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Values of haematological and blood biochemical parametres in pregnant or lactating beagle dogs

D.C. Orfanou\textsuperscript{a}, P.J. Cripps\textsuperscript{b}, L.V. Athanasiou\textsuperscript{a}, H.N. Ververidis\textsuperscript{c}, Z.S. Polizopoulou\textsuperscript{c}, C.M. Boscos\textsuperscript{c}, I.A. Taitzoglou\textsuperscript{c}, I.A. Fragkou\textsuperscript{c}, I. Valasi\textsuperscript{a}, G.C. Fthenakis\textsuperscript{a}

\textsuperscript{a}Veterinary Faculty, University of Thessaly, 43100 Karditsa, Greece, \textsuperscript{b}School of Veterinary Science, University of Liverpool, Neston, South Wirral, CH64 7TE, United Kingdom and \textsuperscript{c}Faculty of Veterinary Medicine, Aristotle University of Thessaloniki, 54124 Thessaloniki, Greece
gcf@vet.uth.gr

In female dogs, there are few references regarding values of haematological and blood biochemical parametres during the various reproductive stages; possibly, reference values, which have been validated from studies performed in non-pregnant / non-lactating animals, may not be always applicable in pregnant or lactating dogs. Objectives of this work were to study whether values of haematological and blood biochemical parametres in female dogs during pregnancy and the puerperium are within the established, reference ranges and to propose a range of reference values for dogs during pregnancy and the puerperium for parametres significantly affected by the reproductive status of the animal. In total, 12 healthy female Beagle dogs were included in the study. Regular samples were collected from the animals, starting on the 1st week of pregnancy until the 84th day of the lactation period, on following time-points: day [D] 58- day [D] 55, D49-D43, D36-D30, D25-D20, D15-D11, D9-D7 and D3-D1 before whelping and thereafter on the day of whelping, 1, 2, 4, 7, 10, 14, 21 days after whelping and at weekly intervals up to 84 days after whelping. The following parametres were studied in the blood samples: haematocrit, total leucocyte counts, thrombocyte counts, haemoglobin content, mean corpuscular haemoglobin content (all haematological parametres performed by means of an automated blood analyser), fibrinogen concentration (performed by means of Millar’s technique), differential leucocyte counts (performed by means of direct microscopy after Giemsa stain of blood films), total protein and albumin concentrations, alkaline phosphatase activity, glucose concentration, ionised calcium concentration (all these biochemical parametres performed by means of an automated blood biochemical analyser), globulin concentration (by deducting albumin concentration from total protein concentration), C-reactive protein content (by means of ELISA), total calcium and magnesium concentrations (by means of flame atomic absorption spectrophotometre). For analysis of the results, pregnancy was divided into three stages: P1 (first week after mating), P2 (subsequent 45 days), P3 (last week before whelping), and the puerperium into four stages: L1 (first week after whelping), L2 (second and third weeks after whelping), L3 (from 21st to 42nd day after whelping) and L4 (subsequently to the 42nd and up to 84th day after whelping). All animals whelped normally and did not show any clinical problems throughout the study. A significant effect of the peri-parturient period (last week of pregnancy [P3] and first week of the puerperium [L1]) was noted in the following parametres, rendering proposed reference range values during that period as follows: haematocrit 25.5-33.5%, total leucocyte counts 15,500-26,000 cells μL\textsuperscript{-1}, thrombocyte counts 568,500-823,000 cells μL\textsuperscript{-1}, haemoglobin content 8.0-10.0 g dL\textsuperscript{-1}, mature neutrophil counts 10,500-19,500 cells μL\textsuperscript{-1}, lymphocyte counts 2,700-6,000 cells μL\textsuperscript{-1}, total protein concentration 4.5-6.0 g dL\textsuperscript{-1}, albumin concentration 1.8-2.4 g dL\textsuperscript{-1}, C-reactive protein content 36.0-152.0 mg L\textsuperscript{-1}, total calcium concentration 8.8-10.0 mg dL\textsuperscript{-1}. In conclusion: the results indicate that, in female dogs, during last week of pregnancy and first week of lactation, use of established reference values for the above parametres may lead to incorrect conclusions; a different range of reference values for these parametres has been proposed and can be used when testing blood samples from female dogs in the above reproductive stages.