

Canine leishmaniosis and euthanasia in Italy: a critical legal-ethical analysis

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Summary

The increasing awareness that control of zoonotic visceral leishmaniosis (ZVL) depends on effective control of canine leishmaniosis has promoted research into leishmanial infection in dogs, but has also encouraged the indiscriminate elimination of seropositive dogs. Public health campaigns in various parts of the world (e.g. in Brazil and China) are designed to reduce the incidence of human ZVL by targeting/killing dogs. However, not all situations are the same; in Italy, for example, there would be little support for this type of control measure because attitudes towards animals are different. Moreover, research has suggested that the destruction of seropositive dogs is a relatively ineffective control measure. In this context, the authors reflect on some epidemiological, ethical and juridical aspects, aiming to contribute to the discussion and to find more feasible solutions.

Keywords

Canine leishmaniosis – Ethics – Euthanasia – Italy – Killing – Law – Stray dog.

Introduction

Canine leishmaniosis (CanL) caused by *Leishmania infantum* is a disease of great significance in veterinary medicine and represents a serious public health problem. Infected dogs constitute the main domestic reservoir of the parasite and play a key role in transmission to humans, in whom the parasite produces visceral leishmaniosis in both the Old and New Worlds (29).

CanL is endemic in several countries from different parts of the world (Europe, Africa, Asia and the Americas) (2). In Europe, CanL is widespread not only in enzootic areas (known as such by the presence of autochthonous cases), but also in non-enzootic areas, including some countries of central Europe. This is principally due to the increased travel of pet dogs in and out of endemic areas, and as a consequence of climate change (70). For instance, the importation and relocation of dogs from endemic countries is responsible for the growing numbers of dogs with this disease in Germany (28); the increased numbers of travelling and imported companion animals have raised

serious concerns about the introduction of CanL into the United Kingdom (71).

A study from the Netherlands found that about 8,000 dogs a year are taken to southern Europe with their owners on vacation, and the risk of these dogs acquiring leishmaniosis is estimated to be between 0.027% and 0.23% (75). Even though the risk for autochthonous transmission from travelled dogs in the absence of sand-fly vectors is probably small, infection has been described in dogs with no travel history living together with imported infected dogs, pups born to infected dams, or animals receiving blood transfusions from infected canine donors (16, 18, 69).

The European countries considered, entirely or in part, 'enzootic areas' are: Albania, Bosnia-Herzegovina, Crete, Croatia (82), Cyprus, France, Greece, Malta, Portugal, Spain and Italy (54).

In Italy, the traditionally enzootic areas are the central and southern regions (Liguria, Tuscany, Lazio, Campania,

Basilicata, Calabria, Puglia, Molise and Abruzzo, Sicily and Sardinia) (10, 13, 41, 51, 53, 57, 80).

New stable foci of CanL have appeared, in the Marche, Emilia Romagna, Umbria, Veneto, and Piedmont regions (11, 31, 43), previously regarded as non-endemic (41). In north-eastern Italy, new imported cases of CanL have been notified outside the original area of first infection, and established foci have been recently detected (11, 12, 27, 64, 65, 77).

While in non-endemic areas, *L. infantum* infection mainly causes severe clinical forms of the disease (43), in endemic areas, most of the affected dogs remain asymptomatic (55). Nonetheless, asymptomatic animals can play a role in maintaining the infection in an endemic area by transmitting the infection to dogs and other receptive hosts, including humans (47).

In Italy there seems to be an increase in cases of human (Table I) and canine leishmaniosis and this is arousing a strong interest among human and veterinary medical professionals who are searching for solutions and the best tools of control. Data can be compared with those coming from other parts of the world, even if situations may be somewhat different.

Table I
Reported human leishmaniosis cases in Italy

Year	Number of cases	
	Visceral leishmaniosis	Cutaneous leishmaniosis
1995	144	35
1996	145	33
1997	136	23
1998	112	21
1999	143	17
2000	185	28
2001	159	40
2002	174	44
2003	128	45
2004	175	69
2005	152	73
2006	113	36
2007*	67	15

*The data for 2007 are not final

Source: www.ministerosalute.it

In Iran, where the disease is found mostly in rural areas, seropositivity among children was found to increase with village dog density and dog ownership was a significant risk factor for child seropositivity (26).

Canine visceral leishmaniosis in the United States was rarely reported before 2000, when infection was

implicated as the cause of mortality in a foxhound kennel in New York State (22, 25). More recently, a serosurvey revealed that canine infection, predominantly involving foxhounds, is in fact present in 18 states and two Canadian provinces (21).

The number of infected dogs in South America is estimated in millions, and there are high infection rates in some areas of Venezuela and Brazil, where a high prevalence of canine infection is associated with a high risk of human disease (78).

In these countries, but also in China (39), public health campaigns are designed to reduce the incidence of human zoonotic visceral leishmaniosis (ZVL) by targeting/killing dogs (19, 74).

Over the past 20 years, in most Latin American countries there has been a major migration of people from rural to urban areas. The new migrants often bring with them dogs, chickens, and pigs, which they keep in or around their houses, thus creating an excellent habitat for the vectors of *L. infantum* (1). This type of mass movement of people and animals occurred in Brazil, where leishmaniosis is a notifiable disease, and approximately 2,000 *Leishmania*-infected dogs per month are now euthanised by the Ministry of Health. The dogs to be culled are selected following a positive diagnosis of infection, i.e. the detection of *Leishmania*-specific antibodies in the blood (36, 46, 49). This dog control programme is justifiable because the disease occurs in poor rural and suburban areas and it is usually associated with other human diseases, such as human immunodeficiency virus (HIV) infection. *Leishmania infantum* appears as an opportunistic parasite in those with HIV infection and in other immunosuppressed individuals (17). Immunosuppression is one of the factors responsible for increased susceptibility to primary *Leishmania* infection or to reactivation of a silent infection. From 1985 until the late 1990s, *Leishmania*-HIV co-infection was considered to be an emerging disease in southern Europe, where 25% to 70% of adult cases of *Leishmania* infection were related to HIV infection and up to 9% of patients with acquired immune deficiency syndrome suffered from newly acquired or reactivated visceral leishmaniosis (15). *Leishmania* and HIV co-infections have been reported in 35 out of the 88 countries in which leishmaniosis is endemic (15) and are a growing concern in eastern Africa, Brazil and the Indian subcontinent, where both diseases overlap geographically (70).

In the authors' opinion a policy of killing infected pet dogs, such as exists in Brazil, would not have public support in European countries, where dogs are often considered part of the family, and research has suggested that it is not a very effective control measure (14, 50, 52, 56). Ashford *et al.*, for example, state that seropositive dog removal is never completely efficient, because the elimination of the

seropositive dogs may affect the cumulative incidence of seroconversion in dogs temporarily (8).

Given these considerations, an evaluation of some ethical and juridical aspects of euthanasia of dogs with leishmaniosis was undertaken.

Making decisions about animal euthanasia

Being a veterinary professional entails making decisions of consequence and helping to ensure that those decisions are morally acceptable in a given situation. Usually a decision requires an ethical consideration and a clinical judgement. The necessary principles and tools are provided by professional ethics. For instance, the Italian Ethical Code (IEC) of rights and responsibilities of veterinarians places equal emphasis on professional obligations for protecting animal health, relief of animal suffering, conservation of animal resources and promoting public health, as do similar oaths from other countries (61).

Article 1 of the IEC states that a veterinarian should act to preserve the health and welfare of the animal, protect the interests of the owner, safeguard public health and the environment, and further the position and function of veterinary medicine in society.

Veterinarians are professionals who must make decisions that influence the destiny of animals and affect the lives of people and that carry a great deal of responsibility. They also have to balance the well-being of animals under their care with the protection of other animals and public health (63).

The bulk of routine veterinary work is preventive, rather than curative. It is aimed at preserving animal resources and keeping animals fit and healthy in order that they may efficiently service human needs, whatever those needs may be. Veterinarians are continually engaged in performing routine procedures pertaining to the management, control and prevention of disease and parasitic infection.

Some of the major contagious animal diseases have important economic consequences and must be eliminated from a population at almost any price (i.e. bluetongue, foot and mouth disease, contagious vesicular stomatitis, etc.). With the increase of international trade and travel, the risks of disease are no longer restricted to states or even continents. This is why large animal practitioners usually spend a large amount of time protecting livestock against a wide variety of infectious diseases which could otherwise impede production and the livestock and meat trade. Likewise, the small animal practitioner spends much of their time vaccinating the companion animal population.

The procedures that veterinarians are asked to perform and the decisions which they are required to make about their animal patients often present a host of practical, moral and ethical problems. In some instances, they are legally restricted from performing particular surgical interventions, such as declawing cats or tail-docking and debarking dogs, and can avoid having to deal with the ethical implications of such procedures. In many situations, however, the veterinarian's own personal judgement is relied upon and he must make weighty decisions as to what course of action should be taken.

There is, of course, a legal obligation to report suspicious cases to the authorities, however, drastic measures are likely to follow and so should be anticipated beforehand. It is impossible to provide simple guidelines as to what action should be taken when a suspected case tests positive for the disease, because they depend on the event and on the extent and the severity of the disease. When a suspected case is confirmed, serious economic damage (but also social and emotional) could be inflicted upon the owner of the animals.

The consulting veterinarian is in a very difficult position and must decide exactly what to do, how to do it and when to do it. Of course, there is no dilemma the moment a case becomes confirmed by strong evidence or an established diagnosis.

In suspected cases of animal diseases it is important to consider the interests of the following:

- the animals
- the owners
- the veterinarians
- the animal population
- public health.

It is also important to think about possible economic consequences.

Animal interests

Considering that animals, like humans, have an interest in not suffering and that humans have a moral obligation not to inflict unnecessary suffering (20, 24, 73, 76), it will be necessary to assess the benefits of clinical treatment against the benefits of destruction and the benefits of the absence of epidemic diseases in the population.

Owner interests

Considerations for the owners include: the hygiene precautions they may have to take, the cost of treatment, the likelihood that the treatment will be successful, the

suitability of the animal for its intended use after healing, the direct economic losses that they may incur and the compensation (full or partial) that they may or may not receive.

Veterinarian interests

The professional must consider the health and well-being of animals, the relationship with the client, and the responsibility towards both protecting public health and maintaining the economic value of a product.

Interests of an animal population

It is important to bear in mind the epizootic potential of an animal disease that could put future generations of the population in danger.

Public health interests

Health risk for workers or consumers must be taken into consideration, as should ensuring the availability of nutritious and safe foodstuffs at a reasonable cost.

Economic interests

It is important that the cost of animal products remain reasonable, for both primary producers and related businesses.

The interests of the animal and its owner are not always reconcilable. The course of action that a veterinarian must take is often dependent upon the species with which he is dealing and its economic or emotional value, irrespective of the nature of the medical complaint and its treatability.

Euthanasia: ethical and legal considerations

There is great variation in the value that people place upon animals (60, 62). Some animals are treated as members of the family, others are neglected, exploited or pragmatically used to meet human food demands. Some species are in different categories at the same time in the same countries, e.g. rabbits or dogs. There is a clear connection between the type of owners that a veterinarian sees and the kind of treatment that their animals receive; this being largely dependent upon the category of animal to which they belong, i.e. companion or farm animal. The attitudes of owners with regard to paying for and deciding to proceed with veterinary treatment also vary greatly. For some

animal owners the decision to go ahead with a life-saving operation or drug therapy is a highly emotive and problematic one, for others it is very simple and is decided purely upon pragmatic grounds. Furthermore, the animal's condition need not actually be life-threatening for a decision to end the animal's life to be made.

In small animal practice, ending an animal's life is commonly known as 'euthanasia'. This term is seen as particularly problematic when used to refer to healthy animals being killed, from a moral point of view, unnecessarily (23). Animal rights philosophers have strongly objected to the use of the term 'euthanasia' as a blanket description for the deliberate killing of pet animals. They argue that the term is entirely inappropriate unless certain conditions are met: firstly, that the animal is killed by the most painless means possible; secondly, that the owner who decides to end the animal's life truly believes that a painless death is in the animal's own interests; and finally, that the veterinarian who euthanises it is motivated to euthanasia out of a concern for the animal's interests, good or welfare (67).

Tannenbaum defines euthanasia as the 'act of inducing a painless death' (72). The American Heritage Dictionary identifies euthanasia as 'the act or practice of ending the life of an individual suffering from a terminal illness or an incurable condition, as by lethal injection or the suspension of extraordinary medical treatment'. It is considered a medical decision and should always be done in an individual animal's best interest. It can be an important part of end-of-life care. But most animals that die in pounds and shelters are killed for very different reasons. Facilities kill animals to make room for new ones, to manage disease, or to compensate for inadequate staff or funding. Decisions to kill reflect the operating interests of facilities, not the best interests of animals.

Euthanasia has long been seen as an acceptable way to deal with sick or unwanted animals. When there is no hope for recovery, and the animal is suffering, euthanasia certainly is the moral and appropriate choice (63). Refusing treatment is far less understandable or supportable if the owner does not try to obtain help for a companion animal which is in pain.

In veterinary medicine, unlike in human medicine, the practice of euthanasia is only rarely criticised and there is very little regulation to control its use. Animals can be euthanised with few objections, whatever the circumstances. As there is so little opposition to the euthanasia of animals it will be difficult to limit the practice without the introduction of more stringent legislation.

In Italy, the only juridical regulation of euthanasia is contained in Law no. 281/91, which concerns companion animals and stray animals, and in some regional laws

(e.g. Sicilian Parliament Law no. 15 [4]) which are related to the application of the National Law concerning stray/homeless dogs and cats.

Law no. 281/91 permits euthanasia of stray animals only in certain extreme cases, as follows:

- an animal suffering from a serious/incurable disease
- an animal known to be dangerous (either for its behaviour or because it is suffering from a zoonotic disease with a great impact on public health).

In this context, it is interesting to observe that the World Organisation for Animal Health (OIE) recognises the importance of controlling dog populations without causing unnecessary or avoidable animal suffering. The chapter on stray dog population control in the OIE *Terrestrial Animal Health Code* states:

‘Euthanasia of dogs, [...] is not an effective control measure. If used, it should be done humanely and in combination with other measures to achieve effective long-term control [...].’

In the situation where many dogs are owned, a population control programme that focuses on neutering and responsible ownership may be more appropriate. It is recommended that before adopting this approach, a cost-benefit analysis is conducted. Factors such as the monetary costs, impact on culture of ownership and public safety should be assessed as well as the benefits for disease control and animal welfare as well as any societal benefits.

c) If this method is adopted, the following factors should be addressed: [...]

iv) disease control may include blanket vaccination (e.g. rabies) and treatments and testing for diseases (e.g. leishmaniosis) followed, as appropriate by treatment or euthanasia of the dog; [...]

If euthanasia of these unwanted animals is the only option, the procedure should be conducted in accordance with the regulations of the Competent Authority [...]’ (79).

To be certain that euthanasia can be fairly practised on *Leishmania*-infected dogs it is first necessary to consider whether the illness is fatal or incurable and is proven to be dangerous. Only a veterinarian has the authority to decide to practise euthanasia on stray animals, except in cases of rabies, when it is the Mayor of the city who authorises killing rabid dogs (art. 83-92 of the Italian Veterinary Health Regulation [VHR]) (3). The decision must be based on his/her scientific knowledge and personal experiences

and the responsibility for the choice of method of intervention is his/hers alone; therefore, such a choice must be made after detailed diagnostic tests have made a certain diagnosis possible (58).

The fact that the law specifies ‘serious and incurable disease’ would appear to make euthanasia clinically and ethically justifiable only when the animal has a serious and irreversible disease (i.e. terminal illness or progressively debilitating disease), characterised by pointless suffering and an unfavourable prognosis.

With regard to the matter of when an animal should be considered as having been ‘proved dangerous’, it is important to underline that dangerous behaviour must be evaluated in each dog and must be unequivocally verified. For the law, this means that euthanasia may be practised only on stray dogs which have been seen to be dangerous in actual cases which endangered public safety. As mentioned above, animals affected by a zoonotic disease and therefore dangerous for man can also be considered to belong to this group.

The VHR, which concerns infectious and spreading diseases, contains detailed instructions about the obligation of reporting to the authorities, and the isolation, confiscation and culling of animals affected by listed zoonoses.

Leishmaniosis, however, is barely considered in the VHR list; it is only mentioned in article 5 of the regulation that prescribes a mutual exchange of information about cases between the veterinary and medical services, with the aim of adopting suitable health measures through special ordinances enacted by the Ministry of Health.

Given that leishmaniosis is a zoonotic disease, the exchange of information between human doctors and veterinarians is very important, as it enables them to better coordinate efforts to control the disease. This exchange should aim to achieve cooperation between researchers, health workers and professionals in an attempt to optimise the use of their knowledge and experience of leishmaniosis.

Proposals and discussions

In the light of all the foregoing considerations, can euthanasia in a dog affected with leishmaniosis be considered as complying with the law?

There are many instances of negative comments about the euthanasia of all seropositive animals: it is difficult to put into effect, it is not ethically acceptable and it has not given good results when it has been done. In fact, as reported above, the removal of the seropositive dogs may affect the

cumulative incidence of seroconversion in dogs temporarily (8) or destroyed dogs may be immediately replaced by susceptible puppies, and quite often, by already infected dogs; and other reservoirs may be involved in maintaining canine infection (50).

Killing infected dogs is an acceptable solution in poor countries that have neither the funds nor the facilities to house and treat infected animals, and in which dogs constitute a pest rather than a pet. This option is not acceptable, however, in developed countries that have the capacity to provide treatment and in which the dogs are considered family members by their owner and are commonly referred to as 'man's best friend'. For many people, companion animals have value and sentimentality associated with them, and for some they are the *only* family members they have. Studies show that the grief responses following the death of a companion animal are comparable to those experienced upon the loss of a spouse, parent, or child (5).

The best alternative would seem to be veterinarians and doctors working together to rapidly identify, examine and treat cases of *L. infantum*, and to correctly inform the public, with the intent to protect the health of humans and dogs. Besides improving surveillance and reporting of CanL this would maintain or establish an effective mechanism for collating, processing, analysing and disseminating disease data. This is the solution which seems to be preferred by the VHR. In fact, article 5 of the Regulation, as already mentioned, examines the zoonotic aspects of *Leishmania* infection in the dog and indicates that the exchange of information between health officers and veterinarians is very important for the adoption of suitable health precautions. If euthanasia was thought to be a useful measure, it would surely have been expressly specified. It is clear that the aim is to identify and treat all infected dogs and, at the same time, to adopt measures to effectively control the sand-fly vector (*Phlebotomus* spp).

Socio-cultural factors play a significant role in the spread of the disease: pet dogs which are kept indoors and are checked regularly by a veterinarian are better protected against the disease; less pampered pets live outside even at night, are not given regular veterinary care and may end up as strays. Law no. 281/91 attempts to limit the increase in stray dogs by creating municipal shelters and a dog register. This Italian law provides for two types of care centre for dogs: 'hospital' kennels and shelters. The former simply treat the dogs and make sure they are not a danger to public health, they then move to the latter, which must maintain their well-being and attempt to re-home them. This is an attempt to solve the problem of crowded municipal dog-pounds, which can become impossible to run properly, with a consequent failure to guarantee the well-being of the dogs.

Of course, the law means that infected and clinically ill dogs will go to hospital kennels to receive appropriate treatment and make a good clinical recovery. In these cases, however, the biological cycle of disease is not interrupted. This therapy is suggested by the Superior Institute of Health for clinically ill animals or animals which have a positive immunofluorescent-antibody test (IFAT) (antibody IFI $\geq 1:160$) or a positive polymerase chain reaction (PCR). However, given that carrying out these tests and providing treatment is expensive, one wonders what really happens to the dogs with leishmaniosis held in the 'hospital' kennels. Indiscriminate use of euthanasia is not considered to be ethically justified, even before taking into account the opposition from animal protection societies. Euthanising *Leishmania*-infected dogs would be potentially very dangerous as it could appear to justify euthanasia for all animals affected by any zoonotic disease.

The World Health Organization takes the same view as animal protection societies and only contemplates euthanasia in serious cases, such as those indicated in Law no. 281/91. In municipal dog-pounds it is necessary to make a complete clinical, serological and parasitological diagnosis before euthanasia is practised. Dogs not in terminal stages can be treated. Some authors (2, 32) state that the treatment of *L. infantum*-infected dogs is an unfeasible control strategy, not only because of affordability but also because treated and clinically cured dogs often relapse and remain infectious to the sand-fly vector, increasing the risk of drug-resistant parasite strains developing. Recently, the Canine Leishmaniosis Working Group, an Italian expert group established in 2005, suggested that the prevention of canine leishmaniosis could only be realised with a 'no feeding' strategy (42).

The future for CanL control should provide for solutions integrated with an approach to prevention, i.e. population vaccination against *L. infantum* and the use of deltamethrin collars (44, 68) or other long-acting topical insecticide applications (48). A successful leishmaniosis eradication campaign in the developing world should include programmes for the control of stray dog populations as well as systemic vaccination of owned dogs or use of topical insecticides. Mirò *et al.* (48) suggest that topical insecticides can prevent new infections and reduce sand-fly feeding on dogs that are already infected, whereas a vaccine would prevent the establishment of infection introduced by bites from those sand-flies that have escaped the insecticide effect.

These solutions must be implemented gradually. It is essential that all the norms of prevention be adopted and that therapy be carried out, so that euthanasia is envisaged only in the cases where it is really inevitable. Euthanasia must only be for individual cases, and not a generalised matter, because this disease is not an epidemic. Generalised euthanasia is not in the spirit of the law.

Other useful strategies would be information campaigns for dog owners, both to encourage correct care for their animals and to limit alarm and worry. For example, outside the endemic zone, veterinarians should provide appropriate advice to owners of travelling dogs concerning prevention of infection and correct application of preventative measures before returning.

Proposals for indiscriminate euthanasia of dogs held in state or municipal animal shelters do not seem justified, because the suspicion that it is being used for reasons other than to end animal suffering (for example, to reduce numbers) could arise.

As in all cases of evaluating health problems, ‘quick-fix’ solutions should not be adopted. The conclusion, therefore, is that the choice of euthanasia for dogs affected by leishmaniosis when the symptoms are not proved ‘serious’, ‘incurable’ or ‘proven to be dangerous’ is illegal in Italy.

Conclusions

Although several studies on many aspects of CanL have been carried out over the last decade, additional issues still

need to be better investigated and further knowledge acquired about vector, pathogen and host interactions. This would provide new information to help manage CanL in endemic areas, thus reducing the risk of occurrence of new foci in non-endemic zones.

Monitoring the disease, mainly in areas where there are stray untreated dogs, is a necessity for planning control strategies for CanL. While stray dogs represent an easy feeding source for sand-fly vectors and a reservoir of pathogens, the scant economic resources and the current legislation that obliges the public health authorities to maintain municipal kennels for stray dogs (in which animals often remain untreated against ectoparasites), probably represent the major impediments to the control of CanL in Italy as well as in other Mediterranean countries.

Leishmaniosis should be included in the list of infectious and contagious notifiable diseases in article 1 of the VHR, concerning obligatory reporting to the authorities. This would oblige private veterinarians to report every single case of CanL that they assess to the health authorities.

Efforts should be made to prevent CanL from entering new countries or regions where conditions for transmission



European Union
(MEMBER STATE)

PET PASSPORT

ISO Code MS + Number

Disease			
<hr/>			
Pathogen			
<hr/>			
Test	Result	Result	Result
<hr/>			
IFAT			
<hr/>			
ELISA (antibody)			
<hr/>			
ELISA (antigen)			
<hr/>			
PCR			
<hr/>			
Cytology			
(bone marrow, lymph node, blood)			
<hr/>			
Histopathology			
<hr/>			
Other test results			
<hr/>			
Positive	[]	[]	[]
Negative	[]	[]	[]
Doubt	[]	[]	[]
<hr/>			
Date and signature			
<hr/>			

ELISA: enzyme-linked immunosorbent assay
IFAT: immunofluorescent-antibody test

ISO: International Organization for Standardization
PCR: polymerase chain reaction

Fig. 1
Example of a disease reporting page that could be added to European Union pet passports

exist. A special health booklet for every dog (or an additional page in the pet passports of countries which have them [Fig. 1]), in which the veterinarian would record all diseases the animal has had, plus relevant diagnostic information, would be desirable. It is important to identify:

a) suspected cases based on clinical signs, e.g. local or generalised lymphadenopathy, exfoliative/ulcerative skin disease, splenomegaly, weight loss/anorexia, renal failure (glomerulonephritis caused by immune-complexes), ocular disease, epistaxis, lameness; and suspected cases based on supporting tests for one or more of the following: non-regenerative anaemia, hyperglobulinaemia, thrombocytopenia, proteinuria or uremia.

b) confirmed cases based on clinical signs as described above and one or more of the confirmatory laboratory tests (59). In general, the most satisfactory techniques are (30): IFAT, enzyme-linked immunosorbent assay (6) and the direct agglutination test (35, 81). Several molecular biological techniques (i.e. PCR assays) have been developed for the sensitive detection and identification of pathogens (7, 9, 31, 33, 34, 37, 38, 40, 45, 66).

Dogs visiting endemic areas should be protected by insecticides or vaccines.

Measures of this kind would bring advantages in the control and management of this zoonosis, thus preventing fraudulent trade in infected animals and providing greater guarantees for those buying dogs.

Global collaboration, expertise, leadership, technology transfer and good veterinary governance in compliance with international standards are needed. In particular, veterinarians, scientists, clinicians and public health officials must come together to share their experience in modern leishmaniosis control and to agree on the strategies for the prevention and control of the disease in reservoir animal species.

In conclusion, to prevent human deaths, laboratory-based surveillance, combined with active health education, enhanced public awareness, and the strategic use of potent, inexpensive vaccines in animals are key priorities. They are also basic requirements for effective leishmaniosis prevention and control in developed countries such as Italy. ■

La leishmaniose canine en Italie et la pratique de l'euthanasie : analyse critique des aspects juridiques et éthiques

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Résumé

On admet désormais qu'une des conditions préalables pour contrôler la leishmaniose viscérale zoonotique est de lutter efficacement contre la leishmaniose canine ; cette prise de conscience, si elle a fortement favorisé les travaux de recherche sur la leishmaniose chez le chien, a eu également pour effet d'encourager l'élimination systématique des chiens trouvés séropositifs. Dans plusieurs endroits du monde (notamment au Brésil et en Chine), des campagnes de santé publique ont privilégié l'abattage des chiens comme moyen de réduire l'incidence de la leishmaniose viscérale chez l'homme. Toutefois, toutes les situations ne sont pas comparables. En Italie par exemple, une telle mesure de lutte serait mal accueillie car incompatible avec la manière dont les animaux sont perçus dans ce pays. En outre, des travaux scientifiques ont montré que l'élimination des chiens séropositifs est une mesure de lutte relativement peu efficace. Dans ce contexte, les auteurs examinent certains aspects épidémiologiques, éthiques et juridiques de la question afin de nourrir le débat et de trouver des solutions plus réalistes.

Mots-clés

Abattage – Chien errant – Éthique – Euthanasie – Italie – Législation – Leishmaniose canine. ■

Análisis crítico de los aspectos jurídico-éticos de la leishmaniosis canina y la eutanasia en Italia

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Resumen

La creciente conciencia de que la lucha contra la leishmaniosis visceral zoonótica (LVZ) pasa por un control eficaz de la leishmaniosis canina ha supuesto un impulso a las investigaciones sobre la infección por *Leishmania* en los perros, pero también ha propiciado una eliminación indiscriminada de los perros seropositivos. En varias partes del mundo (por ejemplo en Brasil y China) hay campañas de salud pública destinadas a reducir la incidencia de la LVZ humana localizando/sacrificando perros. Pero no todas las situaciones son iguales. En Italia, por ejemplo, donde impera otra mentalidad con respecto a los animales, este tipo de medidas de lucha obtendrían escaso respaldo. Además, las investigaciones llevan a pensar que el sacrificio de perros seropositivos es una medida de lucha relativamente ineficaz. En tal contexto, los autores reflexionan sobre una serie de aspectos epidemiológicos, éticos y jurídicos con ánimo de contribuir al debate y ayudar a encontrar soluciones más factibles.

Palabras clave

Derecho – Ética – Eutanasia – Italia – Leishmaniosis canina – Perro vagabundo – Sacrificio.



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