HEMOSTATIC ASSESMENT IN ADVANCED STAGES OF CANINE VISCERAL LEISHMANIOSIS ASSOCIATED WITH PROTEIN LOSING NEPHROPATHY

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Abstract

Protein losing nephropathy (PLN) associated to advanced stages of leishmaniosis causes hemostatic thromboembolic disease. For this reason, better knowledge of the alterations of biomarkers that evaluate hemostasis and their prevalence is necessary to categorize the risk of these patients and get a correct management.

Introduction

PLN has been related to a higher incidence of thromboembolic phenomena in dog. Patients with canine visceral leishmaniosis (CVL) can develop PLN and suffer its hemostatic complications, especially groups with severe renal disease. Complete pathophysiology of these problems remains unclear, but it has been associated with hypercoagulable stages by renal loss of antithrombin III (ATIII) and development of disseminated intravascular coagulation (DIC). It is characterized with a prolongation of clotting times and an increase in the D-dimer concentration (DD).

Due to this, a better knowledge of the clinical hemostatic alterations in the advanced stages of CVL is necessary to evaluate the risk of these patients. Main objectives of our study were to evaluate the prevalence of these disorders in stages III and IV of CVL and their survival.

Methodology

Fifteen dogs were included in this prospective observational study (Image 1). All of them were diagnosed with PLN and assigned to LeishVet stages III and IV. Hematology, biochemistry and complete urinalysis with urine protein:creatinine (UP/C) ratio were performed. Abdominal ultrasound and echocardiography were carried out as well (Image 2).

Image 1. Female 3 years old patient with CVL. Patient had a severe cachexia and claudication of hind limbs.

Hemostatic status was evaluated by platelet count, times of thrombin (TT), prothrombin (PT) and activated partial thromboplastin (aPTT). These were measured with a coagulometer (CLOT-1; RAL®; Spain). Automated latex particle immunoassay (D-Dimer HemosIL®; Italy) was used to determine DD. ATIII activity was analyzed using molecular absorption spectrometry (BCS® XP System; Germany).

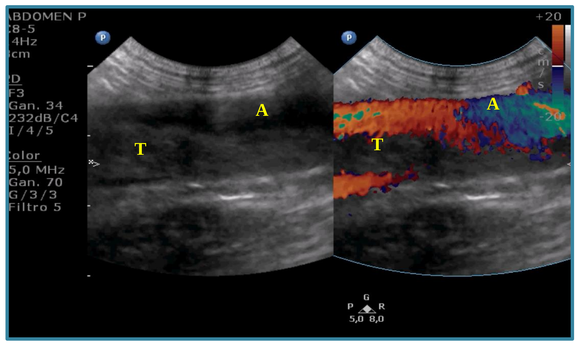

Image 2. Focused abdominal aorta ultrasound in a patient with CVL and aortic thromboembolism. Comparison between B and color doppler modes. (A) Aorta. (T) Thrombus.

Results

Patients were included in advanced Leishvet groups (stage III, n=7; stage IV, n=8). The mean age was 70.4 months (23-128). Platelet count was normal in all cases in stage III; thrombocytopenia was observed in one dog in stage IV. Abnormalities in secondary hemostasia were found in stage III and IV. respectively, such as prolongation of: TT (1/7; 3/8), PT (1/7; 0/8) and aPPT (2/7; 4/8)(Image 3). Decreased ATIII activity was observed only in 3 dogs in stage IV (Image 4), even when all patients exhibited marked proteinuria (UP/C ranged 1.2 to 12.9). Increased DD values were found in all dogs.

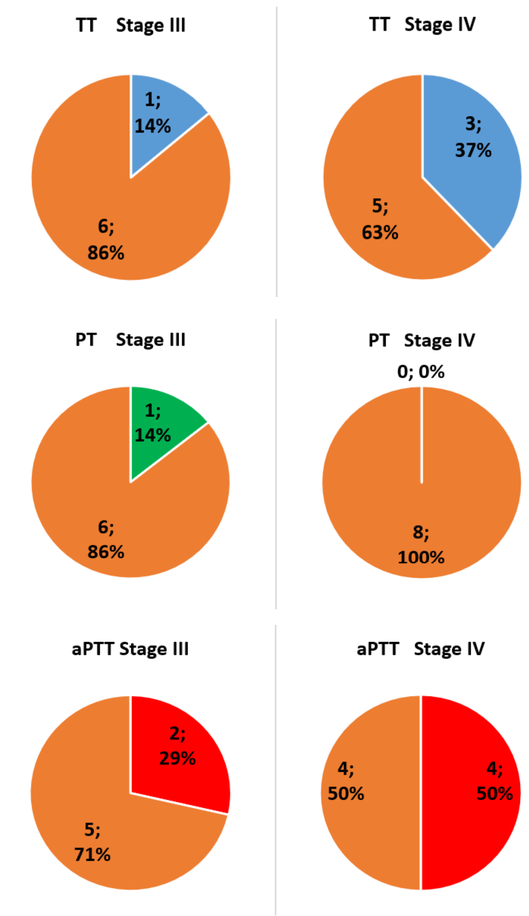

Image 4. Graphic representation of prevalence of prolongation of the clotting times in stages III and IV.

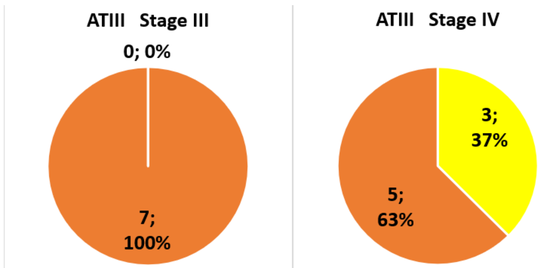

Image 4. Representation of prevalence of patients with decreased ATIII activity in stages III and IV.

Clinically, four patients (one in stage III and three in stage IV) met the criteria for the diagnosis of DIC and two dogs enclosed in LeishVet IV suffered thromboembolic events. Patients in stage IV presented higher mortality rates compared to stage III patients (62.5% vs 0% respectively) after three months. A student t-test was used, but no statistically significant differences were observed when surviving and non-surviving groups were contrasted ($p>0.05$) for any of the hemostatic parameters.

Conclusion

Dogs in advanced stages of CVL exhibit alterations in the intrinsic coagulation pathway and increased DD; decreased ATIII was only observed in some patients included in LeishVet IV. Antithrombotic prophylaxis should be considered in patients with this disease.

Acknowledgements

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