SERUM ACETYLCHOLINESTRASE (AChE) ACTIVITY AT DIFFERENT STAGES OF GESTATION IN TRIPLE CROSS CATTLE

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ABSTRACT

Serum Acetylcholinestrase (AChE) activity (mmol/ml/hr) was studied in triple cross pregnant heifers (20) and cows (24) at days 90, 150, 210 and 275 of gestation. AChE activity significantly ($P<0.01$) doubled at day 150 at day 90 in both heifers and cows. The activity further decreased significantly ($P<0.01$) on day 210 and day 275 of gestation in both heifers and cows. The values at day 275 in heifers and cows were found to be at par with the values on day 90 of gestation.

KEY WORDS: Acetylcholinestrase, Gestation, Triple Cross Cattle

INTRODUCTION

Acetylcholinestrase (AChE) enzyme is essential for the functioning of the central nervous system for muscular response. Low AChE activity was reported in pregnant heifers and cows, which then recovered after calving to its normal level (Slavic et al., 1976). Further studies have indicated that infertility in cow is accompanied by reduced acetylcholine metabolism indicating a depression of cholinergic processes (Saiko, 1978). The literature on AChE activity during gestation especially in cattle is very scanty necessitating the current study on AChE activity at different stages of gestation in triple cross cattle.

MATERIALS AND METHODS

Fourty four normal and healthy, triple crossbred (½ Kankarej X ¼ Jersey X ¼ Holstein Friesian) pregnant heifers (20) and cows (24) maintained under standard management practices at the Livestock Research Station, AAU, Anand were included in the present study. Blood was collected through jugular venipuncture by aseptic measure after morning milking, on days 90, 150, 210 and 275 of gestation. Clear serum was separated and stored at -20° C till further analyses. Serum AChE was estimated by method of Fishman and Green (1961). Statistical analyses were done using Unequal Completely Randomization Design (CRD) as per Snedecor and Cochran (1994).

RESULTS AND DISCUSSION

Maximum serum AChE activity was found at 150 days of gestation in both heifers and cows, then decreased significantly at 210 and 275 days of gestation and reaches to the values nearly equivalent to values of 90 days of gestation, however the decrease in activity in cows was non significant on day 210. No significant difference was recorded in AChE activity between heifers and cows on all the stages of gestation in this study (Table-1).

Table 1. Serum AChE (µmol/ml/hr) during different stages of gestation in triple crossbred cattle (Mean ± SE)

Animals	Stage of Gestation (days)			
	90	150	**210**	**275**
Heifers (20)	8.52a ± 0.50	18.50c ± 0.94	13.92^{b} ± 0.78	10.00^{a} ± 0.75
Cows(24)	7.83^{x} ± 1.38	18.64^{y} ± 1.00	15.36^{y} ± 0.96	9.70^{x} ± 0.55
Overall(44)	8.09^{i} ± 0.85	18.56^{k} ± 0.67	14.68^{j} ± 0.63	9.82^{i} ± 0.44

Mean with different superscripts within the row vary significantly (P<0.01) from each other.
Superscripts - a,b,c - Heifers, x,y - Cows and i,j,k - Overall

The probable reason for the increase in mid gestation and then subsequent decrease during the latter stages of gestation as recorded in this study may be due to the myometrial blocking effect induced by progesterone, haemodilution, altered hepatic function and anti-AChE activity of estrogen (Cole and Cupps, 1997). Similarly Ingole et al. (1999) found that serum AChE activity differed significantly between the phases of gestation in Gir and crossbred cows. They observed a decreasing trend from oestrus to late pregnancy in Gir cows, whereas in crossbred cows they noted a slight increase during mid gestation. Srivastava et al. (2001) reported that pregnancy rate in cows was high when AChE activity was high and low when AChE activity was low.

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