



Health professionals' knowledge about prevention and control of leishmaniosis

Graziella Borges Alves¹; Talita Carolina Bragança de Oliveira¹; Nicole Alessandra Nodari¹; Larianne Maria Belloto de Francisco¹; Walter Bertequini Nagata¹; Jancarlo Ferreira Gomes²; Katia Denise Saraiva Bresciani^{1}*

¹Universidade Estadual Paulista (UNESP), Faculdade de Medicina Veterinária, Araçatuba, São Paulo, Brasil

²Instituto de Computação (Laboratory of Image Data Science/LIDS), Universidade Estadual de Campinas (UNICAMP), São Paulo, Brasil. Faculdade de Ciências Médicas, Universidade Estadual de Campinas (UNICAMP), São Paulo, Brasil

***Corresponding Author(s): Katia Denise Saraiva Bresciani**

Rua Clóvis Pestana, Bairro: Ipanema, Araçatuba, São Paulo, Brasil
Tel: 55-18-3636-1370; Email: bresciani@fmva.unesp.br

Abstract

Leishmaniasis is an important worldwide disease with a zoonotic potential that presenting visceral and cutaneous clinical forms. The domestic dog is seen as the main reservoir of *Leishmania* spp. and for this reason, it is the target of the control program in some countries. The health professionals' knowledge about prevention and control of leishmaniasis was investigated. Through interviews with health professionals from endemic regions, it was observed that there are several conceptual gaps about leishmaniasis. Therefore, it is essential to put into practice the concepts of single health, bringing human, animal and environmental health, next to population.

Received: Sep 05, 2018

Accepted: Jan 17, 2019

Published Online: Jan 21, 2019

Journal: Journal of Community Medicine

Publisher: MedDocs Publishers LLC

Online edition: <http://meddocsonline.org/>

Copyright: © Bresciani KDS (2018). *This Article is distributed under the terms of Creative Commons Attribution 4.0 International License*

Keywords: Leishmaniasis; Sand flies; Prevention; Veterinarians

Abbreviations: VL: Visceral Leishmaniasis; CL: Cutaneous Leishmaniasis; CVL: Canine Visceral Leishmaniasis; MCL: Mucocutaneous Leishmaniasis

Cite this article: Alves GB, de Oliveira TCB, Nodari NA, de Francisco LMB, Bresciani KDS, et al. Health professionals' knowledge about prevention and control of leishmaniosis. J Community Med. 2019; 1: 1011.



Introduction

Leishmaniasis is an infectious disease transmitted by vectors, caused by different species of the genus *Leishmania* [1]. This disease is transmitted to humans and domestic and wild animals by the bite of females sand flies during blood repast [2].

Classically, there are two main clinical forms of leishmaniasis: Visceral Leishmaniasis (VL) and Cutaneous Leishmaniasis (CL). Although VL is more severe, CL is more widespread worldwide. According to estimates, approximately 0.4 million cases of VL and 1.2 million cases of CL occur annually. More than 90% of global VL cases occur in only six countries: India, Bangladesh, Sudan, South Sudan, Brazil and Ethiopia. However, cutaneous leishmaniasis is widely distributed, with about one third of cases occurring in the Americas, the Mediterranean basin and western Asia, the Middle East to Central Asia [3].

Visceral leishmaniasis, known as kala-azar, is a zoonotic and parasitic disease caused by obligate intracellular protozoa of the genus *Leishmania*. The most common *Leishmania* species are *Leishmania donovani* and *Leishmania infantum* or also known as *Leishmania chagasi*. The parasite is transmitted to humans and animals through the bites of female sand flies infected [4], of the genus *Lutzomyia* [5,6] and *Pintomyia* [7,8].

Cutaneous leishmaniasis in the New World is an autochthonous disease caused by different *Leishmania* species (Ross, 1903), that present a zoonotic character in which the wild animals play an important role in the maintenance of the cycle. However, due to the environmental modifications there are occurrences of synanthropic and domestic animals in the cycle of this disease. To date, twelve *Leishmania* species are responsible for cutaneous leishmaniasis in the Americas, three belonging to the subgenus *Leishmania*, nine to the subgenus *Viannia*. Due to the *Leishmania* species diversity involved and a wide geographical distribution, there are also a variable number of vectors [9].

The domestic dog (*Canis familiaris*) is seen as the main reservoir for *Leishmania* spp. For this reason, it is the target of a control program in some countries, such as Brazil [10]. Canine Visceral Leishmaniasis (CVL) is recognized as an important disease that is present in four continents and is endemic in more than 70 countries, affecting almost 2.5 million dogs [11].

For the control of this zoonosis, the main recommendation is euthanasia [12]. However, it does not have total approval of the population, due to the importance of the pets to their tutors [13]. Also, part of the scientific society questions the real effectiveness of this measure [13,14]. However, public health should not exceed ethical values, but seek clever and creative options to control the harm done to the community [15].

Therefore, the health education and social mobilization actions that play an essential role in the field of visceral leishmaniasis surveillance and control are important, since they represent a transformative potential in the construction of new tools for the prevention and control of this disease [16].

Considering the involvement of health professionals in the leishmaniasis prevention and control directly with the population, this review was carried out to verify the professionals' knowledge in relation to these diseases. Thus, we investigate the health professionals' knowledge regarding visceral and cutaneous leishmaniasis. We carried out this work with the objective of investigating professionals' knowledge regarding visceral and cutaneous leishmaniasis.

Methods

The search for articles was carried out in August 2018, in the databases: LILACS (Bireme) and Pubmed, with the descriptors "Knowledge OR Awareness OR Perceptions AND Veterinarians AND Healthcare Professionals AND Visceral Leishmaniasis".

Inclusion criteria: publication date (as of 2013), language (English and Portuguese). The first step was based on the analysis of the title and abstract of the manuscripts with the intention of selecting those that met the selection criteria. After this step, the articles were analyzed in their entirety and included those who approached the health professionals' knowledge regarding visceral and cutaneous leishmaniasis (Figure 1).

As exclusion criterion were articles with paid access, as well as monographs, dissertations, theses and abstracts of congresses.

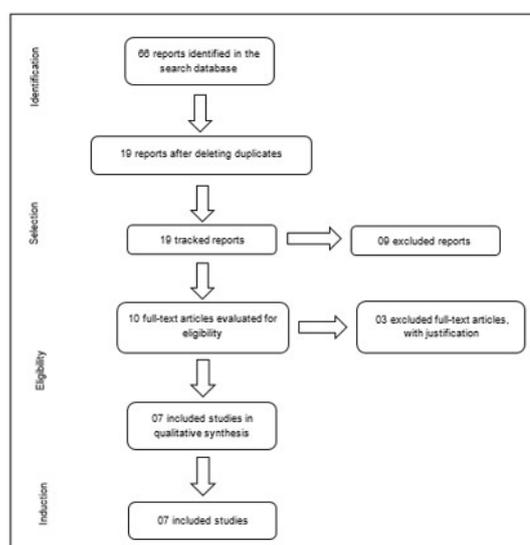


Figure 1: Flow of information with the different phases of a systematic review.

Results and discussion

In studies carried out in four Brazilian states, Mato Grosso (MT) [17], Pernambuco (PE) [18], São Paulo (SP) [19] and Minas Gerais (MG) [20,21], endemic for visceral leishmaniasis, the health professionals' knowledge about VL was investigated. Although they had direct contact with patients and dogs infected with *Leishmania* spp., all had doubts about VL (Table 1).

In endemic regions for VL and CL in the state of Minas Gerais, Brazil, research with health professionals (endemic disease control agents, community health agents and zoonotic agents) unsatisfactory results were observed in relation to the questions about clinical manifestations, popular names of the disease, transmission [20], preventive and control measures [21].

With increasing deforestation, human migration and urbanization, the leishmaniasis is a growing concern for professionals working in public health in many countries [22]. This is happening in the city of San Pedro, Asunción, Paraguay, where the highest levels of endemicity of cutaneous Leishmaniasis (LC) and Mucocutaneous (CML) in the country were verified, due to the increase in deforestation as a consequence of its agricultural and livestock economy [23]. Health professionals (nurses, nursing assistants and physicians) who had experience with CL and MCL underwent a prior knowledge assessment. Most had already seen a lesion of these diseases, and that it affected

mainly the nose and mouth [24], and they knew that the disease is transmitted by sand flies vectors [25]. However, health professionals request a routine and standardized diagnosis and treatment for CL and MCL so that all patients can receive simple information to raise awareness in the community [23].

In Europe, questionnaires were sent to 459 veterinarians with the intention of assessing the level of awareness of these professionals about the spread of visceral leishmaniasis in the continent. In an endemic region of Spain, 82% of veterinarians always indicate some measure to their clients, dogs tutors, compared to only 37% in the South and 0% in the north of France in non-endemic regions. The main preventive measures recommended were repellents, topical insecticidal application, vaccination and administration of domperidone [26]. In Brazil, the first option was vaccine application [17,19] followed by topical use of insecticides (sprays on), repellent spray and use of repellent collars [19].

These professionals also advised about the environmental management, daily cleaning with the organic matter collection, the maintenance of the garbage capped, the trash-free yard [19], in order to avoid the proliferation and shelter of sand flies in these environments [27].

In health education it is possible to reconcile concepts about the cycle, symptoms and preventive measures of leishmaniasis

to the population habits, which may be able to minimize the impact of these diseases [20], since that measures are put into practice [18]. In this scenario, health professionals are extremely important to link knowledge and the population [28], therefore the need for continuous training [20], thus generating a link between the population and the Health System [29].

Therefore, these professionals should be on alert with the recommendations indicated by the Ministry of Health and WHO, as well as participate in permanent education, as well as educational actions with the community, through preventive activities to combat this disease.

Conclusion

Health professionals demonstrate doubts in epidemiology, preventive and control measures of visceral and cutaneous leishmaniasis, so the need to elaborate a permanent education where these professionals contextualize the information about this disease to their reality.

Acknowledgement

FAPESP (Foundation for Research Support of the State of São Paulo), process nº 2017/24538-0, for the financing of the doctoral scholarship of the author and for the budget for the development of her project.

Tables

Table 1: Characteristics presented in the five articles discussed in the review, type of questionnaire, interviewed number, profession and statistical analysis used.

Articles	Type of questionnaire	Interviewed number	Profession	Statistical analysis
Ruoti et al., 2013	Structured Questionnaire	25	Physicians, Nurses and Nursing Assistants	Descriptive Statistics
Menezes et al., 2014	Self-administered questionnaire	228	Zoonoses and community health agents; Physicians; Nurses; Dentists and Veterinarians	Descriptive statistics and absolute and relative frequency.
Igarashi et al., 2014	Closed Questionnaire	67	Veterinarians	Not displayed
Camargo et al., 2015	Questionnaire	40	Veterinarians	Chi-square (χ^2) or Fisher's exact tests, using a significance of 5%.
Marques et al., 2015	Structured Questionnaire	64	Health professionals	Inferential statistics, using the significance level of 5%
Carmo et al., 2016	Semi structured interview	19	endemic disease control agents and community health agents	Not displayed
Le Rutte et al., 2018	Online Questionnaire	459	Veterinarians	T-Tests and chi-squared tests. 95% confidence

References

- Shirian S, Oryan A, Hatam GR, Daneshbod Y. Three Leishmania/L. species—L. infantum, L. major, L. tropica—as causative agents of mucosal leishmaniasis in Iran. *Pathogens and Global Health*. 2013; 107: 267-272.
- Ready PD. Biology of phlebotomine sand flies as vectors of disease agents. *Annu Rev Entomol*. 2013; 58: 227-250.
- Alvar J, Velez I, Bern C, Herrero M, Desjeux P, et al. "Leishmaniasis worldwide and global estimates of its incidence". *PLoS ONE*. 2012; 7: 1-12.
- Schönian G, Mauricio I, Cupolillo E. Is it time to revise the nomenclature of Leishmania?. *Trends in Parasitology*. 2010; 26: 466-469.
- Galati EAB, Nunes VL, Rego Junior FA, Oshiro ET, Rodrigues M. Estudo de flebotomíneos (Diptera, Psychodidae) em foco de leishmaniose visceral no Estado de Mato Grosso do Sul, Brasil. *Rev de Saúde Pública*. 1997; 31: 378-390.
- Oliveira EF, Oshiro ET, Fernandes WS, Murat PG, Medeiros MJ, et al. Experimental infection and transmission of Leishmania by Lutzomyia cruzi (Diptera: Psychodidae): Aspects of the ecology of parasite-vector interactions. *PLOS Negl Trop Dis*. 2017; 11: 1-23.
- Travi BL, Vélez ID, Brutus L, Segura I, Jaramillo C, et al. Lutzomyia evansi, an alternate vector of Leishmania chagasi in a Colombian focus of visceral leishmaniasis. *Trans R Soc Trop Med Hyg*. 1990; 84: 676-677.

8. Galvis-Ovallos F, Silva MD, Bispo GBS, Oliveira AG, Gonçalves Neto JR, et al. Canine visceral leishmaniasis in the metropolitan area of São Paulo: *Pintomyia fischeri* as potential vector of *Leishmania infantum*. *Parasite*. 2017; 24: 1-10.
9. Brazil RP, Rodrigues AAF, Andrade Filho JD. Sand Fly Vectors of *Leishmania* in the Americas - A Mini Review. *Entomology Ornithology & Herpetology*. 2015; 4: 1-4.
10. Dantas-Torres F, Solano-Gallego L, Baneth G, Ribeiro VM, Paiva-Cavalcanti M, et al. Canine leishmaniasis in the Old and New Worlds: unveiled similarities and differences. *Trends in Parasitology*. 2012; 28: 531-538.
11. Kaszak I, Planellas M, Dworecka-Kaszak B. Canine leishmaniasis - an emerging disease. *Annals of Parasitology*. 2015; 61: 69-76.
12. Dantas-Torres F, Brito ME, Brandão-Filho SP. Seroepidemiological survey on canine leishmaniasis among dogs from an urban area of Brazil. *Veterinary Parasitology*. 2006; 140: 54-60.
13. Costa CHN. How effective is dog culling in controlling zoonotic visceral leishmaniasis? A critical evaluation of the science, politics and ethics behind this public health policy. *Revista da Sociedade Brasileira de Medicina Tropical*. 2011; 44: 232-242.
14. Otranto D, Dantas-Torres F. The prevention of canine leishmaniasis and its impact on public health. *Trends in Parasitology*. 2013; 29: 339-345.
15. Castro JM, Rodrigues SM, Tarso S, Costa FL, Rodrigues ACCP, et al. Conhecimento, Percepções de Indivíduos em Relação à Leishmaniose Visceral Humana Como Novas Ferramentas de Controle. *Ensaio e Ciência: Ciências Biológicas, Agrárias e Saúde*. 2016; 20: 93-103.
16. Rangel O, Hiramoto RM, Henriques LF, Taniguchi HH, Ciaravolo RMC, et al. Classificação epidemiológica dos municípios segundo o Programa de Vigilância e Controle da Leishmaniose Visceral Americana no Estado de São Paulo, para 2013. *Boletim Epidemiológico Paulista*. 2013; 10: 3-14.
17. Igarashi M, Santos VJD, Minozzo ES, Lemos RS, Muraro LS, et al. Avaliação do nível de conhecimento dos médicos veterinários do município de Cuiabá e Várzea Grande – Estado de Mato Grosso sobre a leishmaniose visceral. *Veterinária e Zootecnia*. 2014; 21: 595-603.
18. Marques SR, Souza ACM, Ramos JVA, Santana IM, Costa VMS, et al. Percepção de profissionais de saúde e professores de escolas públicas de Igarassu – PE sobre a Leishmaniose Visceral. *Ciência Veterinária nos Trópicos*. 2015; 18: 277-280.
19. Camargo TC, Bondan EF. Conhecimento sobre leishmaniose visceral canina na população do município de Cotia (SP), Brasil, e participação dos clínicos veterinários locais na propagação de medidas preventivas. *Revista Brasileira de Ciência Veterinária*. 2015; 22: 28-33.
20. Menezes JA, Maia KN, Verne RN, Madureira AP, Schall VT, et al. Leishmanioses: o conhecimento dos profissionais de saúde em área endêmica. *Revista Brasileira em Promoção da Saúde*. 2014; 27: 207-215.
21. Carmo RF, Luz ZMP, Bevilacqua PD. Perceptions of the population and health professionals regarding visceral leishmaniasis. *Ciência & Saúde coletiva*. 2016; 21: 621-628.
22. Desjeux P. The increase in risk factors for leishmaniasis worldwide. *Transactions of the Royal Society of Tropical Medicine and Hygiene*. 2001; 95: 239-243.
23. Ruoti M, Oddone R, Lampert N, Orué E, Miles MA, et al. Mucocutaneous leishmaniasis: knowledge, attitudes, and practices among paraguayans communities, patients, and health professionals. *Journal of Tropical Medicine*. 2013; 1-10.
24. Goihman-Yahr M. American mucocutaneous leishmaniasis. *Dermatologic Clinics*. 1994; 12: 703-712.
25. Reithinger R, Dujardin JC, Louzir H, Pirmez C, Alexander B, et al. Cutaneous leishmaniasis. *Lancet Infectious Diseases*. 2007; 7: 581-596.
26. Le Ruttea EA, van Stratenb R, Overgaauw PAM. Awareness and control of canine leishmaniasis: A survey among Spanish and French veterinarians. *Veterinary Parasitology*. 2018; 253: 87-93.
27. Lainson R, Rangel EF. *Lutzomyia longipalpis* and the eco-epidemiology of American visceral leishmaniasis, with particular reference to Brazil - A Review. *Mem Inst Oswaldo Cruz*. 2005; 100: 811-827.
28. World Health Organization-WHO. Control of the leishmaniasis: report of meeting of the WHO Expert Committee on the Control of Leishmaniasis. Geneva: World Health Organization; 2010.
29. Oliveira SF, Albuquerque FJB. Family health program: an analysis from the beliefs of their service providers. *Psicologia & Sociedade*. 2008; 20: 237-246.