Abstract

Leptospirosis is a bacterial disease caused by pathogenic strains of Leptospira, which may affect human beings and a wide range of both domestic and wild animals. The disease in dogs is still a challenge for clinicians, since definitive diagnosis may be reached only few days after overt clinical signs. Besides that, dogs with leptospiruria have zoonotic risk, making development of rapid screening tests crucial for early diagnosis of disease. C-reactive protein is a positive acute phase protein, and in the dog a strong and fast response is expected after any tissue injury. The aim of this study was to evaluate serum and urinary C-reactive protein as potential early indicators of leptospirosis in dogs, and its association with clinical serum biochemistry, complete blood count (CBC) and clinical outcome. Materials, Methods & Results: A total of 62 dogs with risk factors and/or clinical signs of leptospirosis were prospectively obtained and included in this study. Definitive diagnosis was based on serology, using the microscopic agglutination test (MAT) against 13 serovars, and on a specific polymerase chain reaction (PCR) in blood or urine, using the primers sets G1/G2 and B64I/B64II, which amplify DNA of pathogenic leptospires. Clinical serum biochemistry included creatinine, urea, alanine aminotransferase, alkaline phosphatase, creatine kinase and albumin. C-reactive protein was performed in serum and urine using a semi-quantitative latex-agglutination test. A total of 49/62 (79%) dogs had a positive diagnosis of leptospirosis. From these, 12 (24.5%) had positive blood PCR, 17 (34.7%) positive urine PCR and 43 (87.7%) had positive serology. Concurrent positive serology and positive PCR (blood or urine) occurred in 19 (38.8%) dogs, whereas 24 (49%) dogs had positive serology only, and 6 (12.2%) dogs had positive PCR only. Dogs with negative results at serology and PCR were kept for analysis and participated as negative control group. Out of the 62 dogs, 25 (40.3%) had high liver enzymes, 18 (29%) had azotemia, 23 (37.1%) had leukocytosis, 37 (59.7%) had high creatine kinase levels and 37 (59.7%) had hypoalbuminemia. Twelve death cases (19.3%) occurred within 10 days after the sample collection. Positive serology was significantly associated with urinary C-reactive protein (P = 0.038). Only a weak association was found between serum C-reactive protein and blood PCR (area under curve= 0.68). There was no association between urinary C-reactive protein and urine PCR, urinary C-reactive protein and blood PCR, serum C-reactive protein and positive serology, or serum C-reactive protein and urine PCR. Increased liver enzymes (P = 0.04) and hypoalbuminemia (P = 0.002) were associated with high levels of serum C-reactive protein. There was no association between serum or urinary C-reactive protein and death. Discussion: In this study, it was hypothesized that increased blood C-RP may be expected in dogs having leptospiremia, whereas increased urinary C-RP may be expected in dogs having leptospiruria. However,
the results showed that C-reactive protein was not useful to predict leptospiremia or leptospiruria in the naturally infected dogs of this study; and although association between urinary C-reactive protein and seropositivity was observed, it should not be used as a unique test for leptospirosis. In conclusion, although C-reactive protein may be used as part of a screening profile, it should not be considered as indicator alone of leptospirosis screening in dogs.

Keywords

Dog, leptospirosis, diagnosis, serology, PCR, screening, C-reactive protein.