rd, Bronx, NY 10461.
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at the time of the visit or by phone the following day. Their description of the breed was accepted as being accurate.

Data organization and analysis was done on the Epi Info System developed by the Centers for Disease Control.⁸ χ^2 was used to compare categorical data.

RESULTS

During the calendar year of 1989 there were 168 separate dog bite-related injuries seen in The Children's Hospital of Philadelphia Emergency Department. This represented 0.3% of all Emergency Department visits during that period. Of the 168 patients enrolled, 60% were boys and 81% were black. The mean age was 8 years (range: 7 months through 17 years). Sixty-five percent of the bites occurred during the spring and summer months (April to September). All bites occurred in either Philadelphia ($n = 165$, 98.2%) or in the adjacent New Jersey suburbs ($n = 3$, 1.8%).

More than 12 different purebreds or crossbreeds were identified as perpetrators (Table 1). The two unknown breed cases were known for all other variables and were included in all analyses except when breeds of dog were compared. Thirty-eight percent of the injuries were lacerations, 33% were abrasions, and 29% were puncture wounds. Thirteen bites had associated complications: nine infections, two partial amputations of a digit, one muscle injury, and one tendon rupture. Twelve children (7%) required admission to the hospital.

Most of the animals (55%) were contained at the time of the injury either by a leash (4%), by a fence (10%), or inside a house (41%). Sixty-one percent of the injuries occurred in or around the home and 77% involved dogs known to the patient. In addition, 46% of the dogs were provoked prior to biting.

Circumstances of the dog attack by the breed of dog are shown in Table 2. Compared with all other dog bites, where a breed of dog was identified, significantly more pit bull injuries were the consequence of unprovoked attacks and involved freely roaming animals. The number of complications, infections, or hospital admissions did not vary by breed of perpetrator.

Children aged 5 years or younger were more likely both to be bitten in their own home and to provoke the dog prior to injury than were older children (Table 3). In addition, younger children were usually bitten on the head and older children on an extremity.

TABLE 1. Breed of Dogs Involved in Attacks

Breed of Dog	No. (%) of Attacks
Pure breeds	
German shepherd	35 (20.8)
Pit bull	33 (19.6)
Rottweiler	9 (5.4)
Doberman	7 (4.2)
Terrier	6 (3.6)
Husky	5 (3.0)
Other	10 (6.0)
Mixed breeds	61 (36.3)
Unknown	2 (1.2)

TABLE 2. Circumstances of Dog Attack by Dog Breed*

	Pit Bull (n = 33)	German Shepherd (n = 35)	Other Pure Breeds (n = 37)	Mixed (n = 61)
Unprovoked	31† (94)	15 (43)	15 (41)	27 (44)
Freely roaming	22‡ (67)	20 (57)	14 (38)	20 (33)
Known to child	23 (70)	23 (66)	31 (84)	47 (77)

* Results are given as number (percent). P values compared to all other dog bites where a breed was known. Two dogs, whose breeds were unknown, were excluded.

† $P < .001$.

‡ $P < .01$.

TABLE 3. Characteristics of Dog Bites by Patient Age

	No. (%) Aged ≤ 5 y (n = 54)	No. (%) Aged > 5 y (n = 114)	P Value*
Provoked	37 (69)	41 (36)	$< .001$
In or around home	31 (57)	35 (31)	$< .001$
Known to child	43 (80)	86 (75)	NS
Body part bitten			
Face, scalp	27 (50)	17 (15)	$< .001$
Trunk	3 (6)	8 (7)	NS
Extremity	24 (44)	89 (78)	$< .001$

* NS, not significant.

DISCUSSION

Dog bite injuries remain a constant problem in this country and are the source of significant morbidity and mortality in the pediatric age group. This problem is unlikely to diminish because changing social trends have led to the training and keeping of dangerous animals. Urban families may purchase aggressive guard dogs for self-protection⁹; vicious dogs are often bred or trained for dog-fighting events¹⁰; and ferocious breeds such as pit bulls have become increasingly popular among drug dealers (Time July 27, 1987:60).

Our study supports earlier work^{5,6} implicating the pit bull as a common cause of dog bite injuries in children. Although German shepherds were the most commonly cited dog breed, the circumstances

surrounding pit bull injuries require special attention. Ninety-four percent of pit bull injuries in our study were the consequence of unprovoked attacks, and 67% of pit bull injuries involved freely roaming animals. It is true that recent media attention devoted to the aggressive nature of pit bulls might have led to misclassification of the breed by the reporting person and an overreporting of pit bulls as the offending dog. However, inasmuch as 77% of the involved dogs were known to the patient, their accuracy of breed identification should be high. Unfortunately, the absence of reliable dog breed-specific population figures prevents the calculation of breed-specific injury rates. Still, the number of pit bull injuries seems disproportionately high. The absolute number of pit bull injuries alone warrants concern, particularly because 94% were not the "fault" of the injured party.

The tendency of a dog to bite is a product of many factors including genetic predisposition to aggression, early socialization to people, training or maltreatment, quality of care and supervision, and behavior of the victim.¹⁰ Therefore, prevention of dog bite injuries in children must include a variety of approaches. One strategy is the prevention of unprovoked attacks through implementation of severe restrictions on ownership of vicious dogs and prevention of aggression training. Most existing laws are reactive, holding the owner responsible for the dog's actions if the owner had knowledge of the dog's "vicious propensity." There remains little effort to identify a potentially dangerous dog until after someone has been injured.¹⁰ Often there are preexisting circumstances which identify overly aggressive and dangerous dogs, such as a prior unprovoked serious injury to a human or domestic animal or being trained for dog fighting.¹⁰ New legislation should be sought which incorporates this information into a conscientious animal ownership plan. This plan should include an efficient recording system for keeping track of breed ownership, dog bite injuries, and aggressive training or behavior. In addition, the number of injuries involving dogs who were freely roaming suggests that such legislation should include an increased effort to remove stray dogs and encourage owners to properly contain their animals.

Our study also confirms that the younger child is more likely to be the victim of a provoked attack, at home, by a familiar dog. Some have suggested that the younger child may not realize that playful actions may cause an angry or defensive reaction from an otherwise friendly pet.¹¹ Others speculate that behavior not generally regarded as provocative may be interpreted by a dog as an invasion of territory and may incite an attack.¹¹ Education is needed to remind parents that their own dog or their neighbor's dog may pose danger to their children. Young children, in particular, are more likely to provoke a known dog in their own home and, therefore, should be the target of anticipatory guidance. Furthermore, infants and young children should never be left unsupervised around any dog, no matter how well known the dog is or how friendly the dog may appear.

Based on our data, we recommend that measures should be sought which would lead to early identification of a potentially dangerous dog and restrict ownership and that families with young children should be the target of pet safety education.

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Severe Dog Bites in Children

Thomas V. Brogan, MD*; Susan L. Bratton, MD*; M. Denise Dowd, MD†; and Mary A. Hegenbarth, MD§

ABSTRACT. *Objective.* We evaluated children less than 16 years of age who had dog bite injuries that resulted in hospitalization or death to determine the typical characteristics of the children, the dogs, and the injuries suffered.

Design. Retrospective chart review.

Setting. Three large city hospitals including Harborview Medical Center, Seattle, Washington; Children's Mercy Hospital, Kansas City, Missouri; and Mary Bridge Hospital, Tacoma, Washington.

Methods. Charts were reviewed for patient demographic data and canine data. Hospitalization data included total length of stay, need for intensive care, Injury Severity Score, the nature and extent of the injuries, procedures performed, complications, and outcome.

Results. Forty cases were reviewed. Most children were boys (60%) and were white (87%). The median age was 50 months. There were three deaths. Most dogs were medium-sized or large breeds and were familiar to the victim. The average hospital stay was 6 days (SD = 5), and 12 (30%) patients required a stay in the intensive care unit. Injuries to the face, head, and neck area were most common (82%). Major surgical procedures included craniotomy, exploration of the neck or abdomen, ocular procedures, and repair of fractures.

Conclusions. Severe dog bites in children occur most frequently in those younger than 5 years old and involve the head and neck. Large dogs that are familiar to the child are usually involved. Young children should be closely supervised when around any dog. *Pediatrics* 1995; 96:947-950; dog bites, trauma, intracranial hemorrhage, fractures, vascular disruption, prevention.

Dogs are important in our culture, bringing joy and aid to many people. However, dog bites represent an important health care problem, ranging from trivial to fatal injuries, that is often unappreciated by the general public. Many bites go unreported, making precise incidence measurement impossible¹; however, estimates suggest that between 500 000 to 2 million dog bites occur per year.^{2,3} The majority of victims are children.¹⁻⁷ Although most victims never seek medical care, dog bites still account for approximately 1% of emergency department visits in the United States⁸ and are a common childhood health problem.

Although studies have evaluated fatal dog attacks,^{4,5} no systematic description of children who

required hospitalization for their injuries has been reported. The aim of our study was to characterize severe dog bites, defined as those bites that result in hospitalization or death, at three urban pediatric trauma centers.

METHODS

We reviewed the charts of all patients aged 0 to 16 years admitted with the diagnosis of acute dog bite and children who died in the emergency department from dog bite injuries between January 1985 and April 1994 at Harborview Medical Center, Seattle, Washington, and Mary Bridge Hospital, Tacoma, Washington. The same data were reviewed at Children's Mercy Hospital, Kansas City, Missouri, from May 1987, when the trauma registry was first instituted. Patients were identified through trauma registries or medical records (Mary Bridge Hospital). Severe dog bites were defined as those that resulted in acute hospitalization or emergency department mortality. Children who required medical care for later complications of dog bite injuries such as infections were excluded.

Charts were reviewed for patient demographic data and the following items, when recorded in the medical record: dog breed, relationship to the victim, site of the attack, where the dog was kept at the time of the bite, and disposition of the dog. Records were reviewed for total length of stay, need for intensive care, Injury Severity Score,⁶ the nature and extent of the injuries, procedures performed, acute complications arising from the bite or the hospitalization, long-term complications, and outcome.

Data are reported as mean $\pm$ standard deviation unless specified otherwise.

RESULTS

Patient Demographics

The charts of 40 children were reviewed: 23 children from Harborview Medical Center, 12 from Children's Mercy Hospital, and 5 from Mary Bridge Hospital. Thirty-eight patients were admitted to the hospital, and two of the three patients who died did so in the emergency department. Twenty-four patients (60%) were male. The median age was 50 months and the mean age was 58 ± 42 months; ages ranged from 5 days to 15 years. Analysis of race revealed 34 whites, 3 Native Americans, 1 African American, 1 Hispanic, and 1 Asian-Pacific Islander.

The three children who died of their injuries were a 5-day-old boy, a 17-month-old boy, and 5-year-old girl.

Canine Characteristics

Forty-three dogs were involved in 40 attacks. The majority were large breeds. The most common breeds were the German shepherd and German shepherd mix ($n = 15$). These and the remaining breeds are listed in Table 1. The dogs involved in the fatal attacks were two rottweilers (same attack), one husky, and one akita.

Most victims were familiar with the dog. Twenty-one dogs belonged to a neighbor, and 13 dogs were

From *Pediatric Anesthesia and Critical Care and †Pediatrics and Harborview Injury Prevention and Research Center, University of Washington School of Medicine, Seattle, Washington; and §Division of Emergency Medicine, Children's Mercy Hospital, University of Missouri School of Medicine, Kansas City, Missouri.

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TABLE 1. Demographic Characteristics of the Dogs and Owners (N = 43*)

Breed†	
German shepherd	10 (22%)
German shepherd mix	5 (11%)
Rottweiler	7‡ (16%)
Pit bull	4 (9%)
Husky	3 (7%)
Husky mix	1 (2%)
Wolf mix	3 (7%)
Labrador retriever	1 (2%)
Akita	1 (2%)
Doberman	1 (2%)
Australian shepherd	1 (2%)
Chow	1 (2%)
Malamute	1 (2%)
Unknown	6 (13%)
Owner	
Neighbor	21 (49%)
Household member	13 (30%)
Stray	3 (7%)
Guard dog	2 (5%)
Police dog	1 (2%)
Unknown	3 (7%)
Location of attack	
In a house	12 (30%)
In the child's or a neighbor's yard	8 (20%)
Neighborhood	6 (15%)
Street	2 (5%)
Riding stables	1 (2%)
Unknown	11 (27%)

* Three cases involved two dogs in a single attack.

† Two attacks involved two rottweilers.

‡ There are 45 dogs because 2 mixed-breed dogs had both breeds listed.

from the immediate household (Table 1). Only three dogs were strays. The dogs were kept in a variety of settings at the time of attack. Nine dogs were in the home. Seven dogs were outside in a fenced area, six dogs were leashed outside (two broke the leash before the attack), and two dogs were loose on the street. In 16 cases, the location of the dog was unknown or not recorded.

The site of the biting was available in 29 charts, and most attacks were in a site familiar to the victim (Table 1). The interior of the child's or a neighbor's house was the most frequent site (n = 12), followed by the victim's or a neighbor's yard (n = 8). The neighborhood, not further specified, was cited in six cases, and the street was specified in two cases.

The disposition of the dog was recorded in 25 cases. In 10 cases, the dogs were destroyed; in 15 cases, the dogs were immediately removed, two permanently. Eight were returned after a period of observation, and in five cases, the ultimate disposition after removal from the home was unknown.

Hospital Data

In total, three children died, two in the emergency department despite resuscitation efforts (including one patient who received open-chest cardiopulmonary resuscitation) and one shortly after admission to the intensive care unit. The mean hospital stay for survivors was 6 ± 5 days, with a range of 1 to 32 days. Twelve patients required intensive care, with an average stay of 2 ± 1 days. The range of stay in the intensive care unit was 1 to 5 days. The mean Injury Severity Score was 8 ± 6 , with a range of 1 to 25.

There is significant mortality and morbidity among children associated with scores above 25, but both drop off rapidly below that score.⁹

The most common sites of injury were the head, face, and neck (n = 33) (Figure). Extremity involvement and truncal injury were less common (n = 16 and n = 15, respectively) (Table 2). Sixteen children had more than one anatomic region injured. All three children who died had multiple wounds, with significant hemorrhage and intracranial trauma.

All children suffered soft-tissue injuries, the majority of which were lacerations and abrasions. Soft-tissue avulsion was a frequent finding; sites included the scalp (n = 6), external ear (n = 3), and facial tissue (n = 2). In addition to soft-tissue injury, 16 children suffered fractures. The most frequent sites of fracture were the skull (n = 8) and the facial bones (n = 5). Among the eight patients with skull fractures, six had depressed fragments, with three underlying cerebral contusions and three subdural and one epidural hemorrhages. One patient with facial injuries had a complex fracture involving three bones near the nose and orbit. Injuries of the orbit included fractures (n = 2) and nasolacrimal duct injuries (n = 6). Five patients had intracranial hemorrhages.

All children required irrigation, debridement, and repair of their lacerations. A number of children required further procedures, including emergent craniotomy for repair of skull fractures (n = 6) and closure of dural tears (n = 5). Eight children required ophthalmologic consultation for procedures including cannulation of the nasolacrimal duct (n = 6), repair of the eyelid (n = 4), and fixation of orbital ridge fractures (n = 2). In addition, six victims had surgical exploration of the neck. Two required repair of the internal jugular vein, and two others had the vessel ligated. One patient had abdominal exploration. Three patients required more than one surgical intervention. Six surviving patients had long-term complications, and seven had short-term complications (Table 2).

DISCUSSION

The hospitalized children we report were victims of severe dog bites; almost one third required treatment in an intensive care unit, and three died. Dog



Figure. Face of a toddler who suffered soft-tissue avulsion as a result of a dog bite.

TABLE 2. Injuries, Procedures, and Outcome (N = 40)

Injuries	
Site*	
Head and neck	33 (82%)
Trunk	15 (38%)
Extremities	16 (40%)
Type	
Soft tissue	40 (100%)
Fractures	16 (40%)
Eye	10 (25%)
Dural tear	5 (12%)
Intracranial hemorrhage	5 (12%)
Ear avulsion	3 (8%)
Amputation	1 (3%)
Surgical procedures	
Irrigation and debridement	40 (100%)
Craniotomy	6 (15%)
Neck exploration	6 (15%)
Dural repair	5 (12%)
Eye repair	8 (20%)
Nasolacrimal duct repair	6 (15%)
External ear repair	2 (5%)
Laparotomy	1 (3%)
Outcome	
Death	3 (8%)
Complications	
Amputation of forearm	1 (3%)
Ear avulsion	1 (3%)
Diplopia	1 (3%)
Hypertrophic facial scar	1 (3%)
Torticollis	1 (3%)
Post-traumatic stress disorder	1 (3%)
Blood transfusion	3 (8%)
Infection	3 (8%)
Morphine overdose	1 (3%)

*Sixteen patients had multiple anatomic regions involved.

bites occur in all age groups, but most frequently afflict the very young and the very old.¹⁻⁷ These same populations also suffer the most severe attacks.^{4,5} Approximately 10 to 20 fatalities occur each year in the United States from severe dog bites.⁵ In terms of reported bites, large-breed dogs appear to be the most common aggressors.¹⁻⁷ In most cases, the dog belongs to the family or a neighbor and is known to the victim. Strays infrequently bite people.¹⁻⁷

The most striking feature in this group of children was the frequency (82%) and severity of head and neck injuries, which were more common than in other studies.^{6,10-13} Among children less than 5 years of age, 88% had injuries of the head. Wounds of the head, face, and neck region often went beyond simple soft-tissue injuries such as lacerations and abrasions. One quarter of children suffered fractures of the skull or facial bones and 12% had intracranial hemorrhages. Consequently, wounds to the head, face, and neck areas require investigation for skull or facial fractures and intracranial lesions. In addition, 22% of our patients had ocular injuries. Therefore, inspection for ocular or orbital injury, including the nasolacrimal duct, must be emphasized when wounds are found on the face. We found that the extent and frequency of bony-tissue injuries, intracranial complications, and ophthalmologic lesions have not been appreciated in other studies of severe dog attacks.^{10,13}

Young children are more prone to severe dog bites involving the head, face, and neck area for several reasons. First, because of their small stature, the children's head and neck are in immediate proximity to

many attacking dogs. Second, the undeveloped motor skills of these youngsters, and the relatively large size of the head in comparison with the body, afford little or no defense against attack. Third, young children often demonstrate a willingness to bring their faces within the area perceived as an intimate and threatening distance by dogs, which increases the likelihood of attack.¹² Finally, face and neck biting of children may be an extension of the face and mouth-biting behavior of dogs with each other in learning dominance behavior.¹⁴

Injuries to the extremities and the trunk were less common in our series compared with children with less severe dog bite injuries.¹⁻³ Finally, superficial wounds of the neck may herald underlying vascular lesions. In our series, 15% required surgical exploration and 10% had vascular injury that required repair or ligation.

Our data highlight the vulnerability of young children and infants to dog bites. In this study, 62% of the patients were less than 6 years old, and 92% were 10 years old or younger. In contrast, other studies of less severe attacks found that children from 5 to 10 years old were the most commonly bitten group^{2,3,6,11} (Table 3). Consistent with most other studies, the majority of the children were boys (60%).²⁻⁷

Prevention of dog bites is an obvious goal. The biting dogs in this study illustrate many of the features of dogs described in previous reports, and this provides the basis for an approach to prevention. Most important, any dog that perceives itself to be threatened is capable of biting. Most biting dogs are medium and large breeds (Table 1).^{1-7,11,15} Large dogs are primarily responsible for more severe injuries. A number of studies have attempted to define the most frequently aggressive breeds. The one case-control study did show that German shepherds and chow chow are more likely to bite than other breeds.¹¹ However, precise population prevalence figures are extremely difficult to ascertain because of incomplete registration, inaccurate description, and incomplete reporting of biting dogs. Prevalence figures are also limited by frequent shifts in the popularity of different breeds. Thus, it may be more appropriate to establish the spectrum of frequently aggressive breeds with the caveat that any dog may be aggressive when threatened.

Both dog owners and adults who care for children must be educated to the range of situations and behaviors that elicit aggressive responses from dogs. Dog behavior appears complex and erratic to the untrained observer. Canine aggressiveness may stem from a number of diverse motives, including inadequate socialization, fear, territoriality, dominance behavior, jealousy, or even overbreeding.¹⁴⁻¹⁸ Dogs may misinterpret human gestures that are related to dominance signals and, thus, are threatening to the dog.¹⁴ Dominance aggression usually occurs in relation to persons well known to the dog and most often in familiar surroundings.^{14,17} Aggression near the dog's home may also contain an important component of territoriality. In contrast, strays are usually wary of humans and are rarely aggressive. However, many people continue to believe the contrary and

TABLE 3. Dog Bite Victims: Demographics and Presenting Injuries From Prior Reports*

First Author	N	Age, y		Head/ Neck	Breed		
		<1	<10		German Shepherd	Husky	Pit Bull
Sacks [†]	157	16	70	70	14.8	11.9	41.6
Pinckney [†]	74	3	85	85	19.8	8.5	NR
Tuggle [§]	13	0	100	100	NR	NR	NR
Lauer [¶]	194	7	71	71	17.5	NR	NR
Wiseman	57	NR	NR	NR	NR	NR	NR
Avner	168	NR	NR	NR	20.8	3	19.6
Chun	199	0	NR	NR	NR	NR	NR
Daniels	722	NR	12	42.1	NR	NR	NR
Gershman	178	NR	50	<50	19.1	NR	NR

* Abbreviation: NR, not reported in the study.

† Database review.

§ Retrospective chart review.

¶ Literature and media review.

|| Patient questionnaire.

|| Prospective study.

|| Prospective case-control study.

perceive that strays are more likely to be aggressive. Perhaps because of this misconception, the diligence of supervising adults may wane in the presence of a familiar dog, leaving their child at risk for injury. Children may also have less fear of dogs that they have seen on previous occasions and may place themselves at greater risk.

Parents and dog owners must assure adequate supervision of children, especially infants and toddlers, at all times in the presence of dogs, even the family dog. Also, parents must teach their children to treat all animals with respect, which includes never hurting, teasing, or taking things from the dog. A significant portion (10%) of the children in this study and in previously reported fatalities from dog bites were less than 1 year of age and cannot be expected to protect themselves from an attack. The infants in our study emphasize the importance of never leaving an infant or toddler alone with a dog and may also provide the groundwork for anticipatory guidance regarding the appropriate timing for obtaining a family dog.

Finally, education must be given to dog owners. Aggressive and dominant behavior must be recognized early; prevention is easier than retraining. Consultation with a veterinarian should be sought whenever questions of aggression in a dog arise. Dogs with prior histories of attacking humans or other animals must be considered aggressive, and efforts should be redoubled to prevent further aggression through training and appropriate handling of the dog.¹⁷ Although the dogs' histories were not specifically examined, two charts in this series listed previous attacks by the dogs involved. Leash laws may reduce the number of free-ranging dogs and dogs who escape their yards,¹⁶ but have no effect on dog bites that occur in the home or by chained or fenced dogs. Such restraints may actually increase the aggressiveness of some dogs.^{17,19} Thus, dog owners must pay meticulous attention to a dog's physical world and care for its social and biologic needs to reduce the risk of dog bites.

In summary, dogs usually bite familiar people near their homes. Injuries to the head, neck, and face area are common in young children and often result in

significant trauma that may require hospitalization. Evaluation and treatment may require medical, radiologic, and surgical modalities. Education should be aimed at dog owners, parents, children, and local authorities to avoid this preventable form of trauma.

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Effect of Urine Latex Agglutination Tests on the Treatment of Children at Risk for Invasive Bacterial Infection

Penny M. Adcock, MD*; Ronald I. Paul, MD†; and Gary S. Marshall, MD*

ABSTRACT. *Background.* Identifying febrile children with invasive bacterial infection is difficult in the absence of telltale physical findings. Urine latex agglutination (ULA) tests have been used for rapid, on-site identification of such children.

Objectives. To study the performance of ULA tests in identifying children with *Haemophilus influenzae*, *Streptococcus pneumoniae*, and group B streptococcus infection and to examine how the results of ULA tests affect patient treatment.

Design. Retrospective review.

Setting. Urban children's hospital.

Patients. All emergency department and hospital patients tested by ULA in 1990, excluding patients in the neonatal units.

Results. Of 1629 patients, 36 had positive tests (20 *H. influenzae*, 5 *S. pneumoniae*, and 11 group B streptococcus). Thirteen of these were false positive based on culture results. Although ULA tests demonstrated excellent specificity, their sensitivity was poor. Positive predictive values for bacteremia ranged from 0.346 to 0.600, and negative predictive values ranged from 0.972 to 0.997. The decision to treat with antibiotics was made before ULA test results were available in 19 (53%) of the 36 patients with positive test results. Of 1593 patients with negative test results, 1211 (76%) were admitted to the hospital, and approximately 81% were empirically treated with parenteral antibiotics.

Conclusions. In clinical practice, treatment and disposition decisions are frequently made without regard to ULA test results. *Pediatrics* 1995;96:951-954; *occult bacteremia, serious bacterial infection, latex agglutination test, Haemophilus influenzae, Streptococcus pneumoniae, group B streptococcus.*

ABBREVIATIONS. CSF, cerebrospinal fluid; ULA, urine latex agglutination; GBS, group B streptococcus.

Identifying febrile children who have serious bacterial infections can be problematic, especially when diagnostic physical findings are absent. For example, the classic occult serious infection in febrile children, bacteremia, occurs with a frequency of 2% to 12%, depending on the population studied.¹⁻⁶ Because identification of children with occult bacteremia necessarily awaits blood culture results, which can take

several days, treatment strategies have focused on routine laboratory predictors of bacteremia⁷ and expectant therapies.⁸ Unfortunately, whereas routine laboratory methods (eg, white blood count and differential) may be sensitive for bacteremia, they are inherently nonspecific, because they detect epiphenomena of infection rather than infectious organisms per se. In addition, concerns have been expressed regarding the routine implementation of expectant treatment strategies using intramuscular antibiotics on an outpatient basis.⁹

Latex particle agglutination tests were developed to provide rapid, on-site identification of children infected with common bacterial pathogens by detecting capsular polysaccharide antigens in body fluids. These tests use microscopic latex beads coated with organism-specific antisera that visibly agglutinate in the presence of the appropriate bacterial antigens. Whereas latex agglutination tests can be applied to serum or cerebrospinal fluid (CSF), urine is often considered the best specimen, because antigens are concentrated there. Previous studies have demonstrated good specificity but variable and often poor sensitivity of urine latex agglutination (ULA) tests in identifying children with serious bacterial infections. Although data on test performance parameters exist, very few studies have examined what effect ULA tests have on patient treatment. The purpose of this study was to determine the performance of ULA tests as they are used in clinical practice, and to examine how the results of the ULA tests affect patient disposition and empiric therapies.

METHODS

The Directigen ULA test (Becton Dickinson, Cockeysville, MD) was routinely used at Kosair Children's Hospital for the detection of *Haemophilus influenzae*, *Streptococcus pneumoniae*, and group B streptococcus (GBS) infection for several years. The test was performed in the clinical immunology laboratory according to the manufacturer's instructions. We reviewed laboratory log sheets to identify all patients tested by ULA in 1990. Patients whose specimens originated either from the emergency department or hospital ward were included. Specifically excluded were patients admitted to the healthy newborn nursery and the neonatal intensive care unit. Duplicate specimens from a patient during the same illness were not included in the analysis.

Computerized databases were searched for bacterial culture results and information on patient disposition. Charts of all patients with positive ULA test results were reviewed in detail in an attempt to determine the effect of test results on patient treatment. Data from these charts were extracted onto standardized forms by one of the authors. Specifically included on these data sheets was the time the ULA specimen was received in the laboratory (recorded electronically by the laboratory computer system) and the time the patient received antibiotics (recorded manually by the

From the Divisions of *Infectious Diseases and †Emergency Medicine, Department of Pediatrics, University of Louisville School of Medicine, Louisville, KY.

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Reprint requests to (G.S.M.) Division of Pediatric Infectious Diseases, University of Louisville School of Medicine, Louisville, KY 40292.

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Dog bites to humans—demography, epidemiology, injury, and risk

Karen L. Overall, MA, VMD, PhD, DACVB, and Molly Love, MSN

Dog bite injuries to humans have recently received much attention, probably because the impact of these injuries has finally been recognized.¹⁻³ During the 1940s and 1950s, the medical and public health monetary costs of domestic animal bites were reported to be between \$1 and \$5 million.⁴ One report cites a current annual cost of \$102.4 million for dog bite-related emergency services in the United States.⁵ Recent estimates indicate that hospitalization costs are approximately \$62.5 million, raising the total direct medical care cost to \$164.9 million.⁷ During the first half of the 1990s, US insurance companies paid mean annual claims in excess of \$1 billion for dog bite-related injuries, and a third of all liability claims associated with home owners were dog bite-related.^{8,9} Ancillary costs (eg, lost income, torn clothing) were estimated in the 1970s to total \$25 million annually in the United States.¹⁰ The dogs involved are affected too, because bite incidents, like other behavioral problems, often result in euthanasia or relinquishment of pets to shelters.¹¹⁻¹³ Furthermore, there are direct and indirect adverse economic effects on the veterinary profession. These effects include direct loss of practice income caused by loss of patients and the possibility that fewer people will consider owning dogs because of negative publicity (indirect). The costs associated with these latter issues are not well-documented.

Some people have suggested that the incidence of dog bites could be reduced through legislative initiatives.¹⁴⁻¹⁸ If these initiatives are to be effective and reasonable, they must be based on accurate information about why and which dogs bite. The purpose of this report is to review major studies of the past 40 years that have focused on dog bites and critically evaluate factors related to victims (eg, age, gender, relationship to dog, activity, injury) and dogs (eg, age, gender, size, breed, behavior). Relevant aspects of normal canine behavior, genetic implications of breed development, behavioral conditions that can lead to dog bites, and misconceptions about these factors as they relate to dog bites are also explored.

Incidence of Dog Bites

There are between 52.9 and 58.2 million pet dogs in the United States¹⁹ that reside in approximately 35%

of all households.²⁰ Estimates of dog-bite incidence vary widely and range from 0.5 to 1 million bites/y (late 1950s through the early 1970s) to 3.5 to 4.7 million bites/y (late 1970s through the 1990s; Table 1).^{2,3,6,9,10,21-23,6} Data for other countries, when available, are similar.^{34,37}

The proportion of dog bites reported to medical or legal authorities appears to be low; published estimates range from 10 to 50%.^{22-25,38,39} Recent data from a national telephone survey⁴ provide an estimated overall incidence of 1,000 bites/1,000 people per year and an estimated incidence for those seeking medical attention of 2 bites/1,000 people per year. To the limited extent that the frequency of medically treated bite injuries can be used to estimate the frequency with which bites are reported, only about 17% of dog bites are reported.⁴ Therefore, accumulated data indicate that dog bites occur more often and that the frequency of bites reported to any authority (eg, hospital, animal control, Centers for Disease Control and Prevention) may be substantially lower than commonly believed.

Approximately 17 to 18% of dog bite injuries receive medical attention, and approximately 1 to 2% of bite injuries require hospitalization of victims.^{12,36,40,42} Dog bite-related injuries comprise 0.4 to 1.5% of emergency department visits,^{23,34,35,46} 1.2% of surgical cases seen in emergency departments, and 0.3 to 1% of emergency room visits by pediatric patients.⁴ Approximately 3.6% of emergency department visits by male children between 5 and 9 years old are dog bite-related.⁴

Current information about factors affecting dog bites may be biased, because most data used to assess these factors have been obtained from bite incidents that required medical or surgical treatment. The nature and magnitude of this bias is, of course, unknown. Usually, the age of the victim, the type of dog, the ownership status of the dog, and the type of human injury sustained are recorded, but information about canine and human behaviors surrounding the bite is rarely included. When such information is available, it is seldom recorded in a manner that allows critical comparison.

Demographics of Dog Bites

Effect of human's age—The type of human injury incurred from a dog bite depends on the physical attributes of the human and the dog. With few notable exceptions,⁴ available studies do not define what con-

From the Department of Clinical Studies, School of Veterinary Medicine, University of Pennsylvania, Philadelphia, PA 19104-6010.

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Table 1—Bite incidences as cited or calculated in published studies

Type of study	Incidence and time period (bites/population)	Comments Study reference*	Study reference*
Retrospective study of bites reported in Pittsburgh, Pa	362/100,000; July and August 1958	Animal bites. Most were inflicted by dogs but percentage not specified	6
Retrospective study of bites reported to a rabies control program, Norfolk, Va. Department of Health	281/100,000; 1971	6-month sampling period	24
Retrospective study of bites reported to the Baltimore City Health Department	288-480/100,000; 1953-1964	Calculated from dog-associated portion (95%) of animal bites reported in Baltimore, Md	29
Retrospective survey of victims of dog bites reported to the Baltimore City Health Department	467/100,000; 1969	For state of Maryland. Calculated from data, assuming dog bites constituted 95% of all reported animal bites	29
Retrospective survey of victims of dog bites reported to the Baltimore City Health Department	709/100,000; 1969	For city of Baltimore. Calculated assuming that dog bites constituted 95% of all reported animal bites	9
Retrospective study of bites reported to the New York City Health Department	353/100,000; 1965 361/100,000; 1966 376/100,000; 1967 407/100,000; 1968 419/100,000; 1969 457/100,000; 1970 475/100,000; 1971 483/100,000; 1972		25
Centers for Disease Control and Prevention prospective 2-year surveillance program covering 15 departments	20/100,000; 1971 in South Carolina 927/100,000; 1971 in Arizona 207/100,000; 1971-1972	207/100,000 was the mean rate for 12 states and 3 districts. Calculated assuming that dog bites constituted 83.8% of animal bites during this 2-year period	15
Retrospective study of bites reported to the Baltimore City Bureau of Animal Control	791/100,000; 1970-1976		30
Retrospective study of bites for which victims sought medical advice on 2 US Air Force bases	1,399/100,000; January 1976-December 1977	Authors noted that this was 1.7 times the incidence reported by Berzon and DeHoff	31
Retrospective study of bites reported through the Indian Health Service	596/100,000; 1981 697/100,000; 1982 539/100,000; 1983	Follow-up by telephone to obtain specific data	56
Retrospective study of bites reported to the Guelph Health Unit	160/100,000; 1986-1987		34
Retrospective telephone survey of past experience	18/1000; 1994	Estimated incidence	2
Retrospective telephone survey of past experience	3/1000; 1994	Estimated incidence rate of those receiving medical attention	2
Retrospective survey, National Center for Health Statistics	12.9/10,000; 1992-1994	Based on visits to emergency departments in United States	3

*Study reference refers to citation in reference list. Studies are listed in chronologic order in this table.

stitutes a bite and do not distinguish between minor injuries (eg, bruises) and more severe injuries (eg, punctures, lacerations).^{40,33,31,48} Data from reported bites requiring medical attention indicate that most dog bites affect children younger than 15 years old.²³ Other studies indicate that approximately 60 to 75% of those who are bitten are < 20 years old, and most are children 5 to 9 years old.^{34,49,50} After the age of 1 year, bite incidence increases through ages 5 to 9 years.^{14,33,29,50} If all bites are distributed equally over victim age, children are bitten 2 to 3 times more frequently than would be expected on the basis of their population proportion.² Estimates indicate that most children have been bitten by a dog, usually one known to them, by the time they are 11 years old.^{22,31,51} In 1 study involving

> 3,200 randomly chosen children 4 to 18 years old, 45% reported being bitten during their lifetime.³¹ Children are at least 3 times more likely to experience a medically attended bite than are adults,² and 48% of dog bite-related emergency room visits at 1 center were by children under 10 years old.²¹

Effect of victim's gender—Three types of study reports are available that examine the association between gender of victim and likelihood of being bitten: those containing actual data that allow relative risk to be calculated, those in which only calculated relative risk or odds ratios are reported, and those that include bite incidence without population data that would permit calculation of relative risk. Detailed data that per-

Table 2—Relative risk of dog bites for male and female victims in various age groups

Age	No. of human males bitten/No. of males in population	No. of females bitten/No. of females in population	G _{adj} ^a	Study reference ^c
0 to 4 y	101/31,390	73/30,622	3.988	8
5 to 9 y	185/25,123	104/24,566	21.400	
10 to 19 y	184/41,743	65/44,714	63.748	
All ages	638/328,407	308/348,399	137.927	
5 to 9 y	162/13,809	90/13,412	18.900	24
10 to 19 y	148/28,780	62/26,173	26.063	
20 to 24 y	33/50,753	28/25,077	4.333	
All ages	539/166,453	304/141,198	33.480	
Children	831/1,525	662/1,713	81.762	51
Children	58/1,825	34/1,685	4.662	2
Adults	63/2,882	31/2,554	9.729	

^aStudy number refers to citation in reference list. ^bG_{adj} is the log-likelihood ratio χ^2 test statistic. ^cP < 0.05 for all values listed.

mit comparison of relative risks of dog bites for male and female victims are available from 4 studies (Table 2).³² Males are bitten significantly more often than females for all age groups examined in each of these studies.

In reports of 13 other studies, the at-risk population cannot be determined; however, most of these studies indicate that male victims incur a significantly larger proportion of reported bites than do female victims.^{3,5,33,34,35,46,48,50,54-56} Dog bites to human males are reported 1.4³¹ to 3 times³ more frequently than are bites to human females.^{22,31} The ratio of males to females bitten ranged from 1.5:1¹⁶ to 1.7:1 for a population in which males outnumbered females 1.2:1.¹⁷ Proportions of bites to male children compared with female children vary with age of victim: boys outnumber girls 1.6:1 in the younger than 4 years age group and 2.3:1 in the 4- to 16-year age group.³⁹ When compared with females 19 years or older (relative risk, 1.0), males 19 years or older have a relative risk of 1.9, females 0 to 18 years old have a relative risk of 4.2, and males 0 to 18 years old have a relative risk of 5.4.³¹ This pattern indicates an interaction between age and sex that is consistent among various geographic and cultural locales.⁴⁰

In a 3-year annualized study of new dog bite injuries seen in US emergency departments, the highest incidence rate (60.7 bites/10,000 people) was for boys 5 to 9 years.^{34,39} Males were bitten significantly more often than were females in all age groups other than human males over 60 years old.⁶³ The only exception to this pattern was found on an Indian reservation where dogs were neither owned pets nor stray but took shelter where people worked.⁵⁷ These statistics strongly indicate that some patterns of interaction (possibly including play) between dogs and humans are gender-biased and that some aspects of these interactions may be conducive to aggression. The view that some bites are largely attributable to human behavior, whereas others are largely attributable to dog behavior, is indirectly supported by lack of a sex prevalence in 1 study that examines only severe attacks.⁴⁸ Many of the 16 incidents reviewed in that study involved predatory behaviors and chained animals, strongly indicating

that this group of dogs was a distinct subset of dogs that bite.

Finally, males comprise a significantly larger proportion of dog bite-related fatalities than do females.^{30,51,53-56}

Relationship of dog to victim—Most dog bite injuries in the United States are inflicted by owned pet animals and not by strays.^{31,36,61-63} Three of 5 bite victims were bitten by the family dog or one living in the neighborhood⁹ in a population where strays were responsible only for 13 to 25% of bites.^{39,50} Results of other studies are consistent with these.^{10,34,35,48,64} Family dogs appear to be involved in 25 to 33% of bites.²⁷ Free-ranging owned dogs may be more aggressive than strays when approached and may be more aggressive when they are closer to home.^{57,61} Results of 1 well-conducted study indicated that only for dogs identified as pit bull-type (P < 0.001) were most bites attributable to freely roaming dogs that did not belong to the person bitten.⁴⁶

For 96 dog bites for which data on locale and the relationship of the victim to the dog were available, 52 (54%) involved victims younger than 15 years old, and 82 (85%) occurred in the dog's own home. Twenty-eight of 44 (62%) adults were bitten by their own dog, and 39 of 52 (75%) children were bitten by dogs belonging to neighbors or friends.³⁷ These data strongly indicate that human behavior plays a major role in dog bite injuries.

In 1 study, 85% of dog-bite victims treated in emergency rooms were bitten by their own dog.³¹ Data collected for 1,724 bite injuries indicated that owned dogs delivered more bites, were larger, bit more victims on the head and neck, delivered more bites needing medical treatment, and, in short, were more dangerous than strays.²⁵ This type of data is potentially biased, because it is possible that if the dog is owned by the person bitten, the victim is likely to report only serious bites. This hypothesis is supported by results of 1 study that indicate that bites inflicted by strays (50.3%) are more likely to be examined by a physician than are bites inflicted by family pets (29.1%).⁶⁴ It is important to realize that not all stray dogs are unowned. Many dogs described as strays are actually owned dogs that

are allowed to run free." Regardless, the frequency with which dog bites are reported is disturbingly low. Underreporting and incomplete data are typical even when reports are mandated by law and bite injuries are treated by emergency personnel.³³ Unfortunately, urban emergency departments, which fit the demographic profile for a potentially large number of dog bite-related visits, have the least discretionary time with which to pursue epidemiologic information related to dog bites.

Victims' behaviors and dog bites—Human behaviors factor into dog bites and contribute to the amount of damage done. Children age 5 years or younger are significantly more likely to provoke animals prior to injury than are older children ($P < 0.001$).³⁴

Most dog bites, particularly to children, occur in the summer and on weekends. The diurnal peak in bite incidence is late afternoon and early evening.³⁵ Most children hospitalized for dog bites incur those bites on weekends.³⁶ The temporal environment matters, because children are more likely to come into contact with dogs at certain times. The physical environment also contributes to the likelihood of a bite. More children and dogs are outdoors and active during the periods listed. The greater the number of children and dogs, the greater the potential reactivity of each group. Again, there are no objective measures of this, but empirical evidence from "pack" situations involving dogs and people (an example of the latter would be a mob at a soccer game) indicates that the more excited any participant, the less stable and predictable the situation.³⁷ Such circumstances are ideal for unilateral or joint misinterpretation by the participants of any signaling behavior. Proximity facilitates violence, rather than retreat, as a response in such conflicts.

In the case of canine aggression toward children, there are 2 participants with enough overlap in patterns of sociality that it is possible to misunderstand the extent to which the same signal has 2 different messages and meanings.^{38,39} Just as humans can misinterpret a wagging tail, dogs can misinterpret a screaming child. Children may be uncoordinated and may appear unpredictable to dogs because of their sudden shifts in postures and vocal range when excited. Some behaviors and some intensities of behaviors in young children can frighten dogs. Other behaviors, like shrill squealing, could be misinterpreted by dogs as sounds and signals given by prey. Excitable states facilitate misunderstanding by making all participants less aware of changes in signaling and interactive behaviors. The potential for bilateral misunderstanding and inappropriate reaction with concomitant disastrous circumstances is particularly great for children who may not have the sophistication or maturity to correctly interpret and react in rapidly changing interactions.

One study examining owner demographics revealed that when equal numbers of biting and nonbiting dogs were compared, those without a license, those without current vaccination, those that were not neutered, males, and those that were left chained in the yard bit more frequently than did licensed dogs, those with current vaccinations, those that were neutered,

females, and those that were not left chained, respectively.⁴⁰ Such findings indicate that associations among owner behavior, breed, and dog and human behaviors that owners tolerate or encourage should be more intensively investigated.

Epidemiology of Dog Bites

Location of injuries to humans—Whereas most injuries to adult humans affect the extremities,^{1,2,36} > 70% of injuries to children involve the head, neck, and face.^{1,2,36} Because of their height, children commonly incur bites on the upper extremity, shoulder, head, and neck regions.³⁶ In 1 study, 67% of bites inflicted on children 0 to 4 years old and 56% of bites inflicted on children 5 to 9 years old involved the face and neck.³³ The converse information—the proportion of individuals of each age who are bitten and locations of bites—is not available, because such poor records are kept for dog bite injuries.

Fatalities caused by bites—Although dog bites are epidemic, the per capita death rate attributable to dog bite injuries is relatively low (1 fatal attack/5 million dogs based on a dog population of approximately 50 million).⁴¹ Seventy percent of dog bite-related fatalities occur in children younger than 10 years, whereas 10.2% occur in individuals older than 69 years. The death rate for neonatal humans is 370 times that of adults 30 to 49 years old.⁴² Of 74 deaths attributable to dog bites reported over a 5-year period, 23 were children < 1 year old.⁴³ The 3-year, annualized, adjusted, and weighted estimate of new dog bite-related injury visits to US emergency departments is 333,687 or a rate of 12.9 visits/10,000 people. For each fatality, there were approximately 670 hospitalizations and 16,000 emergency department visits.¹

Pit bull-type dogs, although not necessarily biting more often or being inherently more aggressive than any other breed, are overrepresented in the population of dogs inflicting fatal bites and those causing serious trauma.⁴⁴ Forty-three of 101 (42%) dog bite-related deaths reported between 1979 and 1988 involved dogs identified as pit bull-type. Dogs identified as pit bull-type were involved in 4 of 10 incidents where an infant was pulled from a crib. A high proportion of stray dogs (37%) identified as pit bull-type have been implicated in dog bite-related fatalities.⁴⁵ For no other breed is this scenario true, indicating that when we examine data for pit bull-type dogs, we need to understand their demographics. Unowned free-ranging dogs may be more likely to come from an environment that promotes, enhances, or accepts aggression, whereas owned dogs may have a completely different history.^{46,47} In other words, there may be > 1 population of pit bull-type dogs, and if so, the data from these groups should be analyzed separately.

In 1 study, the breeds most commonly identified in fatal bite incidents were German Shepherd Dogs and German Shepherd Dog crossbreeds; however, dogs of other breeds were responsible for 3 dog bite-related fatalities (2 Rottweilers [same attack], 1 Siberian Husky, and 1 Akita).⁴⁸ Another study found that German Shepherd Dogs were responsible for more fatal

bites than any other breed at a time when the number of registrations with the American Kennel Club (AKC) for German Shepherd Dogs was greater than for any other large breed.³⁶ Regardless, a Spearman rank correlation performed on incidence data for fatal bites comparing breed and number registered by the AKC during a sample year reveals no association between fatal bites and popularity rank ($r_s = 0.066$; $P \geq 0.806$; 15 df). During the same period, pit bull-type dogs were responsible for more deaths than would be expected given their relative rarity at the time of that study.³⁶ Judicious interpretation of these data indicate that fatalities are rare, most dogs involved are members of fairly common large breeds, and that relative representation within AKC registrations is less informative than population-specific breed prevalence data may be. Most dogs inflicting fatal bites are large dogs; fatal bites from small dogs may be associated with a tendency to cuddle them around the face and neck.

Associations between size of dog and injury—An analysis of breed information for 43 dogs involved in 40 attacks on children treated in emergency departments revealed that most dogs involved were members of large breeds.³⁶ These breeds included German Shepherd Dog ($n = 10$), German Shepherd Dog crossbreed (5), Doberman (7), pit bull-type dog (4), and Siberian Husky (3). Single individuals of various other larger breeds (Siberian Husky crossbreed, Labrador Retriever, Akita, Doberman Pinscher, Australian Shepherd, and Chow Chow) were also implicated in these attacks.

Odds ratios from another study that compared dogs involved in bite incidents with dogs not involved in bite incidents indicated that dogs that bit were more likely to be members of common large breeds such as German Shepherd Dogs (odds ratio, 16.4) or Chow Chows (odds ratio, 4.0). Results of that same study also revealed that Chihuahuas, Golden Retrievers, Labrador Retrievers, Poodles, Scottish Terriers, and Shetland Sheepdogs were unlikely to be involved in bite incidents.

Bites from pit bull-type dogs are more often associated with serious injury or fatalities,³⁷ but this may be a consequence of the build and musculature of pit bull-type dogs, rather than a breed characteristic per se. Furthermore, a bite of the same force, administered by the same jaw configuration, could be more injurious when delivered to a victim's head and neck than when delivered to the torso or extremities. Lunging chasing dogs may become airborne and may hit their victims with more force, come in contact with the victim's neck and head more frequently, and potentially inflict more shearing damage than would dogs that bite from ground level.

Sex of dog—If bite incidents for which sex of dog is reported are examined, male dogs bite more frequently than female dogs. However, to completely and correctly interpret such information, it is necessary to know the actual numbers of each sex in the dog population. In 1 British study for which complete information was available, 82 dogs involved in 96 bite incidents were male. Intact dogs, particularly males, are

often involved in dog bites,³⁸ possibly because of their greater tendency to roam within their neighborhoods.⁴⁰

Studies identifying only aggression, rather than a specific diagnosis involving aggression, indicate that intact male dogs are more often implicated in aggression than are castrated ones.^{40,41} Most dogs for which dominance aggression is diagnosed are male.^{40,70} Although dog bite data often do not indicate whether dogs are intact or neutered, data for dominantly aggressive dogs seem to indicate that reproductive status has little effect on whether a dog receives a diagnosis of dominance aggression.^{40,70} Testosterone acts as a behavior modulator that makes dogs react more intensely. When an intact dog decides to react, it reacts more quickly, with greater intensity, and for a longer period of time. If that dog reacts to a strange person or another dog, it will be quicker to bark, growl, or bite and will continue that behavior longer than would a neutered dog.^{40,71} Castration decreases aggression exhibited toward other dogs⁶⁷; however, few data exist regarding its effect on other specific aggressive behaviors.

Age of dog—Little information is available concerning the age of dogs that bite. On the basis of their size, most dogs that bite appear to be adults, but no further conclusions can be drawn. Most dogs receiving a behavioral diagnosis of aggression are entering or are in the midst of social maturity (usually 18 to 24 months at onset; range, 12 to 36 months) when they begin to demonstrate problem behaviors.^{1,72} For most behavioral diagnoses, 1 sex is not more commonly represented than the other; however, the diagnosis of dominance aggression presents a complicated contrast. Most dogs for which dominance aggression is diagnosed are male and becoming socially mature when they first show signs of aggression. When females exhibit dominance aggression, they are significantly younger than males, usually 8 weeks to 11 months old.^{73,74} Puppies can exhibit inappropriate out-of-context aggression, and because of the nature of their appeal to children, they may be more easily provoked by children. Because of complex age-sex associations like this, any conclusions about likelihood to bite and sex or age should be viewed cautiously.

Breeds, perceptions, behavior, and bites—A number of investigators have attempted to find a relationship between breed and dog bites (Table 3). There are 3 methods by which we can estimate the effect of breed on reported bite incidence.⁷⁵ Breed-specific bite rates indicate what percentage of dogs of a specific breed were involved in biting incidents. This requires that we know populations of all biting and nonbiting individuals—data that are rarely available. Relative risk indicates how much more or less likely a specific breed is to be involved in a bite incident, compared with other breeds. Again, this requires a good estimate of populations of all breeds. The population attributable fraction percentage (PAF%) is a measure of a breed's impact on the overall population. The PAF% is often calculated by using license records to estimate breed populations. Numbers obtained from this approach may be quite different from actual breed populations, because in many locales, licensing compliance is low.

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Table 3—Data from dog bite injury studies that contain breed-specific information for at least 3 breeds

Description	3 breeds most often involved ($\geq$ level of significance if available or calculable)	Study reference
1993 breed distribution of dogs quarantined for bites by a Wisconsin humane shelter, compared with total number of dogs belonging to the listed breeds entering the shelter for other reasons	Chow Chow, 13/170; 7.6%; $P < 0.05$; $G_{adj} = 8.49^*$ Cocker Spaniel, 23/316; 7.3%; $P < 0.05$; $G_{adj} = 15.543^*$ Lhasa Apso, 14/203; 6.9%; $P < 0.05$; $G_{adj} = 8.261^*$	58
Incidence rates of dog bites by breed at 2 United States Air Force bases January 1976 through December 1977	Bites/100 animals per year; relative risk compared with mixed breed† Collie, 20/100; 2.9 German Shepherd Dog, 17.4/100; 2.6 Cocker Spaniel, 13.7/100; 2.0	31
Case-controlled study of 178 nonbiting and 178 biting dogs	Biting; nonbiting Chow Chow, 31 (17.4%); 9 (5.1%)† German Shepherd Dog, 34 (19.1%); 13 (7.3%)† Collie, 8 (4.5%); 1 (0.6%)‡	4
Prospective study of dog bite-related injuries seen at the Children's Hospital of Philadelphia in 1989, 156 dogs of identifiable breeds plus those identified as mixed breeds	German Shepherd Dog, 35 (20.8%) Pit bull-type dogs§, 33 (19.6%) Rottweiler, 8 (5.4%)	46
Bites seen in 1975 at University of California, Los Angeles, emergency department and referred for surgery	Mixed breed, 41/135 (31%) German Shepherd Dog, 28/135 (37%) Terrier (unspecified), 5/135 (7%)	23
Survey of 455 families in a Denver pediatric practice comparing breeds of dogs that had bitten with those owned by families in the practice	Biting No. of breed (%); No. owned by families (%) German Shepherd Dog and crosses, 34 (17.5); 21/110 (19%) Mixed breed > 30 lb 24 (12.4); 27 (14.2) Poodle 20 (10.3); 27 (14.2)	47
Retrospective study of breed of dogs involved in 835 bite injuries reported in Norfolk, Va, between Jan 1 and Jun 30, 1971	Mixed breed, 350 (41.5%) German Shepherd Dog, 211 (25%) Poodle, 37 (4.4%)	24
Retrospective study of 16 severe or fatal dog bites in 5 South Carolina counties between Jul 1, 1979, and Jun 30, 1982	American Staffordshire Terrier, 5† Saint Bernard, 3 Cocker Spaniel, 2	48
Retrospective study of breeds of dogs involved in reported bites, compared with frequency of registration of those breeds in Baltimore, Md, between 1974 and 1976	Registered; involved in bites (%) German Shepherd Dog, ** 1974: 2,437; 1,291 (44.2) 1975: 3,759; 1,143 (46.1) 1976: 2,648; 1,031 (44.4) Mixed breed, ** 1974: 2,648; 1,076 (36.9) 1975: 4,222; 706 (30.7) 1976: 2,766; 943 (27.7) Collie, *** 1974: 519; 78 (2.6) 1975: 944; 75 (3.0) 1976: 647; 65 (2.8)	30
Poll conducted for Victim Injury Surveillance Survey (Australia, 1989)	**No. attacks (%); population German Shepherd Dog, 1,300 (33.6); 1,440 Bull Terrier, 519 (13.4); 450 Doberman Pinscher, 310 (8.0); 360	36
Retrospective study of 250 dog bites recorded by Guelph Health Unit between 1986 and 1987	Relative risk; population % American Staffordshire Terrier, 38.81; 0.6 Duck Telling Retriever, 39.81; 0.6 Saint Bernard, 26.72; 1.3	34

*Log-likelihood χ^2 ; our statistics. †All $P < 0.01$, $\ddagger P < 0.001$; Yates corrected χ^2 test. $\S P = 0.04$; Fishers exact test, 2-tailed.
||Pit bull-type dogs were overrepresented in unprovoked bites and those inflicted by roaming dogs; $P < 0.01$ or better; χ^2 test.
¶No further statistical analysis possible. $\# P < 0.05$; χ^2 test; based on distribution of breeds, when known. ** $P < 0.05$; log-likelihood χ^2 ; our statistics; all $G_{adj} > 100$. ***Not significant.

Relative risk = Biting rate of breed (No. licensed biters of breed/total No. licensed X 1000)/biting rate of all other breeds.

an equal probability that any dog will bite, the number of bites reported for that breed should increase. How great this increase is can be affected by apparency of the breed and skewed by media attention given purpose bred dogs (eg, those bred for fighting, protection or other specific behaviors). The problem with media attention and apparency may be worse for dogs identified as pit bull-type. In response to a perceived increase in pit bull-type dog-related injuries, 1 investigator ascertained the dogs' breeds and relationships to victims for 168 bites inflicted on children.⁴⁴ Bite injuries involving dogs of a given breed were: German Shepherd Dog ($n = 35$); pit bull-type dog (33); Rottweiler (9); Doberman Pinscher (7); terriers (individual breeds grouped: 6); Siberian Husky (5); other (10); unknown (2); and mixed breed (61). The numerically dominant breed involved in bites in this study, the mixed breed, is likely to be the numerically dominant breed in the overall dog population.

On the basis of these data, bites from pit bull-type dogs receive disproportionate attention when compared with bites from other breeds. Newspaper accounts from which many data are collected may not be reliable.⁴⁵ Dog license data have been employed to create a more reliable database.⁴⁶ Such data may be important when evaluating the association between owner behavior, breed, and dog behaviors tolerated or encouraged

No single database is available that would provide complete information for any of these methods.

As individual breeds gain popularity, and assuming

by owners. In the United States, American Pit Bull Terrier owners are less likely to license their dogs than are German Shepherd Dog owners.⁴⁶ Biting dogs, in

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general, are also more often unlicensed in case-control studies.⁴

A 1991 case-control study evaluating biting and control (nonbiting) dogs⁵ produced a ranking that indicates an association between popularity of breed and incidence of dog bites in that breed. Biting dogs were more likely to be German Shepherd Dogs ($P < 0.01$) or Chow Chows ($P < 0.001$). Nonbiting dogs were more likely to be Golden Retrievers ($P < 0.01$) or Standard Poodles ($P < 0.03$). None of the biting and only 1 control dog were of the pit bull-type at a time when new ownership of pit bull-type dogs was outlawed, but retention of previously owned dogs was not.⁴ It is impossible to draw breed-based conclusions from this small sample. Without knowing the number of dogs of a given breed within the local pet population, breed-specific comparisons of those that bite (or kill) and those that do not are not possible.

Many behavioral and physical factors that correlate with breed are also associated with injury and potential to injure. Evaluating these factors separately from breed would go a long way toward dispelling myths about canine aggression. Physical factors that may affect the amount of injury that an aggressive dog can inflict include size (mass and height), age (younger dogs are more energetic and less inhibited by physical disability), bone structure (tenacity of purchase [Mastiffs and Rottweilers]), and physique (distribution of muscle mass and relative strength). Rottweilers and Doberman Pinschers, dogs with poor reputations in the popular press, are responsible for a small percentage of injuries requiring plastic surgery, whereas sustained attacks most commonly involve German Shepherd Dogs, Doberman Pinschers, and Staffordshire Bull Terriers.⁷ These associations illustrate the interplay between physical and behavioral factors. Behavioral factors that correlate with degree of injury include age of onset of aggression, duration of aggressive behavior, intensity of aggressive bout, frequency of aggression, and response to correction and other contextual information.⁸ These behavioral factors emphasize the roles of learning and context-appropriate behavior, which are often ignored in behavioral evaluations.

Results of studies available to date indicate that the population sizes of specific breeds and the behaviors of individual dogs should be considered before drawing conclusions about breed propensities.

Canine Behavioral Tendencies and Their Associations with Dog Bites

Normal canine behavior.—Hundreds of years of artificial selection have yielded canine size and shape variations that exceed thousands of years of natural selection effects on wolves.^{7,9} Much of the physical variation in dog breeds is a consequence of overt selection for specific behavioral suites (eg, herding vs retrieving behaviors). Similarly, the manner in which dogs communicate with each other and with people is likely to be influenced by these selected traits. Some dogs' behavioral problems are simply different manifestations of traits that have been selected for by humans.

Dogs share characteristics with humans that make them good working and social companions: they engage in extended and extensive parental care, other family members contribute to the care and social development of offspring, they are socially mature after they are sexually mature, their social systems are based in deference, they have rules governing behaviors so that signaling is often redundant, and most signaling or affirmation of signaling is nonvocal rather than vocal.^{11,12} Unfortunately, these similarities may lead people to underestimate subtleties of canine behavior and to anthropomorphize or anthropocentrize. For example, a dog that wags its tail may or may not be happy; a wagging tail is indicative of a willingness to interact and a stiff tail with a wagging tip is common in confident aggressive dogs.¹³ If the dog has a problem with aggression, staring at or reaching for the dog may be sufficient to trigger further agonistic behavior and frank aggression. Progressive children's books are beginning to indicate such distinctions.¹⁴

In the case of most aggressions and anxieties related to social maturity, the condition manifest by the dog has actually been changing because of changes in the interactive social environment. Most aggressive dogs are clinically behaviorally abnormal; the abnormality is usually progressive and is influenced by the social environment, so the signs noted by the client and clinician have been changing. We can easily understand such progressive changes in infectious and noninfectious disease and so should be able to understand them as conditions that manifest as behavioral illness; yet, regular screening for behavioral propensities is not a common part of routine veterinary examinations.

Selection of selection for breed-associated traits.—Before breed-specific legislation is seriously considered, it is necessary to ask whether such legislation can be substantiated by science. To do this, we must understand how we have actively or passively selected for inappropriate or aggressive behavior. Data previously reviewed indicate that the breed of dog most often involved in dog bites covaries with the popularity of the breed, and that these changes may be relevant for 1 group of children (males between 5 and 9 years old) who appear to have a greater propensity for injury. Behaviors of breeds do not remain constant as breeds become popular, but change in ways that are consistent with population genetics.

A breed may be bred to display a narrow suite of behaviors that are considered acceptable, and individuals outside the bounds of acceptability are culled or not bred. When dog breeds become popular, 2 things happen: first, selection is relaxed, and because there is underlying genetic variance, less favorable traits are expressed; and second, individuals expressing these traits and behaviors are not selected against, rather they are desired, because the dogs are "hot," "tough," "sexy," or "sharp." In this situation, owners tolerate, select for, and enhance inappropriate out-of-context behaviors (Fig 1 and 2).

Breeds may also be bred and selected to look a particular way or to perform a suite of behaviors (eg, guarding, herding), and breeders deliberately move the

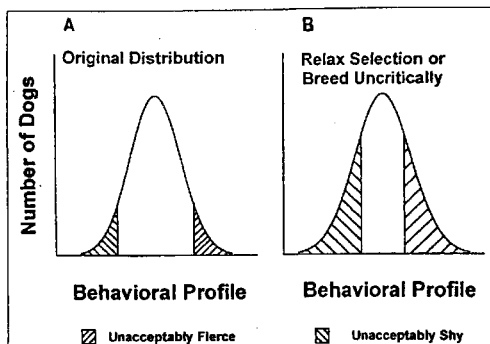


Figure 1—Graph A represents the hypothetical distribution of behavioral phenotypes for a random breed. The individuals under the left hatched area of this curve are considered too shy to perform the task for which the breed was developed or are too shy to be desirous in the pet population. The individuals under the right hatched area of this curve are considered too fierce to perform the task for which the breed was developed or are too fierce to be desirous in the pet population. Selection has limited the spread of the less desirable population members by not breeding them, and in this example breeding of unaffected members maintains the represented distribution. Graph B shows what happens, all other forces being unchanged, if selection is relaxed or breeding is uncritical, and the undesirable members are included or encouraged in the breeding population. The relative proportion of dogs with both undesirable phenotypes of behaviors increases.

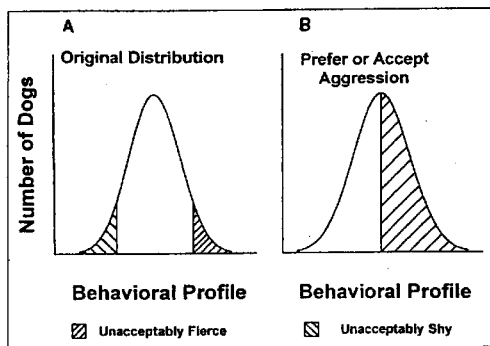


Figure 2—Graph A is the same as graph A in Figure 1 and is originally maintained in the same way. Graph B represents what happens when the unacceptably fierce animals are preferred, and selection acts to reinforce this through preferential breeding and culling of unacceptably shy animals. The relative proportion of the unacceptably fierce phenotype of dog increases.

mean of the population to a slightly more perfect dog. In doing so, they forget that in the absence of selection against undesirable traits, the entire normal distribution shifts, and the proportion of dogs with undesirable traits or ones that behave inappropriately also increases (Fig 3).

Other than these broad population level associations, not much is currently understood about canine

behavioral genetics, even when normal behavior is involved. Studies designed to identify heritable components of breed-specific performance traits have not yielded definitive results. Tracking and scenting ability in German Wirehaired Pointers appear moderately heritable (ie, they have high additive genetic variance) and should respond rapidly to selection.⁸² For more complex behaviors such as sheep herding, the mode of inheritance and the extent to which any behaviors comprising style of approach and instinct are heritable are complicated and arguable.^{82,83}

Investigations of unpredictable aggression have produced no firm results regarding heritability⁸⁴; however, for many breeds in which dominance aggression is common, each generation may contain affected individuals, indicating that inheritance may be of the simple dominant type.⁸⁵ Shyness or lack of exploratory behavior has been investigated in pointers.^{86,87} Whereas these behaviors appear to run in breeding lines, environmental contributions cannot be eliminated. A fearful shy breeding line of mixed-breed dogs, sired by a Siberian Husky, has been produced under conditions designed to minimize environmental influences.⁸⁸ Evidence exists that links temperament and the probability of developing hip dysplasia in German Shepherd Dogs^{89,90}; however, this assessment involved a scoring system for rating temperament that may have obscured individual behaviors.

Role of illness and veterinary intervention—Although not specifically implicated in many reported dog bites, dog owners and veterinarians should be aware that pain, certain endocrine and neurologic conditions,^{91,92} and many sedative, tranquilizing, and anesthetic agents (eg, benzodiazepines, neuroleptics, xylazine) can make dogs more reactive and less predictable.⁹³ Stimuli to which the dog may not have previously reacted (eg, a noise or hug) may induce or facilitate aggression under these influences. Veterinarians should provide anticipatory guidance in these cases.

Behavioral and/or problem canine behavior and its association with dog bites—Aggression is best defined within a particular context as an appropriate or inappropriate threat, challenge, or contest that is ultimately resolved by combat or deference.⁹⁴ This definition is consistent with those for hierarchical terms that focus on the ability to control access to resources.⁹⁵ The question of whether a behavior is contextually appropriate is seldom raised when

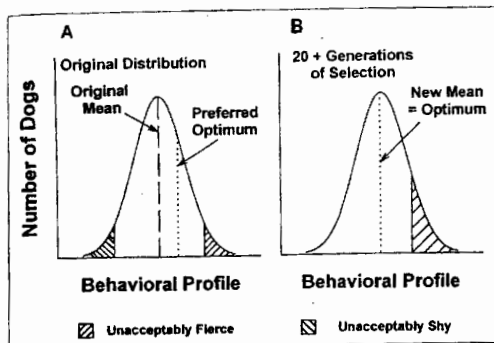


Figure 3—Graph A shows a distribution like that in graph A in Figure 1 and is originally maintained in the same way. In this case, the original mean represents the mean phenotype of the selected behavior in the breeders' populations. The line marked preferred optimum represents the phenotype of the behaviors that breeders prefer and have selected for by breeding only dogs that have phenotypes close to it. Graph B indicates what happens after 20+ generations of breeding for the preferred optimum. In this case, the mean of the behavioral phenotypes in the population has shifted to the preferred optimum, and as a result, the proportion of dogs with the undesirable behavioral phenotype of unacceptably shy has decreased to nil, whereas the proportion of dogs with the undesirable behavioral phenotype of unacceptably fierce has increased, along with an increase in the proportion of dogs with the highly desirable optimum phenotype.

dogs save someone from attack. Conversely, police and guard dogs are useless (and dangerous) if their first recourse in any situation is to bite. These dogs are usually trained to act in a contextually appropriate coordinated manner with their human partners and to inhibit their own inappropriate behaviors. Inappropriate bites from these dogs are the exception rather than the rule.

Provocation must be discussed in the context of a dog known to be aggressive in certain circumstances, compared with a dog that has never reacted aggressively in those same circumstances. If a dog is known to have behaved inappropriately in certain contexts (ie, petting, reaching over its head), it may be unintentionally provoked²⁴ by what would otherwise be considered a normal gesture. For behaviorally abnormal animals, normal gestures may not be perceived as such; this part of the clinical picture can be understood and treated. Available data on dog bites and children indicate that many of these dogs and children are interacting in provocative or inappropriate circumstances, and that misinterpretation of canine behavioral signals may be a problem.

If a dog is provoked, even unintentionally, inappropriate, undesirable, and dangerous behavior is reinforced. Although available data are inadequate to address this issue, it is possible that this is exactly the circumstance under which most dog bites (ie, those to male children, by owned and known dogs) occur. If we persist in blaming breeds, the valid issues of distinguishing between appropriate and inappropriate behaviors and dangerous versus nondangerous breed- or species-typical behaviors will be ignored.

Data from dogs for which a behavioral diagnosis has been made—A comparison between dog breeds seen at the Veterinary Hospital of the University of Pennsylvania (VHUP) Behavior Clinic and breeds seen as part of the general VHUP population revealed only 4 breeds that were overrepresented in the behavior clinic between 1992 and 1996²¹: Chow Chows (log-likelihood ratio χ^2 [G_{adj}], 4.830; $P < 0.05$ [1 dog was responsible for the statistical difference]), American Cocker Spaniels (G_{adj} , 8.739; $P < 0.05$), Dalmatians (G_{adj} , 6.537; $P < 0.05$), and English Springer Spaniels (G_{adj} , 76.315; $P < 0.05$). This distribution may not represent those breeds seen a decade ago. In 1993, the 5 most commonly registered by the AKC were, in order, Labrador Retriever, Rottweiler, German Shepherd Dog, Cocker Spaniel, and Golden Retriever. Careful questioning of clients reveals another factor that has been ignored in discussions of breed prevalence: English Springer Spaniel owners seeking help at the VHUP appear to do so readily, because they know that some lines of English Springer Spaniels bred for conformation in the United States have problems with aggression.^{21,92,c} Purebreds are significantly overrepresented when compared with mixed breeds for dominance aggression only.⁹³

Breeds for which at least 10 individuals received a diagnosis of dominance aggression at the VHUP between 1996 and 1998 included mixed breed ($n = 38$), English Springer Spaniel (18), Cocker Spaniel (18), Labrador Retriever (13), Golden Retriever (12), Dalmatian (12), Rottweiler (19), and German Shepherd Dog (10). Dominance aggression was diagnosed for < 10 dogs of 49 other breeds. The breeds represented by 10 or more individuals include 4 of the 5 most commonly registered AKC breeds in 1993. If patterns of popularity interact with social maturation, clustering for breed associations and problem behaviors should be expected.

Issues of Fact and Myth

An extensive review of the literature concerning dog bite injuries reveals that the only robust data are those supporting the following conclusions: there is a substantially greater injury and fatality rate for children when compared with adults; male children are injured and killed more often than female children, indicating that human behavior may be a major factor; and there is a preponderance of owned family dogs involved in bites and fatalities.

Breeds presently most involved in dog bites include mixed breeds, German Shepherd Dogs, German Shepherd Dog crossbreds, pit bull-type dogs, and pit bull-type crossbreds.^{23,30,36} The latter 4 breeds are most often involved in fatalities.^{30,36} A careful reading of the literature supports 3 conclusions regarding breed:

the breeds most represented in dog bite data vary over time (which may indicate changes in breed preference by owners rather than changes in breed-specific aggressive tendencies per se); breeds most often represented in published data are popular ones, and no 1 breed may be represented in bite data in proportion to its actual population (good data on population sizes of each breed and mixed breeds relative to human victim populations studied are not available but are essential if legitimate statements about breed overrepresentation are to be made); and "pit bull" is often applied, without biological basis, to a range of dog types, regardless of the underlying genetic stock^{36,37} (this problem may be magnified in communities that have experienced a previously publicized pit bull-type dog attack).

There is no question that dog bites are a problem, but even after an extensive review of the data, we know little about the actual behaviors of dogs involved in bites, regardless of breed. If we want to know why dogs bite and minimize morbidity and mortality, the following goals must be met.

First, the prevalence of dog breeds and ages, sex, and reproductive status within these breeds must be known for the population of bites to be investigated. Any discussion of breed-specific aggressive propensities must be critically reviewed. Caution is urged regarding any generalization about inappropriate breed-specific behaviors. Selection for specific behaviors should be viewed as a risk assessment analysis: breeds that have been selected for 1 or a few specific behaviors may be more at risk for developing undesirable variations on those behaviors. This does not mean that breeds for which protective behaviors are selected are more aggressive than breeds for which this selection pressure is absent. Any dog, regardless of breed, can exhibit inappropriate behaviors. It does mean that certain breeds may be more at risk of having a disproportionate number of dogs that exhibit inappropriate out-of-context protective aggression. Furthermore, dogs selectively bred for tenacity and jaw strength (eg, American Pit Bull Terriers, Rottweilers, Rhodesian Ridgebacks) will exhibit these same characteristics when they respond with inappropriate behaviors. Coupling inappropriate behaviors and physical strength (eg, large dogs, heavy musculature) results in infliction of severe damage on a first strike.

Second, canine and human behaviors that limit or increase exposure need to be defined and quantified. Any dog breeder, owner, or veterinarian who accepts displays of inappropriate aggression or who believes that such aggression is normal for their breed (or not dangerous because the dog is small) is contributing to the problem.

Third, it is important to know which dogs bite and whom they bite.³⁸ Behavioral profiles of dogs that do and do not bite and of their owners' behaviors must be developed. These studies will help determine whether dog bites are associated with a behavioral diagnosis of aggression and the extent to which certain human behaviors foster aggression.

Fourth, situations in which bites occur need to be thoroughly, rigorously, and consistently reviewed and documented by healthcare personnel, using validated

assessment tools.³⁹ The appropriateness of the situation, the extent to which a bite is provoked, the nature of the provocation, and the behavioral tendencies of the dog involved (including whether the dog has received a behavioral diagnosis involving aggression) must be evaluated. This aspect is particularly important given the association between dog abuse and child abuse and the extent to which violent behaviors are learned and practiced.^{36,40}

Achieving these goals will require a tremendous amount of work, and anyone who is serious about dogs should have a vested interest in seeing projects that address these issues get funded, accomplished, and published. In the absence of actual numerical demographic data, conclusions and legislation based on breed are being drawn from incomplete and skewed data and are premature.¹⁴⁻¹⁶ Our analysis of the data also suggests that initiatives^{31,36-101} that teach children how to react appropriately in specific situations involving dogs may only be addressing exceptional situations. If this is true, such initiatives may have limited benefit in reducing dog bite-related injuries and fatalities.

*Courtesy of the Insurance Information Institute, New York, 1994.

*Courtesy of State Farm General Insurance Co, Bloomington, Ill, 1995.

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Epidemiology of dog bites: A Belgian experience of canine behaviour and public health concerns

Tiny De Keuster^{a,*}, Jean Lamoureux^b, André Kahn^{b,†}^a Bite Prevention Work Force 2000–2001, University of Brussels, Brussels, Belgium^b Department of Paediatrics and Paediatric Surgery, University Hospital for Children Queen Fabiola, University of Brussels, Belgium

Abstract

This paper reviews three studies that have been conducted in Belgium on dog bites on children. (1) A telephone study revealed that 22/1000 children <15 years of age were victims of dog bites annually. (2) Data on the characteristics of dog bites were collected prospectively over a period of 8.5 months in six hospital emergency departments. "Dangerous dogs" were not responsible for the majority of the accidents. In 67/100, incidents documented, the bites appeared to be triggered by an interaction of the child. Education appeared to be the preventive measure with the highest priority. (3) Among 22 child victims of dog bites, 12 had symptoms of post-traumatic stress disorders some seven months following the accident. Based on these local studies, several initiatives have been undertaken to favour both primary and secondary prevention measures. An appropriate psychological preventive intervention should be offered to all victims of dog bites.

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Keywords: Bite; Child; Dog; Education; Prevention; Post-traumatic stress disorder; PTSD

1. Introduction

Following a series of fatal dog bite accidents involving children and the ensuing public preoccupation about the risk of dangerous dogs, the Belgian Government established a Multidisciplinary Task Force to study the development of a combined medical and veterinary approach towards dog bite prevention. The group was chaired by a behavioural veterinarian and included representatives from hospital emergency services, paediatricians, plastic surgeons, psychiatrists, epidemiologists and veterinarians. One of the main conclusions of the Task Force was the need to collect more data on dog bites in Belgium. A survey was, therefore, initiated by the national paediatricians organisation, the Children's

University Hospital in Brussels and the veterinary profession (Kahn et al., 2003, 2004; Peters et al., 2004).

This paper summarises the results of this survey on prevalence, characteristics and consequences of dog bites on children in Belgium. We conclude with a brief description of initiatives undertaken to encourage a safer relationship between children and dogs.

2. Prevalence of dog bites in children

The prevalence of non-medically attended dog bite incidents in children has not been specifically evaluated. In the literature, dog bite frequencies have been estimated at between 9 and 18 per 1000 subjects (Kahn et al., 2003; Overall and Love, 2001; Sacks et al., 1996). These figures include both adults and children. As children are at least 3–5 times more likely to experience dog bites than adults (Overall and Love, 2001; Sacks et al.,

* Corresponding author. Tel./fax: +32 9 3725008.

E-mail address: tiny.dekeuster@pandora.be (T.D. Keuster).

† Died 2004.

1996), it would be expected that the prevalence of dog bites is significantly greater in children. We considered that such data could be useful to set goals for local prevention programs.

2.1. Methodology

A telephone survey was conducted between August and November 2002 in the French-speaking community of Belgium. From an initial anonymous list, established by the telephone company Belgacom, 8000 home telephone numbers were randomly selected. Families entered the study if they included at least one child <15 years of age and if parents agreed to answer a questionnaire about family characteristics. If a child had been bitten by a dog during the 12 months immediately preceding the enquiry, additional questions were asked about the circumstances of the accident and type of medical intervention. The questionnaire had been pre-tested on 20 families and some questions modified or omitted for lack of clarity. The University of Brussels Ethics committee approved the study.

2.2. Findings

Of the 8000 phone numbers randomly selected, 1184 (14.8%) were included in the study. The other families could not be contacted (16%), did not wish to participate or did not meet the selection criteria.

A dog was owned by 398/1184 families (33.6%). Of the 1184 families, 26 reported that a child had been bitten by a dog during the preceding 12 months. The annual prevalence of dog bite was thus 2.2% (C.I. 1.4–3.0). Among the 26 children bitten by a dog, 10 were presented to a general practitioner; five to a hospital emergency department; and one child was hospitalised. No child had been bitten on a second occasion during the preceding 12 months and no child had died following a bite accident.

2.3. Interpretation of the findings

An annual frequency of 22 bites per 1000 children under the age of 15 years was determined. The findings support a previous observation that far less than 50% of dog bites were reported to medical or legal authorities (Overall and Love, 2001). The actual incidence of dog bites could still be greater than reported in this survey. It is possible that the incidence could have been underestimated for a variety of reasons. For example, younger families, with access to only mobile phones, might not have been reached, while bites from family pets could have been under reported (Overall and Love, 2001).

According to the results found in this survey, the National Health Care register for Care Reimbursements

(UNMS) calculated a conservative estimation of €610,000 for yearly medical care cost for children victims of dog bites. However, the evaluation of the costs related to the medical care have been underestimated, as the cost of drugs, specialist or surgical intervention, as well as follow-up visits were not included in our conservative model. Neither did the model take into account indirect costs, such as analgesic treatment or lost schooling and work, either by the victim or parents. The average payment for a dog bite-related injury might, therefore, be much higher.

From this study, it can be concluded that dog bites represent a significant and under reported part of accidents in children.

3. The characteristics of dog bites in children

To evaluate a strategy for the prevention of dog bite accidents to children, data were collected on the characteristics of the accidents, with a description of both the dog and the human victim.

3.1. Methodology

A prospective study was conducted in six hospital emergency departments (three urban university teaching hospitals and three rural hospitals) between April 15 and December 31, 2001. Paediatricians prospectively collected standardised information on all child victims of dog bites brought in for treatment to a hospital emergency department. The children were included in the study if they were younger than 16 years old, had been bitten by a dog <72 h earlier, and agreed to answer a questionnaire either themselves or to have an adult care-giver do so. The questionnaire contained 23 items related to the characteristics of the victim and the dog, the circumstances of the accident, and possible follow-up. The questionnaires were pre-tested on 10 subjects not included in this study, and after some modifications, the final version of the questionnaire was explained to the teams of the participating emergency departments. The questionnaires were administered by a physician or a nurse in the emergency ward.

3.2. Findings

During the 8.5 months of the study, 120 questionnaires were collected. Ten questionnaires were rejected as incomplete, and 10 other questionnaires were excluded from the analysis because the children were older than 16 years, or the bite had occurred >72 h earlier. The files excluded from the study concerned 14 children bitten whilst at home and six children bitten whilst in a public place. The final analysis was limited to the first 100 completed and interpretable questionnaires.

On average, three child victims of dog bites were brought each month to the emergency departments of the teaching hospitals. During the same period, and in the same emergency wards, a mean of 11.5 infants were brought in each month following road traffic accidents and 10 following burns from fire (Kahn et al., 2003). The frequency of dog bites was, therefore, equivalent to about a quarter of all road traffic casualties and a third of burns at home. Dog bites were responsible for 0.24% of all the children who were brought to the emergency departments.

Of the 100 victims included in the study, 65 were bitten whilst at home, and 35 whilst in a public place. Of 65 children who were bitten at home, 61 (94%) were familiar with the dog that bit them. Only 10/35 children who were bitten in a public place were familiar with the dog that bit them (29%). The frequency of bite incidents that appeared to be triggered by an interaction of the child was 56/65 accidents at home and 11/35 in public places. The bite incidents that occurred at home involved children of around four years of age, who were without adult supervision at the time of the bite. At home, most bite incidents seemed to be associated with an interrelationship between the child's and the dog's behaviours. The children who were victims of dog bites in public places were around nine years of age. In two cases, the bites appeared to be linked to acts of abuse or negligence, where the owner deliberately ordered the dog to attack and where the victim was abandoned without assistance.

In this survey, the dogs most frequently responsible for the bites were: German Shepherds (28 times), Rottweilers (11) and Labradors (9). Multiple bites were more frequently caused by German Shepherds (15/25 multiple bites) and Rottweilers (5 times). According to the national Dog Registry, the following breeds of dogs were registered in the areas and at the time of the study: Labradors 510, German Shepherds 392, Rottweilers 371.

Comparing the number of registrations of each breed to the frequency of the bites, a significantly greater frequency of bites was found for German Shepherds, with this breed making up 29.3% of the population but accounting for 51.9% of the bites (χ^2 : 11.485, $P < 0.001$). The frequency of bites was approximately proportionate to the number of registered dogs for the Rottweiler breed (27.7% of the dogs for 20.4% of the bites). For Labradors, the frequency of the bites was significantly smaller in proportion to the number of registered dogs (38.1% of the dogs for 16.7% of the bites; χ^2 : 9.316; $P = 0.002$).

Medical advice was sought within a few hours following 93% of the bites. The longest delay was 48 h for a child with an infected wound that had been received at home. Medical follow-up was carried out for 84% of the victims. Two children were treated by a psychologist: one child bitten on the face at home, the other bitten on the leg in a public place and left alone without care.

3.3. Interpretation of the findings

The findings of this survey indicate that the majority of dog bites in children occur during everyday activities in the home environment with a dog familiar to the child. These findings are in agreement with several aspects of dog bites previously reported in France (Kern, 1999), the Netherlands (Van Der Wijk and Klasen, 1981), Canada (Schirpt, 2001), the United States (Overall and Love, 2001; Weiss et al., 1998), and Australia (Ozanne-Smith et al., 2001). These data suggest that governmental interventions at public security level will only partially reduce the number of dog bite in children.

In various countries, several breeds of dogs have been outlawed by "dangerous" dog laws (AVMA, 2001). The efficiency of radical laws prohibiting ownership of animals on the basis of breed remains to be evaluated. This study indicates that "dangerous dogs" such as Rottweilers or Pit Bulls were not the most frequent contributors to the accidents. Therefore, singling out one or two breeds for control might result in a false sense of accomplishment and ignores the true scope of the problem. Judging and outlawing particular breeds as 'dangerous' will not result in a responsible approach to protecting community's citizens (AVMA, 2001). Alternative solutions, such as the application of legislation for the protection of public safety, bite reporting and restraining measures still remain to be evaluated (Overall and Love, 2001).

Notwithstanding the influence of dog behaviour, most bites appeared to be attributable to human misunderstanding of the animal's behaviour. To reduce the frequency of dog bites, both at home and in public places, education therefore appears to be the preventive measure that has the highest priority. Out of 100 accidents, 67 children might not have been bitten, had they and their parents been adequately educated on safe conduct towards dogs. Paediatricians and veterinarians should actively contribute to educate both children and families. Veterinarians have an additional key role in counselling on physical and mental well being of the animal.

It can also be concluded that medical assistance to the children should take into account the psychological effects of the aggression by the dog. Little is known, however, about the potential long-term effects of a dog bite accident.

4. The psychological consequences of dog bites on children

Child victims of dog bites often require medical attention, but psychological support is rarely offered (Overall and Love, 2001; Kahn et al., 2003). As post-traumatic stress disorder (PTSD) may develop following a stressful event (Anon., 2000; Terr, 1991), a study was conducted to evaluate whether following a dog attack children develop a post-traumatic stress disorder.

4.1. Methodology

Between April 2001 and February 2002, 26 child victims of dog bites were presented at the Emergency Department of the University Children's Hospital. Twenty-two children met the inclusion criteria and were included in the study: they were younger than 16 years, had received a minor surgical treatment less than 48 h after a dog bite, and their parents agreed to answer a questionnaire some 2–9 months after the bite.

The questionnaires included 60 items about the child's gender and age, the circumstances of the accident, type of injury, type of dog involved, and the child's behaviour before and following the accident. Semi structured comprehensive interviews were conducted by telephone and eight questionnaires were further completed during a home visit, following the suggestion of the parents. PTSD was defined according to the six major criteria described under the 309.81 diagnostic definition of DSM-IV (Anon., 2000). The number of items met for each criterion was computed and the children were scored according to whether they met all criteria for PTSD (Complete PTSD), had some symptoms of PTSD (Partial PTSD) or had no symptom of PTSD.

4.2. Findings

The children had a median age of 7.5 years (range values: 1–14 years). Twelve of the children were male. For 14 children, the bite occurred at home and nine were bitten on the face. No child was hospitalised following a bite. The median delay between the accident and the interview was seven months (range values: 2–9 months).

Among the 22 children, 12 had shown symptoms of PTSD for more than one month: five had all DSM-IV criteria for PTSD, and seven children had some but not all criteria. PTSD symptoms included vivid recollection and re-living of the traumatic event (12 children), avoidance behaviours or numbing (seven children) and/or signs of increased arousal (six children). Remembrance/re-living of the event was demonstrated by frequent questioning about dogs and/or intense fear reactions in the presence of a dog. Two children repeatedly played games, acting as aggressive dogs. Avoidance behaviours were seen in the form of children's refusal to go out unaccompanied to a park, a street or at school. Three children had become shy and aggressive with siblings and peers. Psychological numbing was manifested by a lack of interest in games and in school activities. Hypervigilance occurred in the form of fear of potential accidents, and fear of the dark, anxiety when left alone, difficulty going to bed and falling asleep, frequent nightmares, agitated sleep and night-time arousals.

No difference was found between the 12 children with a complete or partial PTSD and the 10 children with no PTSD symptom for age, gender, time since the bite, type

of dog, place of the accident, owner of the dog, child's activity at the time of the accident, or part of the child's body bitten. Six of the 12 children with PTSD, but none of the 10 children with no PTSD symptoms had suffered multiple and deep wounds from dog bites. The children who had suffered a minor bite by their pet had only one or no PTSD criteria.

4.3. Interpretation of the findings

Of the 22 children victims of dog bites, 12 developed either partial (seven children) or complete (five children) PTSD. The reason why PTSD developed in some children only is not known. It could be related to the intensity and aggressive character of the dog attack (Anon., 2000). Only the children who suffered severe and/or multiple bites developed full PTSD symptoms. None of the children who experienced a minor bite from their own pet developed these signs.

This survey leads to the conclusion that children victims of dog bites should be considered at risk of developing PTSD and therefore need appropriate early psychological support. A prompt intervention is recommended to prevent PTSD (Silva et al., 2000). Children who suffered severe and/or multiple dog bites appeared to form a particularly important target for preventive intervention.

5. Local prevention programmes based on the studies

In order to favour the development of primary measures and to prevent the bites from occurring, several private initiatives have been undertaken in Belgium. These types of initiatives may be applicable to the same concerns in other countries.

A Multidisciplinary Contact Group has been in place since 2002. Coordinated by a veterinarian, the group is formed of specialists from various human and animal health disciplines, such as behavioural veterinarians, human psychiatrists, intensive care specialists, plastic surgeons and paediatricians. The group intends to collect data on the occurrence of dog bites throughout Belgium. It informs decision makers, such as departments of government, in order to guide the provision of essential preventive measures.

Educational programs, also based on private initiatives of a multidisciplinary team, have been conducted in school and children's museum settings. An interactive computer animation and picture books have been designed and will be edited to contribute to educate both the children and their families on basic safety rules in relation to dog behaviour. The establishment of secondary prevention measures, to prevent recurrence of the bites, includes the organisation of scientific exchanges between human and animal health care providers.

6. Conclusions

These studies – focusing on three different aspects of concerns pertaining to dog bites in Belgium – have led to three main conclusions. First, that dog bites directed at children represent a significant public health issue. With its prevalence of 22 incidents per 1000 children <15 years of age each year, the incidence of dog bites lies between that of domestic accidents and road-traffic accidents involving children. Dog bites represent a significant part of avoidable accidents in children.

Second, children who have suffered from severe and/or multiple dog bites should be considered at risk of developing post-traumatic stress disorder. Some children may be particularly vulnerable to this outcome, irrespective of the apparent severity of an attack. A psychological preventive intervention should be offered to all victims of dog bites, within a systematic medical assistance programme.

Finally, the characteristics of the bite incidents reveal that, both at home and in public places, education should be the preventive measure with the highest priority. Contrary to public opinion, “dangerous breeds”, such as Rottweilers or ‘Pit Bull Terriers’, were not the most frequent contributors to bite incidents. That one popular breed, the German shepherd, was over-represented in the biting dog group compared with its registry numbers in Belgium, suggests certain aspects of what makes a dog popular or desirable and may need to be further examined in the interests of the breed and public health. The conclusion of these data support the importance to inform governments that statistics on fatalities and injuries caused by dogs cannot be responsibly used to document the “dangerousness of a particular breed”, relative to other breeds’ (Overall and Love, 2001; AVMA, 2001).

Accordingly, we conclude that the development of primary and secondary prevention measures can be seen as an important goal in the issue of dog bites. In order to achieve that goal, we would like to stress the need for multidisciplinary research in the field of preventive educational tools, with regard to the way children and dogs relate to each other in different life stages (Love and Overall, 2001), as well as with regard to the results achieved in terms of reduction of bites. The development of educational dog bite prevention programs would benefit to be coordinated, funded, and conducted with the participation of all those involved in the well-being and education of both the child and the animal. In that way, the collaboration between human and animal health care practitioners might represent an important contribution in reducing the frequency of dog-bite attacks against children.

Finally, it would be extremely valuable to have comparable data from other countries, especially those in the EU which share an increasing number of legislative ini-

tiatives. Few good data on dog bites exist. This paper demonstrates how three separate sets of equally important data can be integrated to paint a fuller picture of an issue that has direct bearing on the veterinary profession. Our findings also suggest that comparable data could be obtained from other countries, creating a European data bank, the collection and true scientific evaluation of such data, as reviewed here, should be of interest to anyone who values dogs and to all those involved in all aspects of public health and education for children.

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CLINICAL AND LABORATORY
OBSERVATIONS

POSTTRAUMATIC STRESS DISORDER AFTER DOG BITES IN CHILDREN

VINCENT PETERS, MD, MARTINE SOTTIAUX, MD, JOCELYNE APPELBOOM, MD, AND ANDRE KAHN, MD, PhD

Of 22 children who were victims of dog bite, 12 had symptoms of posttraumatic stress disorder 2 to 9 months after the bite. Violent dog attacks inflicting multiple and/or deep wounds were associated with risk of posttraumatic stress disorder. (*J Pediatr* 2004;144:121-2)

Children who are victims of dog bites often require medical attention, but psychological support is rarely offered.¹⁻³ As posttraumatic stress disorder (PTSD) may develop after a stressful event,³⁻⁶ a study was conducted to evaluate whether PTSD develops in children after a dog attack.

METHODS

Between April 2001 and February 2002, children who were victims of dog bites were consecutively enrolled at the Emergency Department of the University Children's Hospital. Inclusion criteria included children younger than 16 years who had received a minor surgical treatment less than 48 hours after a dog bite and whose parents agreed to answer a questionnaire 2 to 9 months after the bite.

The questionnaires included 60 items about the child's sex and age, the circumstances of the accident, type of injury, type of dog involved, and the child's behavior before and after the accident. Semistructured comprehensive interviews were conducted by telephone and 8 questionnaires were further completed during a home visit, following the suggestion of the parents.

PTSD was defined according to the 6 major criteria described under the 309.81 diagnostic definition of DSM-IV.⁴ The number of items met for each criterion was computed and children were scored according to whether they met all criteria for PTSD (complete PTSD), had some symptoms of PTSD (partial PTSD), or had no symptom of PTSD.⁷

Statistical analyses were based on nonparametric tests (Wilcoxon rank test, Mann-Whitney *U* test) and χ^2 tests with Yates correction for small series. The statistical significance threshold was $P < .05$. The aim and the methodology of the study were approved by the university ethics committee and were explained to the parents, who gave their informed consent.

RESULTS

Twenty-two of 26 children met inclusion criteria. The children had a median age of 7.5 years (range, 1-14 years); 12 were boys. For 14 children, the bite occurred at home; 9 were bitten in the face. No child was hospitalized after the bite. The median delay between the accident and the interview was 7 months (range, 2-9 months).

Among the 22 children, 12 had symptoms of PTSD for more than 1 month: 5 had all DSM-IV criteria for PTSD; 7 children had some but not all criteria. PTSD symptoms included vivid reviviscence of the traumatic event (12 children), avoidance behavior or numbing (7 children), and/or signs of increased arousal (6 children). Reviviscence included frequent questioning about dogs and/or intense fear reactions in the presence of a dog. Two children repeatedly played games, acting as aggressive dogs. Avoidance behavior was seen in the form of the child's refusal to go out unaccompanied to a park, a street, or school. Three children had become shy and aggressive with siblings and peers. Psychological numbing was manifest by a lack of interest in games and in school activities. Hypervigilance manifestations occurred in the form of fear of potential accidents and fear of the dark,

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From: University Children's Hospital
Queen Fabiola, Brussels, Belgium

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Reprint requests: A. Kahn, Hôpital
Universitaire des Enfants Reine Fabiola,
av. J. Crocq 15, B-1020 Brussels,
Belgium. E-mail: akahn@ulb.sc.be.

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PTSD Posttraumatic stress disorder

anxiety when left alone, difficulty going to bed and falling asleep, frequent nightmares, agitated sleep, and nighttime arousal.

No difference was found between the 12 children with a complete or partial PTSD and the 10 children with no PTSD symptom for age, sex, time since the bite, type of dog, place of the accident, owner of the dog, child's activity at the time of the accident, or part of the child's body bitten.

Six of the 12 children with PTSD but none of the 10 children with no PTSD symptoms had multiple and deep wounds from violent dog bites. The children who had a minor accidental bite by their pet had only one or no PTSD criteria.

DISCUSSION

Of the 22 child victims of dog bites, 12 had either partial (7 children) or complete (5 children) PTSD, but none received psychological support.

Some limitations must be considered in this survey. First, some differences could not have reached significance because of the limited number of subjects. This could contribute to the lack of differences between the children who did or did not have PTSD or the lack of sex susceptibility to PTSD.⁶⁻⁸ Second, in the absence of direct input from the children, it cannot be excluded that parents underreported their children's changes in behavior.^{5,7} Third, the frequency of PTSD could be undervalued because no validated questionnaires for PTSD were used in the study.⁹ The frequency and types of PTSD symptoms were, however, comparable to those reported in other surveys in children.^{4,6,7} Fourth, we have no information on factors known to favor the development of PTSD, such as children's intellectual or personality variables,⁸ past experience,⁶ parents' responses,¹⁰ family history, presence of a parent with PTSD symptoms,^{3,5,6,8} or social support.⁸

The reason why PTSD developed in some children only is not known. It could be related to the intensity and aggressive

character of the dog attack.³ Only the children who had severe and/or multiple bites had full PTSD symptoms; none of the children with an accidental bite from their pet did so.

Despite these limitations, this survey leads to the conclusion that child victims of dog bites should be considered at risk for development of PTSD and need early psychological support. A prompt intervention is recommended to prevent PTSD.³ Children who had violent and/or multiple dog bites appeared to form a particularly important target for preventive intervention.

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SEQUELLES DES TRAUMATISMES PSYCHIQUES CHEZ L'ENFANT : A PROPOS DE L'ETAT DE STRESS POSTTRAUMATIQUE

F. DUCROCQ, S. MOLEND, P. GOLDSTEIN

Auteur principal :

Dr François DUCROCQ
CUMP - SAMU 59
CHRU de Lille
59037 LILLE cedex
Tel : 03 20 44 41 17
Fax : 03 20 44 49 15
E-mail : f-ducrocq@chru-lille.fr

Auteurs associés :

S. MOLEND, P. GOLDSTEIN
Même adresse

RESUME :

Les conséquences psychiques des traumatismes n'ont été systématiquement étudiées que depuis très récemment chez l'**enfant**. Exposé à un événement catastrophique, l'**enfant** développerait cependant des symptômes regroupables en une entité clinique jusqu'ici réservée à l'adulte : le Syndrome de **Stress Post-Traumatique**.

Il s'agit d'une catégorie de troubles anxieux dont l'originalité réside dans son étiologie spécifique et habituellement repérable, marquée par une symptomatologie quasi pathognomonique se développant avec une latence variable après un événement hors du commun. Le noyau symptomatique est représenté par le syndrome de remémoration, l'évitement persistant des stimuli associés au traumatisme, l'émoussement de la réactivité générale ainsi que l'hyperactivité neurovégétative.

Un comportement désorganisé, des éléments dissociatifs, la présence de rêves effrayants sans contenu identifiable, des reconstitutions précises du traumatisme ainsi que des jeux répétitifs à thèmes traumatiques semblent spécifiques à l'**enfant**.

L'absence d'amnésie de l'événement, l'absence d'inhibition de la pensée et de repli sur soi ainsi que la rareté des flash-backs seraient des arguments en faveur du faible retentissement de la pathologie sur les performances scolaires et les apprentissages.

Un survol de la littérature de ces dix dernières années permet en outre de relever plusieurs points :

D'une part, en terme de comorbidité, un diagnostic de PTSD avant 18 ans augmenterait significativement le risque d'occurrence d'autres troubles psychiques.

D'autre part, il est permis de repérer différents facteurs influençant la réponse au traumatisme. Il s'agit des caractéristiques de l'événement et du degré d'exposition à celui-ci, mais surtout de facteurs individuels tels que l'âge, le sexe, le niveau de développement psychoaffectif et les antécédents personnels. Les facteurs sociaux et familiaux sont également abordés.

Enfin, la prise en charge de ce trouble, comme celle des autres syndromes séquellaires, doit associer plusieurs approches et modalités combinées dont la précocité de la mise en route est maintenant reconnue, dérivant par ailleurs d'avantage de l'expérience clinique que de travaux de recherche reposant sur des évaluations et des outils standardisés.

SEQUELLES DES TRAUMATISMES PSYCHIQUES CHEZ L'ENFANT : A PROPOS DE L'ETAT DE STRESS POSTTRAUMATIQUE

Les effets d'un traumatisme chez l'**enfant** n'ont été systématiquement étudiés que depuis très récemment. La majorité des recherches concernant le psychotraumatisme, datant des années 1980, se sont en effet centrées sur l'étiologie, la prévalence et le traitement du PTSD chez l'adulte.

Cependant, des études récentes sur des réactions de l'**enfant** à un événement traumatique suggèrent que l'**enfant** qui a été exposé à un traumatisme développerait des symptômes que l'on peut regrouper sous le vocable de syndrome de **stress post traumatique**.

HISTORIQUE

La connaissance des syndromes de **stress post traumatique** n'est pas récente, puisque antérieure même au développement de la psychiatrie de catastrophe.

Le terme synonyme de névrose traumatique a en effet été introduit à la fin du XIX^{ème} siècle lors des premières descriptions de troubles présentés par les victimes des premiers accidents de chemin de fer. Avec la modernisation de la société sont ensuite apparues des catastrophes industrielles qui se sont ajoutées aux catastrophes naturelles, les guerres, la fréquence des actes terroristes, ainsi que les accidents de circulation au point de donner au traumatisme psychique un véritable statut d'événements de la vie civile moderne.

NOSOGRAPHIE

Cette catégorie de troubles anxieux, dont l'originalité réside dans son étiologie spécifique et habituellement repérable est marquée par une symptomatologie quasi pathognomonique aussi bien chez l'adulte que chez l'**enfant**. Dans les nosographies les plus récentes à savoir le DSM IV, l'état de **stress post traumatique** est défini de la manière suivante :

- **Critère A** : le sujet a été exposé à un événement traumatique : présence d'un événement menaçant - peur intense et sentiment d'horreur.
- **Critère B** : l'événement traumatique est constamment revécu : souvenirs répétitifs provoquant un sentiment de détresse - rêves répétitifs - flash-back - détresse et réactivité physiologique lors de l'exposition à des indices évoquant l'événement.

- • **Critère C** : évitement persistant des stimuli associés au traumatisme ainsi qu'émoussement de la réactivité générale : évitement de situations, de pensées, de conversations ou de lieux éveillant un souvenir du traumatisme - réduction d'intérêt pour les activités importantes - détachement d'autrui - restriction des affects - sentiment d'avenir bouché.
- • **Critère D** : présence de symptômes persistant traduisant une activation neurovégétative ne préexistant pas au traumatisme : difficultés d'endormissement - irritabilité - difficultés de concentration - hypervigilance - réactions de sursaut exagérées.
- • **Critère E** : la perturbation dure plus d'un mois.
- • **Critère F** : la perturbation entraîne une souffrance cliniquement significative ou une altération du fonctionnement social, professionnel ou dans d'autres domaines importants.

Quelques petites particularités s'appliquent sur le plan nosographique plus spécifiquement à l'**enfant**.

Pour le critère A, il est noté que chez les enfants, un comportement désorganisé ou agité peut se substituer aux manifestations de peur intense, de sentiments d'impuissance ou d'horreur retrouvés chez l'adulte.

En ce qui concerne le critère B, représenté par la reviviscence de l'événement traumatique, il est fréquemment relevé chez les enfants la présence de rêves effrayants sans contenu reconnaissable.

Enfin, chez de jeunes enfants, des reconstitutions tout à fait spécifiques et précises du traumatisme sont fréquemment rencontrées.

VARIETES CLINIQUES CHEZ L'ENFANT

Tous les enfants ne développent pas un syndrome de **stress post traumatique** lorsqu'ils sont exposés à un événement à valeur potentiellement traumatique. En effet, l'évolution heureusement la plus fréquente est représentée par de discrets troubles du comportement ou une détresse psychologique mineure.

En outre, certains d'entre eux ne développent qu'un PTSD subclinique au sens du DSM-IV, tous les critères n'étant en effet pas réunis.

Pour distinguer le type d'événement stressant et les différences sémiologiques et pronostiques, TERR distingue le traumatisme de type I et le traumatisme de type II.

TRAUMATISME DE TYPE I :

C'est le cas le plus facilement repéré. Il s'agit du PTSD sous sa forme classique, du moins fréquemment décrite chez l'adulte, d'**enfant** exposés à un seul événement

traumatisant, citons les catastrophes naturelles, les guerres, les bombardements ou les enlèvements, séquestration ou prises d'otages.

1. 1. reviviscence :

La reviviscence de l'événement se traduit par des jeux infiniment répétés exprimant des aspects ou des thèmes du traumatisme. Sous le terme de remise en acte on rapporte des répétitions presque exactes d'attitudes adoptées au moment du choc.

Chez des grands enfants et à l'adolescence les souvenirs sont très souvent visualisés sous forme de flash-back, d'illusions ou d'hallucinations.

Les rêves répétitifs prennent quant à eux des formes déguisées, sous forme de cauchemars à thèmes non spécifiques.

2. 2. évitement persistant des stimuli associés au traumatisme

L'évitement persistant des stimuli associés au traumatisme s'exprime de façon un peu différente dans l'enfance. Contrairement à l'adulte, chez qui on retrouve souvent une amnésie psychogène, de nombreux enfants arrivent à rapporter des récits particulièrement clairs et détaillés de l'événement. D'autres enfants témoignent en revanche de véritables distorsion de la chronologie des faits relatés.

Comme le souligne MOUREN SIMEONI, une autre variété de réévaluation cognitive est représentée par la croyance aux présages. Il s'agit là d'une tentative de la part des enfants de retrouver un contrôle rétrospectif de la situation inattendue. A posteriori, le jeune sujet repense à un détail banal survenu juste avant l'événement, détail auquel il attribue une valeur de mauvaise augure.

3. 3. hyperactivité neurovégétative :

Les symptômes d'hyperactivité neurovégétative ne diffèrent guère de ceux de l'adulte : troubles du sommeil, irritabilité, troubles du contrôle des impulsions, difficultés de concentration, attitudes d'hypervigilance avec sursauts et anticipation anxieuse.

TRAUMATISME DE TYPE II :

Le traumatisme de type II fait suite à une exposition chronique à des traumatismes extrêmes, bien souvent des sévices physiques ou sexuels. Pour certains auteurs, le syndrome de **stress post traumatique** concernerait ainsi 20 à 50 % des enfants victimes de ce type de sévices.

Sur le plan clinique, les signes cardinaux du syndrome de **stress post traumatique** lui-même semblent assez peu varier en fonction du traumatisme. Tout au plus, d'après DEBLINGER en 1989, les signes dissociatifs et d'évitement, dont la régression, prédominerait chez les victimes d'abus sexuels.

FACTEURS DE VULNERABILITE ET DE PROTECTION

De nombreux auteurs se sont également attachés à définir des facteurs de vulnérabilité et de protection.

En ce qui concerne l'âge, il ne semble pas y avoir d'âge, si jeune soit-il, qui protège des effets du traumatisme. Certains auteurs concluent à une moindre vulnérabilité (GREEN et BLOCH en 1966, GLESER 1981) d'autres à une plus grande vulnérabilité (LONIGAN) des enfants plus jeunes. Enfin, d'autres auteurs ne relèvent pas de différences significative.

VULNERABILITE INDIVIDUELLE

Chez l'**enfant** il semble actuellement qu'il y ait peu de données allant dans le sens d'une prédisposition de traits anxieux.

FACTEURS FAVORISANTS

Ce sont les caractéristiques du traumatisme lui-même qui semblent peser plus lourd que les facteurs individuels.

La menace vitale semble déterminante.

Les émotions négatives éprouvées par l'**enfant** durant l'événement traumatique semblent correspondre en partie à la probabilité qu'il perçoit d'être tué ou blessé.

On retrouve également le caractère soudain et inattendu du traumatisme. En effet le sentiment d'invulnérabilité ou de sécurité antérieur aggraverait le contraste, la rupture entre l'instant traumatique et un environnement jusque là stable et sécurisant.

La violence d'origine humaine serait également plus traumatisante que les catastrophes naturelles.

Le degré d'exposition à événement a été particulièrement étudié chez des adultes victimes de catastrophes. La proximité géographique par rapport à l'épicentre du sinistre aurait des conséquences objectivables sur le développement du PTSD. PYNOOS en 1987 relevant une corrélation directe entre la proximité du lieu d'une fusillade et le nombre et la sévérité des symptômes de PTSD chez les enfants d'une école attaquée par un tireur isolé.

EVOLUTION

Selon le DSM III-R les symptômes se manifestent immédiatement ou peu de temps après le traumatisme. Ils débutent parfois à l'issue d'une période de latence qui peut aller de plusieurs mois à plusieurs années.

Cette latence est parfois absente et en tous cas souvent incomplète chez l'enfant, marquée par des troubles assez aspécifiques : troubles du sommeil, irritabilité et retrait social.

Par rapport à l'évolution, et comme le souligne Mc LEER, l'histoire naturelle du PTSD est encore très peu connue, on ne sait en effet pas combien parmi les enfants qui présentent un PTSD après un traumatisme se remettront spontanément et combien passeront à la chronicité.

Signalons par ailleurs que même dans ces cas les performances scolaires de ces sujets demeureraient paradoxalement stables.

APPROCHE THERAPEUTIQUE

Même s'il paraît clair que le traitement type doit associer plusieurs approches et modalités combinées, nous ne disposons actuellement pas d'études se rapportant spécifiquement aux PTSD chez l'enfant.

CHIMIOTHERAPIE

Sur le plan chimiothérapique, plusieurs familles chimiques ont été employées sans que se dégagent actuellement une spécificité de chacune d'entre elles sur les symptômes.

Si DAVIDSON propose l'emploi des antidépresseurs tricycliques en première intention, d'autres auteurs ont préconisé tour à tour les IMAO, les ISRS, les benzodiazépines, la carbamazépine, le lithium, voire même la clonidine ou les bêtabloquants.

On s'interroge encore sur la durée optimale du traitement, sur les effets comparatifs et interactionnels de la chimiothérapie et des psychothérapies, ainsi que sur l'influence de la comorbidité et la précocité de la prescription.

PSYCHOTHERAPIES

Au niveau psychothérapeutique, sans aborder le caractère efficace pour les uns pathogène pour les autres du debriefing, le traitement inclue toujours le principe de l'abréaction du traumatisme.

C'est cette mise en récit, cette verbalisation des faits et des affects associés qui sont utilisés depuis de nombreuses années.

Signalons qu'outre atlantique, on assiste à un regain d'intérêt pour l'hypnose.

Ont également été proposés avec, semble-t-il, une certaine efficacité des approches cognitivo-comportementales assez spécifiques associant notamment relaxation, exposition et retraitement des émotions. Il s'agirait ainsi pour les comportementalistes,

en confrontant l'**enfant** aux stimuli anxiogènes, de donner la possibilité à ces enfants d'atténuer leur réaction d'anxiété, de remobiliser l'expérience émotionnelle du traumatisme ainsi que d'apprendre de nouvelles réponses, de nouveaux moyens de faire face ou stratégies d'adaptation au **stress**.

CONCLUSION

En conclusion, le syndrome de **stress post traumatique**, bien qu'il reste mal étudié chez l'**enfant** pourtant soumis aux mêmes expériences traumatiques que les adultes, est largement sous estimé dans son retentissement sur le développement de l'**enfant**.

L'authentification de son existence, à la lecture d'observations récentes nombreuses et concordantes, tend cependant à se faire sur un modèle proche de celui de l'adulte.

Il semble malgré tout se dégager des éléments spécifiques à l'enfance et il est clair que leurs reconnaissance précoce permettrait d'apporter aux jeunes patients dépistés une thérapeutique adaptée, une aide à la verbalisation de l'expérience dont on peut espérer un rôle préventif sur la constitution du syndrome tout en en limitant les conséquences sur son développement psychoaffectif.

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Review Article

Current Concepts

POST-TRAUMATIC STRESS DISORDER

RACHEL YEHUDA, Ph.D.

THE terrorist attacks on the World Trade Center and the Pentagon on September 11, 2001, represented an amalgam of interpersonal violence, loss, and disaster. Tens of thousands of people ran for their lives in fear, were exposed to graphic scenes of death, or lost loved ones. It is estimated that well over 100,000 people directly witnessed the events, and many people around the world were also exposed to these horrifying scenes through the media.¹ The attacks were followed by the imminent threat of subsequent attacks, the prospect of war, and bioterrorism. These events have influenced and will continue to influence the clinical presentation of patients seeking health care services, and post-traumatic stress disorder (PTSD) will develop in a substantial number of people. On the basis of data obtained after the 1995 bombing of the Murrah Federal Building in Oklahoma City, which was previously the deadliest act of terrorism in America, one could predict PTSD will develop in approximately 35 percent of those who were directly exposed to the September 11 attacks.² In addition, many persons with prior exposure to traumatic events may have a recrudescence of PTSD symptoms triggered by news of catastrophic events and their distressing effects. Since traumatized persons with PTSD are far more likely to visit primary care physicians for their symptoms than mental health professionals, primary care practitioners will play an important part in identifying and treating this disorder.

DEFINITION OF PTSD

The defining characteristic of a traumatic event is its capacity to provoke fear, helplessness, or horror in response to the threat of injury or death.³ People who are exposed to such events are at increased risk for PTSD as well as for major depression, panic disorder, generalized anxiety disorder, and substance

abuse, as compared with those who have not experienced traumatic events.⁴ They may also have somatic symptoms and physical illnesses, particularly hypertension, asthma, and chronic pain syndromes.^{5,6}

To be given a diagnosis of PTSD, a person has to have been exposed to an extreme stressor or traumatic event to which he or she responded with fear, helplessness, or horror and to have three distinct types of symptoms consisting of reexperiencing of the event, avoidance of reminders of the event, and hyperarousal for at least one month (Table 1).³ Reexperiencing of the event refers to unwanted recollections of the incident in the form of distressing images, nightmares, or flashbacks. Symptoms of avoidance consist of attempts to avoid reminders of the event, including persons, places, or even thoughts associated with the incident. Symptoms of hyperarousal refer to physiological manifestations, such as insomnia, irritability, impaired concentration, hypervigilance, and increased startle reactions.²

Within the first month after a traumatic experience, traumatized persons may meet the diagnostic criteria for acute stress disorder. Although acute stress disorder is not always followed by PTSD, it is associated with an increased risk of PTSD.⁷

The symptoms of PTSD are readily identifiable by a primary care physician. Because there is substantial overlap between the symptoms of PTSD and those of depression and other anxiety disorders, however, the diagnosis is easily missed unless specific inquiries are made about the occurrence of a traumatic event. Often practitioners are reluctant to ask their patients about events that might be distressing or that might involve shame or secrecy, and patients will not usually mention such topics without prompting. By providing patients with the opportunity to disclose such events, practitioners break down an important barrier to treatment by legitimizing the event as a valid explanation for symptoms. Exposure to a traumatic event can often explain the presence of nonspecific symptoms such as palpitations, shortness of breath, tremor, nausea, insomnia, unexplained pain, and mood swings, as well as a reluctance to undergo certain types of examinations (e.g., rape victims may feel uncomfortable undergoing a gynecologic examination) and behavior such as nonadherence to treatment, which may be a manifestation of avoidance.⁸ Thus, otherwise unexplained physical symptoms or behavior may prompt clinicians to question patients about the possibility of traumatic experiences and the specific symptoms of PTSD.

From the Division of Traumatic Stress Studies and Department of Psychiatry, Mount Sinai School of Medicine and Bronx Veterans Affairs Medical Center, New York. Address reprint requests to Dr. Yehuda at Bronx Veterans Affairs Medical Center, 130 Kingsbridge Rd., Bronx, NY 10468, or at rachel.yehuda@med.nyu.edu.

CURRENT CONCEPTS

TABLE 1. DIAGNOSTIC CRITERIA FOR PTSD.*

A person must have been exposed to a traumatic event.
The event involved a perceived or actual threat to the person's own life or physical integrity or that of another, such as a physical or sexual assault, rape, a serious accident, a natural disaster, combat, being taken hostage, torture, displacement as a refugee, sudden unexpected death of a loved one, and witnessing a traumatic event.
The person's response to the event involved fear, helplessness, or horror.
The person persistently reexperiences the event in at least one of several ways:
The person has intrusive recollections of the event.
The person has nightmares.
The person has flashbacks, which are particularly vivid memories that occur while he or she is awake and make him or her act or feel as though the event was recurring.
The person has intense psychological distress in response to reminders of the traumatic event.
The person has intense physiological reactions in response to reminders of the event (including palpitations, sweating, difficulty breathing, and other panic responses).
The person avoids reminders of the event and has generalized numbness of feeling, as indicated by the presence of at least three of the following:
The person actively avoids pursuits, people, and places that remind him or her of the event.
The person avoids thinking of or talking about the event.
The person is unable to recall aspects of the event.
The person has lost interest in or participates less in activities.
The person has felt detached or estranged from other people since the event.
The person has a restricted range of emotions or a feeling of numbness.
The person feels as though his or her life has been foreshortened or as though there is no need to plan for the future, with respect to his or her career, getting married, or having children.
The person has symptoms of increased arousal, as evidenced by the presence of at least two of the following:
The person has difficulty falling or staying asleep (sometimes related to fear of having nightmares).
The person is irritable and has feelings or outbursts of anger.
The person has difficulty concentrating.
The person has become more vigilant and concerned about safety.
The person has exaggerated startle reactions in response to sounds or movements.
The three types of symptoms must be present together for at least one month.
The disorder must cause clinically significant distress or impairment in social, occupational, or other areas of functioning.

*There are three subtypes of PTSD. Acute PTSD refers to symptoms that last less than three months. Chronic PTSD refers to symptoms that last three months or longer. Delayed-onset PTSD refers to symptoms that begin at least six months after a traumatic event. Adapted from the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition.⁷

EPIDEMIOLOGIC ASPECTS

Before the September 11 attacks, studies of the prevalence of PTSD in the United States demonstrated that 5 to 6 percent of men and 10 to 14 percent of women had had PTSD at some time in their lives, making it the fourth most common psychiatric disorder.⁹⁻¹¹ Events that give rise to PTSD typically involve interpersonal violence (e.g., rape, assault, and torture) or exposure to life-threatening accidents (e.g., motor vehicle accidents) or disasters (e.g., fires and earthquake). Although the disorder is far more likely to occur after direct than indirect exposure to trauma,³ PTSD can occur in persons who have witnessed a violent injury to or the unnatural death of another person and those who have learned that a loved one was involved in such an event,¹² provided there is sufficient associated terror or shock.² Factors that contribute to the intensity of the response to a psychologically traumatic experience include the degree of controllability, predictability, and perceived threat¹³; the relative success of attempts to minimize injury to oneself or others; and actual loss.¹⁴ If the patient is wounded or exposed to pain, heat, or cold, the biologic and psychological experience can be intensified.¹⁵

Events that involve interpersonal violence give rise to PTSD more often than events such as motor vehicle accidents and natural disasters. For example, PTSD developed in 55 percent of persons who reported being raped, as compared with 7.5 percent of those involved in accidents⁴ and 2 percent of those who learned of traumatic events.¹⁶ One study reported that PTSD developed in approximately 14 percent of those who experienced the sudden, unexpected death of a loved one,¹⁶ making this event the single most frequent traumatic event to occur in both men and women, accounting for 39 percent of cases of PTSD in men and 27 percent of cases in women.¹⁷

Although women have a higher lifetime prevalence of PTSD, it is not clear whether this finding reflects an increased vulnerability to the disorder or the fact that seemingly similar events are experienced differently by men and women. Women are more likely than men both to be molested and to have PTSD in response to molestation (Table 2).⁴ However, PTSD also develops more often in women than men after a physical assault, such as mugging, despite the fact that these events are far less common in women (Table 2).^{4,16} In contrast, although women are more than 10 times as likely as men to be raped, the prevalence

of PTSD after rape is actually higher in men (65 percent vs. 46 percent).⁴ These statistics argue against an increased vulnerability to the disorder in women and instead suggest that certain experiences may involve different degrees of actual threat and physical injury. Nonetheless, because of the extremely high frequency of sexual and physical assault among women, more than 50 percent of cases of PTSD among women appear to result from such events, whereas only 15 percent of cases among men result from this type of trauma.¹⁷ The rates of PTSD in response to events such as accidents, natural disasters, or death of a loved one (Table 2) are statistically similar among men and women and suggest that the incidence of PTSD may be similar among men and women in the aftermath of September 11.

PSYCHOLOGICAL ASPECTS

The psychological and biologic response to a traumatic event is determined by the characteristics of both the event and the person involved.¹⁸ The initial response of fear is inherently biologic, but it can be influenced by the person's subjective interpretation of the event, which in turn is influenced by the person's previous experiences and other risk factors.¹⁹

Experiencing or learning about a traumatic event challenges a person's sense of safety, leading to feelings of vulnerability and powerlessness.^{19,20} Recovery from the event involves confronting human vulnerability in a way that promotes the development of resilience. However, the body's biologic responses in the aftermath of a traumatic event may perpetuate a state of fear that interferes with the restoration of feelings of safety, particularly if the result leads to further events, such as war.²¹ Living in a state of perpetual fear can overwhelm a person's coping resources and lead him or her to avoid thoughts and feelings associated with the traumatic event. Avoidance reduces opportunities to extinguish or diminish fear responses — for example, through exposure to information that could correct exaggerated beliefs²⁰ about the safety of the world and the fragility of the person — and prevents the development of effective coping strategies, resulting in further social, interpersonal, or occupational disruption.

Horror, anger, sadness, humiliation, and guilt can also occur in response to trauma.¹⁹ Many people blame themselves for failing to act in ways that could have averted the event or mitigated the circumstances of the event. No matter what the emotional response, the process of recovery requires acknowledgment of changes that have occurred as a result of the traumatic event. Although many traumatized persons attempt to avoid distressing emotions related to their experiences, being able to confront them will promote habituation, so that over time, their thoughts

TABLE 2. PREVALENCE OF TRAUMATIC EVENTS AND RATES OF PTSD IN RESPONSE TO SUCH EVENTS AMONG MEN AND WOMEN.

TRAUMATIC EVENT	PREVALENCE OF EVENT		RATE OF PTSD IN RESPONSE TO EVENT	
	MEN	WOMEN	MEN	WOMEN
	percent			
Rape*	0.7	9.2	65.0	45.9
Molestation*	2.8	12.3	12.2	26.5
Physical assault*	11.1	6.9	1.8	21.3
Accident†	25.0	13.8	6.3	8.8
Natural disaster*	18.9	15.2	3.7	5.4
Combat*	6.4	0.0	38.8	—
Witnessed death or injury†	40.1	18.6	9.1	2.8
Learned about a traumatic event†	63.1	61.8	1.4	3.2
Sudden death of loved one†	61.1	59.0	12.6	16.2
Any traumatic event*	60.7	51.2	8.1	20.4
Any traumatic event†	92.2	87.1	6.2	13.0

*Data are from Kessler et al.⁴

†Data are from Breslau et al.¹⁷

about and emotional responses to the event will become less distressing.²²

BIOLOGIC ASPECTS

The elucidation of the biologic changes related to PTSD has shed light on the question of why some people recover from traumatic events whereas others do not. Patients with chronic PTSD have increased circulating levels of norepinephrine²³ and increased reactivity of α_2 -adrenergic receptors.²⁴ These alterations, in tandem with the finding that thyroid hormone levels are increased in patients with PTSD,²⁵ may help explain some of the somatic symptoms of the disorder. Recent neuroanatomical studies have identified alterations in two major brain structures — the amygdala and hippocampus — in patients with PTSD. Positron-emission tomography and functional magnetic resonance imaging have shown that the reactivity of the amygdala and anterior paralimbic region to trauma-related stimuli is increased^{26,27} and the reactivity of the anterior cingulate and orbitofrontal areas is decreased.²⁸ These areas of the brain are involved in fear responses. Differences in hippocampal function²⁹ and in memory processes presumed to be dependent on the hippocampus have been found, suggesting a neuroanatomical substrate for the intrusive recollections and other cognitive problems³⁰ that characterize PTSD.

The biologic alterations observed in PTSD do not uniformly resemble those associated with other types

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of stress (Fig. 1). For example, cortisol levels have been lower than normal in some studies of patients with PTSD, even decades after a traumatic event.^{32,33} Paradoxically, however, levels of corticotropin-releasing factor in cerebrospinal fluid appear to be increased.³⁴ This pattern differs from the patterns associated with brief and sustained periods of stress and with major depression, which are typically associated with increased levels of both cortisol and corticotropin-releasing factor (Fig. 1). In PTSD the sensitivity of the negative-feedback system of the hypo-

thalamic-pituitary-adrenal axis is increased, as reflected by the exaggerated suppression of cortisol in response to dexamethasone administration^{35,36} and the increased sensitivity of lymphocyte glucocorticoid receptors.³⁷ These findings contrast with the well-demonstrated phenomenon of reduced cortisol suppression in response to dexamethasone³⁸ and findings of reductions in glucocorticoid-receptor sensitivity in major depressive disorder.³⁹

The psychological and biologic data support the hypothesis that the development of PTSD is facili-

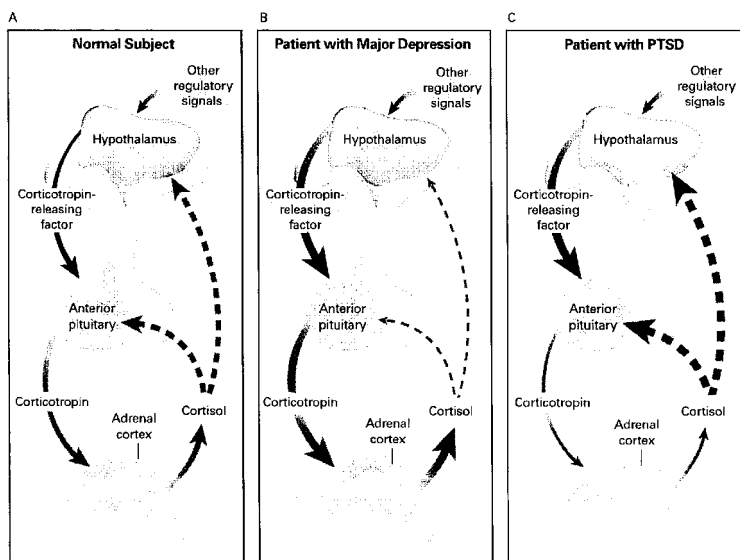


Figure 1. Response to Stress in a Normal Subject (Panel A), a Patient with Major Depressive Disorder (Panel B), and a Patient with PTSD (Panel C).

In normal subjects (Panel A) and in patients with major depression (Panel B), brief or sustained periods of stress are typically associated with increased levels of both cortisol and corticotropin-releasing factor. In each panel the thickness of the interconnecting arrows denotes the magnitude of the biologic response. Corticotropin-releasing factor stimulates the production of corticotropin, which in turn stimulates the production of cortisol. Cortisol inhibits the release of corticotropin from the pituitary and the release of corticotropin-releasing factor from the hypothalamus. It is also responsible for the containment of many stress-activated biologic reactions. In patients with PTSD (Panel C), levels of cortisol are low and levels of corticotropin-releasing factor are high. In addition, the sensitivity of the negative-feedback system of the hypothalamic-pituitary-adrenal axis is increased in patients with PTSD rather than decreased, as often occurs in patients with major depression.³¹

tated by a failure to contain the biologic stress response at the time of the trauma, resulting in a cascade of alterations that lead to intrusive recollections of the event, avoidance of reminders of the event, and symptoms of hyperarousal. This failure may represent an alternative trajectory to the normal process of adaptation and recovery after a traumatic event. Prospective studies have shown that patients in whom PTSD^{40,41} or symptoms of PTSD⁴¹ develop have attenuated increases in cortisol levels in the immediate aftermath of a traumatic event, which may be related to prior exposure to a traumatic event or other risk factors.⁴² They also have higher heart rates in the emergency room and one week later than persons in whom PTSD does not develop.⁴³ These findings suggest that patients with PTSD have a greater degree of activation of the sympathetic nervous system.

Decreased cortisol levels at the time of a traumatic event could prolong the availability of norepinephrine to synapses in both the periphery and the brain,^{44,45} which in turn might affect the consolidation of the memory of the incident. Adrenergic activation in the face of low cortisol levels facilitates learning in animals.⁴⁶ If this process also occurs in traumatized persons, the memory of the event not only would be strongly encoded, but also would be associated with strong, subjective feelings of distress. This feeling would most likely facilitate the development of altered perceptions and thoughts in the aftermath of the event, particularly those associated with the perception of danger or ability to cope with a threat. These altered perceptions would further delay recovery by leading to a failure to quell fearful responses, which would further strengthen maladaptive cognitive responses to trauma and fear, perpetuate the symptoms of PTSD, and trigger a series of secondary biologic changes. Indeed, the exaggerated startle reaction is not usually seen in patients with PTSD until one month after the event, reflecting the progression of at least some biologic aspects.⁴⁷ Further research may enable us to identify those at greatest risk for PTSD on the basis of combined biologic and psychological characteristics.

TREATMENT

Counseling

An important component of treating traumatized persons is the provision of education, a feeling of safety, and support, which can be done by primary care providers. Education helps patients understand the nature of their condition and the process of recovery. Patients should be made to understand that their symptoms represent a psychobiologic reaction to overwhelming stress rather than a character flaw or a sign of weakness. Clinicians can provide a noncritical ear and emphasize that patients are not alone.

Such intervention can help build a therapeutic alliance and help patients see the need for therapy. Traumatized persons are notoriously reluctant to seek help for their symptoms, particularly from mental health practitioners. This reluctance may result from a lack of awareness on the part of patients that their symptoms are linked to a traumatic event or from concern that they will be seen as "damaged" or emotionally unstable. Many survivors fear that there may be job-related consequences of the disclosure or treatment of a traumatic event; for example, a police officer may lose the right to carry a weapon, and a politician may be viewed as insufficiently stable. Supportive counseling by primary care providers can help address many of these barriers to further care.

Alleviating the symptoms of PTSD usually requires the use of specialized techniques that help patients confront fears and emotional responses to the traumatic event in a more structured format, without becoming overwhelmed. Treatment involves reducing the level of distress associated with memories of the event and quelling the resultant physiological reactions. Research has demonstrated the effectiveness of such techniques as exposure therapy (helping patients confront painful memories and feelings), cognitive therapy (helping patients process their thoughts and beliefs), anxiety management, and interpersonal therapies (helping patients understand the ways in which the traumatic event continues to affect relationships and other aspects of their lives). Group therapy may also be helpful in reducing isolation and stigma.⁴⁸

Medications

Medications can also benefit traumatized persons and can be prescribed by a primary care physician. Results of randomized clinical trials demonstrate that medications such as selective serotonin-reuptake inhibitors,^{49,50} tricyclic antidepressants,⁵¹ and monoamine oxidase inhibitors⁵² alleviate the symptoms of PTSD and are associated with improvements in overall functioning. Serotonin-reuptake inhibitors are a first-line medication because they are safer and better tolerated than other types of psychotropic medications. Sertraline (Zoloft) and, more recently, paroxetine (Paxil) are the only agents that have been approved by the Food and Drug Administration for the treatment of PTSD. The Expert Consensus Guidelines on the treatment of PTSD⁵³ recommend that if there is no response to an eight-week trial of a serotonin-reuptake inhibitor, treatment should be switched to nefazodone (Serzone) or venlafaxine (Effexor); if there is a partial response, a mood stabilizer such as divalproex (Depakote) should be added. These recommendations are based on the results of a survey of prominent physicians with clinical experience in PTSD, but

such algorithms are not empirically based, since there have been no double-blind, placebo-controlled studies of either nefazodone or venlafaxine.

Benzodiazepines should be avoided or used very judiciously in patients with PTSD. Randomized, double-blind trials found that alprazolam (Xanax) was not significantly better than placebo in patients with chronic PTSD⁵⁴ and that neither alprazolam nor clonazepam was better than placebo immediately after a traumatic event.⁵⁵

Further research is needed to determine whether some groups of patients with PTSD have a preferential response to one type of treatment. The decision to use psychotherapy, pharmacotherapy, or a combination of the two depends on the overall clinical picture. Pharmacologic agents targeting the specific constellation of biologic alterations in PTSD have not yet been developed. Rather, pharmacotherapy for PTSD has involved administering agents with established efficacy in other mood and anxiety disorders.

Referral

Primary care physicians may choose to refer patients for specialized treatment if initial interventions have not been successful or patients have side effects from medication. Some traumatized persons may also have suicidal thoughts and behavior, other serious psychiatric problems, substance abuse, and ongoing stress in addition to that relating to the event that precipitated PTSD. As noted above, another complicating factor in the referral process is the reluctance of patients to be treated by mental health professionals. The establishment of mental health treatment programs in primary care settings represents an important future goal.

SUMMARY

Although most people will gradually recover from the psychological effects of a traumatic event, PTSD will develop in a substantial proportion. PTSD appears to represent a failure to recover from a nearly universal set of emotions and reactions and is typically manifested as distressing memories or nightmares related to the traumatic event, attempts to avoid reminders of the trauma, and a heightened state of physiological arousal. Studies of the biologic mechanisms of PTSD have delineated circumscribed alterations in brain regions, such as the amygdala and hippocampus, that are associated with fear and memory, as well as changes in hormonal, neurochemical, and physiological systems involved in coordinating the body's response to stress. The treatment of PTSD involves educating the patient about the nature of the disorder, providing a safe and supportive environment for discussing traumatic events and their impact, and relieving the distress associated with memories and re-

mindings of the event. A variety of approaches, such as exposure therapy, cognitive therapy, and pharmacotherapy, have been found to be effective in the treatment of PTSD.

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ANNEXE 15

Le syndrome de stress post-traumatique

Le syndrome de stress post-traumatique est une forme de trouble anxieux qui fait suite à un événement particulièrement traumatisant sur le plan psychologique : attentats, bombardements, accidents graves, catastrophes, violences physiques, viols... Quels sont ses principaux symptômes ? Quels traitements proposer ?

La personne qui présente le tableau de stress post-traumatique peut être la victime elle-même de l'événement. Elle peut être le témoin d'un accident survenu à un proche, ou d'une catastrophe ayant concerné de nombreuses victimes.

Le tableau se présente sous la forme d'une sorte de retour permanent de l'événement, sous forme de cauchemars, ou d'envahissement de la conscience chez le sujet éveillé, de souvenirs fréquents.

Ces troubles s'accompagnent souvent d'insomnies, de dépression, d'irritabilité, parfois de violences ou de conduites pathologiques (alcoolisme...). Au maximum ils entraînent une désadaptation sociale importante.

**Quelles en sont les causes, quelle est l'évolution ?**

Confrontées au même événement traumatisant, certaines personnes n'en subissent pas de séquelles et d'autres développent un syndrome de stress post traumatique. On parle de syndrome de stress post-traumatique lorsque les symptômes durent plus d'un mois (ils débutent souvent plusieurs semaines après l'événement). La durée des troubles peut se limiter à quelques mois, ou au contraire durer beaucoup plus longtemps voire devenir chronique.

Quel est le traitement ?

Il est souvent difficile. Certains médicaments sont utiles pour traiter les symptômes tels que dépression (antidépresseurs) ou anxiété (anxiolytiques). Mais le traitement de fond repose en règle générale sur la psychothérapie, soit psychothérapie d'inspiration analytique, soit psychothérapie comportementale. Le soutien de la famille et des proches est important mais le recours à un thérapeute spécialisé est souvent nécessaire.

Dr Christian Duchêne