

BIOCHEMICAL CHANGES DURING PREGNANCY IN BITCHES

A. Vijayarajan¹, V. Vijayanand² and J. Rajasekaran³

Veterinary University Peripheral Hospital, TANUVAS,
Madhavaram Milk Colony, Chennai – 51.

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An early and reliable pregnancy diagnosis in the recent times ultrasonography are relied upon for early diagnosis of pregnancy in bitches. Hence the study was carried out to find out if there was any biochemical change during different stages of pregnancy in bitches.

Forty bitches of different breeds with known breeding history brought to the Small Animal Obstetrics and Gynaecology Unit, Madras Veterinary College Hospital were utilized for the study.

The gestation length of the bitch was divided into four different group as :

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|--|------------------------------|
| Group 1 (1st trimester) | : day 0 – 23 of pregnancy |
| Group 2 (first half of 2nd trimester) | : day 24 – 32 of pregnancy |
| Group 3 (second half of 2nd trimester) | : day 33 – 42 of pregnancy |
| Group 4 (3rd trimester) | : day 43 – term of pregnancy |

and the first day of mating was taken as day ' 0 ' of pregnancy as suggested by Toal *et al.* (1986). The forty bitches were examined once under these four groups as the owners were advised to bring their pet for a check-up during different stages of pregnancy.

Blood samples were collected from all the bitches under study at different stages and the following were estimated :

1. Part of M.V.Sc., thesis submitted to The Tamil Nadu Veterinary and Animal Sciences University, Chennai – 51. Assistant Professor, KVK, Kundrakudi, TANUVAS.

2. Corresponding author: Assistant Professor, Veterinary University Peripheral Hospital, TANUVAS, Madhavaram Milk Colony, Chennai – 51.

3. Retd. Professor & Head, Dept. of Obstetrics & Gynaecology, Madras Veterinary College, Chennai – 7.

contribute to better reproductive management in dog breeding. Abdominal palpation, radiography and
a) total plasma protein and albumin – Biuret and Dumas method (Varley, 1980).

b) serum alkaline phosphatase – King and King (1954).

c) acute phase protein analysis

i) plasma fibrogen – sodium sulphite precipitation method (Wooton, 1964).

ii) plasma protein : fibrinogen ratio – calculated using a formula (Jain, 1986).

PP : F = Plasma Protein — Fibrinogen / Fibrinogen

The data collected were statistically analyzed as per Snedecor and Cochran (1994).

The Mean ± S.E. values of various biochemical parameters of group 1,2,3 and 4 are given in Table 1. There was a decline in the plasma protein and albumin levels in group 1, 2 and 3 , while there was a significant increase in the level in group 4. No significant change in the serum alkaline phosphatase levels was observed during different stages of pregnancy.

With respect to fibrinogen level, it was at its peak during the 1st trimester of pregnancy and started declining as the days advanced (Table 1). Significant variation in plasma protein : fibrinogen ratio were observed between group 4 and other groups.

The decline in the plasma protein and albumin levels in the 1st and 2nd trimester of pregnancy, and thereafter a significant increase in

the 3rd trimester of pregnancy may be attributed to the rapid and active initiation of biosynthesis of proteins for fetal growth and survival (Dunlop and Dickson, 1955).

The increase in the fibrinogen level in the 1st trimester (0 – 23 days) of pregnancy may be due to a transitory intravascular coagulation leading to increased usage and extra formation of fibrinogen (Concannon *et al.*, 1996). The highest plasma protein : fibrinogen ratio observed in group 4 when compared to other groups may be attributed to the decreasing fibrinogen values in group 1,2, and 3.

Early pregnancy diagnosis in bitches can also be made based on the biochemical changes namely decreasing plasma protein and albumin levels in the 1st (0 – 23 days) and 2nd (24 – 42 days) trimester of pregnancy and elevated fibrinogen levels in the 1st and first half of 2nd trimester (24 - 32 days), in addition to abdominal palpation and ultrasonography.

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Concannon , P.W. *et al.* (1983). *Am. J. Vet. Res.*, **Table 1**

Values of biochemical parameters of non- pregnant bitch and of group 1, 2, 3 and 4 (Mean ± S. E.)

Parameter	Normal value of non-pregnant bitch	Mean ± S.E				F-value
		Group 1 0-23 days	Group 2 24-32 days	Group 3 33-42 days	Group 4 43 days -vaca	
Total Protein (g/dl)	61-78	6.01 ^a ± 0.19	5.92 ^a ± 0.11	5.97 ^a ± 0.10	6.94 ^b ± 0.12	15.23 ^{**}
Protein/Albumin (g/dl)	31-40	2.88 ^a ± 0.06	2.79 ^a ± 0.06	2.72 ^a ± 0.08	3.30 ^b ± 0.06	16.67 ^{**}
Serum/Albumin Ratio (S/A)	3-6	1.13 ^a ± 0.30	1.00 ^a ± 0.33	0.88 ^a ± 0.25	0.90 ^a ± 0.28	0.22 ^{NS}
Fibrinogen (mg/dl)	200-400	546.5 ^a ± 63.40	498.1 ^a ± 20.63	366.7 ^b ± 18.18	221.5 ^c ± 9.88	22.44 ^{**}
Protein: Fibrinogen Ratio	1.5-2.5	1.20 ^a ± 0.28	1.10 ^a ± 0.00	1.57 ^b ± 1.05	3.03 ^c ± 1.44	22.08 ^{**}

Means bearing the same superscript within the same row do not differ significantly

** Highly significant

NS Not significant