Introduction

Visceral leishmaniasis is caused by parasites from the *Leishmania* *donovanii* complex, comprising *Leishmania* (*Leishmania*) *donovani*, *Leishmania* (*Leishmania*) *infantum* and *Leishmania* (*Leishmania*) *chagasi*, being the latter found in Brazil (Baneth 2006). The disease is considered endemic in 88 countries and approximately 12 million people worldwide are infected, and between 1.5 and 2 million new cases are being notified each year (Camargo et al. 2007). The clinical diagnosis of visceral leishmaniasis becomes a challenge for the veterinarian, due to the diversity of symptoms, many of which are not normally described in literature. Therefore, the proposal of this study is to show the main clinical aspects of 469 dogs naturally infected by visceral leishmaniasis in Araçatuba, as an aid for the diagnosis of the disease.

Material and Methods

For this study, 469 symptomatic dogs, naturally infected by *Leishmania chagasi* were assessed. All of them were sent to the Veterinary Hospital of São Paulo State University - Araçatuba-São Paulo - Brazil, during the year of 2005. The diagnosis of the disease was reached by the identification of amastigote forms of *Leishmania* sp. in the cytological examination of lymph node and bone marrow aspirates and confirmed by enzyme immune assay (ELISA) according to LIMA et al. (2005). After the confirmation of the diagnosis, all animals were submitted to a complete clinical examination, and the data were collected in individual charts.

Results

From the 469 dogs assessed, 53.7% were male and 46.3% were female. Regarding the age-group distribution, 11% of the dogs were less than one year old; 35% were between one and three years; 32% were between three and six years and 22% were older than six years. Concerning the disease’s duration by the time they were admitted into the Veterinary Hospital, 39% of the animals studied had displayed the first symptom in less than 15 days; 15% between 15 and 30 days; 19% between 30 and 60 days and 27% had displayed a clinical evolution of the disease ranging from two months to one year. Non-specific symptoms such as lymphadenomegaly, weight loss or cachexia, hyperthermia, paler mucous and hepatosplenomegaly were evidenced, respectively, in 74%, 49%, 39%, 19% and 25% of the dogs. Regarding dermatological lesions observed in 57% of the animals, the most frequent ones were alopecia (47% of the cases), ulcerative lesions (36%), pruritus (21%), exfoliative dermatitis (16%) and onychogryphosis (36%). Ulcerative lesions were found especially on salient bony areas of members, on the nasal bridge and on the auricular surface. However, some animals also displayed lesions on the footpad, on mucous-cutaneous transition zones and scattered throughout the body. Sloughing was more evident on face and body length. Several dogs also displayed a nasodigital hyperkeratosis. Papules were seen exclusively on Boxer dogs, particularly on face and body. Also bacterial infections with presence of purulent discharge and meliceric crusts on the lesions were observed. Gastrointestinal symptoms were reported in 57% of the dogs, 50% of which had hyporexia and 67% had vomiting and/or diarrhea. Urinary disturbances were confirmed in 15% of the dogs, through physical and laboratory evaluation. Clinical manifestations were polyuria and polydipsia in 71% of the animals. Through urine examination, proteinuria, hematuria and pyuria were evidenced in 11.4%, 11.4% and 8.5% of the animals, respectively. Ophthalmic alterations, characterized especially by conjunctivitis, blepharitis and uveitis were diagnosed in 13% of the dogs. Ascites with presence of transudate and sometimes amastigote forms of the parasite at sediment examination were confirmed in 8.5% of the cases. The same percentage of animals was referred with edema of limbs, followed or not by an arthropathies. Twenty-five dogs (5.3%) displayed an increase in the joint volume in twenty or more limbs, characterizing a polyarthritis. Dogs showing symptoms of pneumonia, such as dyspnea, purulent nasal discharge, productive cough and stertors upon auscultation corresponded to 8% of the total assessed animals. Some dogs (8%) showed neurological symp-
toms, such as paraparesis, seizures, walking in circles, head tilt, mandible paralysis, facial ptosis and miosis, with absence of co-infections. Evidence of hepatic damage was identified in 17 (3.6%) of the patients, which showed bilirubinuria (70.58%) and ictericia (29.41%). Epistaxis, a symptom that is frequently reported in literature, was observed in only 3% of the dogs.

Discussion and Conclusion

In the present study, no gender preference was observed, despite the number of males affected was slightly higher than females. Regarding age-group, approximately half of the dogs were less than three-years old. From the total, 49% of the dogs showed symptoms in less than one month, out of which 71% in less than 15 days, demonstrating the acute nature of the disease, as observed by Feitosa et al. (2000). Lymphadenomegalgy was, among unspcific symptoms, the most frequent one, evidenced both in popliteal and pre-scapular lymph nodes, confirming the reports of Feitosa et al. (2000). In lymphoid organs, the proliferation of B-lymphocytes, plasmaocytes and macrophages resulted in localized or generalized lymphadenomegalgy. Emaciation, found in 49% of the cases, is normally a sign of visceral involvement (Slappendel & Greene 1990, Ciaramella et al. 1997). Anemia, observed in 19% of the animals, occurs due to blood loss, hemolysis or, most frequently, to the decrease in erythropoiesis caused by medullary hypoplasia or aplasia (Slappendel & Greene 1990). Dermatological alterations are, according to the literature, the most common clinical manifestations of canine visceral leishmaniasis, being evidenced in 50 to 90% of the dogs presenting the clinical picture, a fact indeed confirmed by this study (Feitosa et al. 2000, Ciaramella & Corona 2003, Baneth 2006). Many dogs only showed dermatological symptoms; however, they probably already had a systemic involvement too, as the parasites usually are disseminated throughout before the onset of cutaneous lesions. The classical cutaneous form of visceral leishmaniasis is characterized by a non-pruriginous exfoliative dermatitis, with presence of white-silver scales (Papadogiannakis et al. 2005). However, in this study, areas of alopecia and ulcerative lesions were evidenced at a higher percentage than exfoliative dermatitis. Onychophagia was also observed in 36% of the cases, associated to the stimulation caused by the parasite in the ungual matrix and to a reduced use of the nails due to the apathy shown by the animal (Ciaramella et al. 1997, Noli 1999). The symptoms related to the digestive system consist of hyporexia or anorexia, vomiting and chronic diarrhea due to the presence of erosions on the gastrointestinal mucous, resulting in hematocita or melena. Enteritis may be the result of a direct damage caused by the parasite or, sometimes, a consequence of renal insufficiency (Ciaramella & Corona 2003, Baneth 2006). Polypuria and polydipsia can indicate a renal lesion and sometimes they are the only symptoms of the disease. Dogs may develop glomerulonephritis and interstitial nephritis, ending up in renal insufficiency which, according to literature, is the main cause of death of dogs (Slappendel & Greene 1990, Ferrer et al. 1995, Lopez et al., 1996). In the present study, only 15% of the dogs showed such symptoms. Approximately 20 to 40% of the dogs with visceral leishmaniasis have ocular problems, which vary from a simple blepharocconjunctivitis, with bilateral ocular discharge, a keratoconjunctivitis, lymphocytic or granulomatous uveitis, up to a severe panophthalmitis. These alterations occur due to the presence of amastigote forms of Leishmania sp. or as a consequence of an immune complex deposition on the iris and ciliary body (Ciaramella et al. 1997, Noli 1999). In the present study, only 13% of the dogs evidenced ophthalmic alterations, as they were animals referred exclusively to the Medical Clinic Service, that do not routinely treat ophthalmopathies. Other symptoms identified in dogs of this study were ascitis and edema of limbs, as a probable consequence of vasculitis associated to hepatic and renal lesions, which lead to hypoalbuminemia. Animals with visceral leishmaniasis still may show locomotor problems as a consequence of polymyositis, peripheral neuropathies, polyarthritis, synovitis, osteomyelitis or interdigital and footpad ulcers. The polyarthritic conditions have been more and more frequent in our clinical routine, being caused by the decrease in the parasite or by deposit of circulating immune complexes. The identification of amastigote forms in the synovial liquid is very often possible (Buracco et al. 1997, Agut et al. 2003, Feitosa et al. 2005). Neurological problems can be due to Leishmania sp. antigen deposit and immunoglobulins in the central nervous system, leading to an inflammatory process and histological alterations, such as deposit of anyloid substance and neuronal degeneration (Slappendel 1990, Noli 1999). Ictericia due to hepatic lesions caused by the parasite is rare, being observed in only five dogs. Epistaxis, normally unilateral and intermittent, can be due to thrombocytopenia, vasculitis caused by immune complexes or nasal mucous ulceration (Jüttner et al. 2001, Baneth 2006).

References


Keywords: visceral leishmaniasis, dogs, clinical signs, Araçatuba