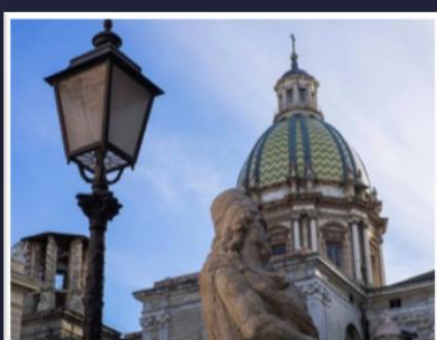
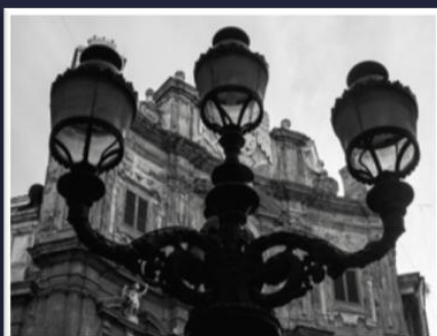




# SOCIETÀ ITALIANA DELLE SCIENZE VETERINARIE



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**13 -16 Giugno 2016**

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## **INVESTIGATION OF CRP AND OTHER HEMATIC INFLAMMATION MARKERS IN DOGS**

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The systemic reaction to acute inflammation, also known as acute phase response, induces some hemato-biochemical changes, which can be evidenced in laboratory findings. The C Reactive Protein (CRP) is a main acute phase response protein elective in dogs to detect inflammatory disease. Other blood parameters have been described as useful inflammation markers i.e. Fibrinogen and Leukocytes (1, 2, 3).

The aim of this retrospective study was to investigate the CRP values in comparison to Fibrinogen (Fib), Albumin (Alb), and Iron (Fe) values, total White Blood Cell (WBC), Segmented Neutrophil (NeuSeg) and Band Neutrophil (Band) counts, and the occurrence of Toxic Neutrophils (Neu TOX), Activated Monocytes (Mon ATT), and Reactive Lymphocytes (Linf REA) in blood smears.

For this purpose, data of 1,837 blood samples was collected over a three-year period (2012-2015). Data collected for each sample included: Fib, Alb, Fe, WBC, NeuSeg, Band, Neu TOX, Mon ATT, Linf REA and CRP, as well as information regarding dog's age, breed, and gender.

Blood samples were divided into 2 groups: "inflammatory"; CRP  $\geq 0.30$  mg/dL (#1080) and non-inflammatory; CRP  $\leq 0.29$  mg/dL (#757). The 2 groups were compared using: Chi squared for sex, breed, and age; Relative risk (RR) for age; Spearman Rank correlation test (SRct) for all parameters studied; Multiple regression (MR) to assess the relationship between CRP and other inflammation markers; Receiver Operating Characteristic (ROC) curves for diagnostic accuracy of each parameter in comparison to CRP (MedCalc®, 14.8). Dogs belonging to inflammatory group were significantly older (>7 years old) than those of non-inflammatory group ( $P < 0.05$ ), (RR, 1.38). Low yet significant ( $p < 0.01$ ) correlations between CRP and the other markers were noted using the SRct (R): CRP/Fib, +0.26; CRP/NeuSeg, +0.26; CRP/WBC, +0.24; CRP/Alb, -0.21; CRP/Band,

+0.14; CRP/Fe, -0.08; CRP/NeuTOX, +0.23; MonATT, +0.22. On the contrary, the MR analysis did not show any relationship between CRP and other markers ( $R^2$ : 0.05 for  $CRP \geq 0.30$  mg/dL; 0.02 for  $CRP \leq 0.29$  mg/dL). ROC analysis of the parameters yielded the following results: NeuSeg is a moderately accurate inflammation marker with Area Under the Curve (AUC) of 0.71. The other parameters are less accurate markers of inflammation (AUC) compared to CRP: WBC, 0.70; Fib, 0.67; Alb, 0.64; Fe, 0.64; Band, 0.59. The markers with the best combination of Sensitivity (SS) and Specificity (SP) were: Fib (SS, 52.7; SP, 77.5 for 400 mg/dL cut-off) and Band (SS, 17.6; SP, 98.0 for 0.3 K/ $\mu$ L cut-off). The correlation between CRP and all the parameters studied, except Linf REA, is significant but low because they are affected by many conditions aside from inflammation. None of them is able to predict CRP values. The diagnostic accuracy of each single inflammatory marker is lower in comparison to CRP. In order to increase the diagnostic accuracy of inflammation markers, an evaluation of several parameters simultaneously is warranted, particularly in the absence of CRP measurement.

- 1) Anziliero et al, Ci Anim Bras 14:265-272, 2013.
- 2) Ceron et al, Vet Clin Path 34:85-99, 2005.
- 3) Eckersall et al, JSAP 55:1-3, 2014.