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P 44 - Levels Of Trace Elements In Serum Of Dogs And Their Correlation To Occurrence Of Leishmaniasis

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Abstract
The chemical contamination of the environment is a considerably serious problem. The majority of dangerous chemical pollutants, considered particularly harmful for humans, especially children [1], are heavy metals, relating to water and soil contamination [1,2,3]. The main threats to human health are associated with exposure to lead, cadmium, mercury and arsenic. Although adverse health effects of heavy metals have been known for a long time, exposure to heavy metals continues and is even increasing in some areas [2]. The World Health Organization (WHO) estimates that about a quarter of all diseases are due to prolonged exposure to environmental pollution. Certain heavy metals have been reported to seriously affect the immune system potentially resulting in a broad range of harmful health effects. The link between metals and immune function has been studied for many years; developmental exposure to lead results in persistent immune alterations in rodents, including reduced antibody levels, altered cytokine production [4]. Some studies were conducted on the heavy metal content in serum of dogs to evaluate the degree of exposure in urban or industrial areas [5]. Another study checked a potential link among histopathology and some trace elements in canine visceral leishmaniasis, a severe and fatal systemic chronic inflammatory disease [6]. The present study was aimed at determining trace element concentration in serum of dogs to evaluated if high levels of heavy metals are a factor contributing to vulnerability to leishmaniasis. Blood samples were collected from 19 leishmaniotic dogs and 74 not leishmaniotic dogs. All the 93 animals were from different geographic areas of Campania Region, endemic for L. infantum.
The analysis was carried out using a validated analytical method based on inductively coupled plasma mass spectrometry (ICP-MS), and the data recorded were statistically processed in order to give a contribution to risk assessment. Blood samples obtained from dogs were kept at room temperature for 30 min and centrifuged at 3000 rpm for 15 min to separate the serum. The serum samples were transferred in eppendorf tubes and stored at −80°C until analysis. Aliquots (500 µL) of serum samples were transferred in metal- free polyethylene tube and they were diluted to 10.0 mL with HNO_3 1% (v/v).
The determination of 16 trace elements (As, Hg, Pb, Cd, As, Sr, V, Ni, Se, Cr, Mo, Li, Cu, Zn Mn and Fe) was carried out by an ICP-MS mod NexION 350X (Perkin Elmer, Waltham, MA-USA). All measurements were conducted in duplicate.
Trace element concentrations were calculated by using calibration curves and were expressed as mg/L. The limits of quantification (LOQ) were calculated as the blank signal plus ten times its standard deviation, respectively.
Monitoring of trace elements was carried out. Regarding the differences between not leishmaniotic versus leishmaniotic dogs, the results obteined in this preliminary study showed that: the mean quantity of Fe was

4,259 ug/mL + sd vs 2,763ug/mL + sd, Mn was 0,006ug/mL + sd vs 0,008ug/mL + sd, Sr was 0,057 ug/mL vs 0,064 ug/mL.

The differences between the average quantities of the other metals did not show statistically significant differences. Future studies will be needed to assess the correlation of leishmaniosis with serum metal concentrations.

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