

ACTIVITY OF ADENOSINE DEAMINASE AND ITS ISOENZYMES IN SERUM OF PREGNANT BUFFALOES

S. M. CHAUDHRY, Z. NASEER, S. RABBANI¹ AND S. A. ALROKAYAN

Animal Sciences Institute, National Agricultural Research Centre, Islamabad;

¹Department of Animal Nutrition, NWFP Agriculture University, Peshawar, Pakistan

Adenosine deaminase (ADA), an enzyme involved in purine catabolism, exists in two main isoenzymes forms, ADA₁ and ADA₂ which have different optimal pH, Michael's constant and relative substrate specificity. Monocyte macrophages produce and release ADA₂ when they are stimulated by infection (Gakis *et al.*, 1995; Alrokayan, 2002) or when immunity is altered (Gakis, 1996).

Pregnancy is associated with depressed cell mediated immunity (Gakis, 1996). Blood samples were obtained 6 hours post feeding from jugular vein of 66 pregnant and 13 non pregnant buffaloes. Serum was separated and used for the measurement of concentrations of ADA, ADA₁ and ADA₂. Activity of the ADA enzyme was measured spectrophotometrically using the method of Giusti and Galanti (1984), which is based on direct measurements of the ammonia produced when ADA acts in excess of adenosine. To distinguish ADA₁ from ADA₂, the activity was measured using the same techniques with erthyro-9(2hydroxy3-nonyl) adenine. Erthyro-9(2hydroxy3-nonyl) adenine is a potent inhibitor of only ADA₁ isoenzyme (Gakis, 1996), showing the ADA₂ activity. The activity of ADA₁ was then calculated by subtracting the ADA₂ activity from total ADA activity.

Mean values (\pm SE) were computed for activities of ADA, ADA₁ and ADA₂ for pregnant and non pregnant buffaloes. Student's T test was applied to ascertain the magnitude of difference in these activities between the two groups.

Decreased ($P < 0.05$) values of total serum ADA activity in the pregnant (all three trimesters) buffaloes compared to the non pregnant control group were recorded (Table 1). When the activities of isoenzymes

were considered, ADA₂ activity was lower ($p < 0.05$) in pregnant than in non pregnant buffaloes. These results are supported by the findings of earlier workers, who suggested that ADA₂ is involved in cellular immunity of human (Gakis, 1996). However, the ADA₁ activity did not differ between the pregnant and non pregnant buffaloes. Similarly, the activities of total ADA, ADA₁ and ADA₂ did not differ among pregnant buffaloes of three trimesters. Similar results have reported in human by Martinez-Herndndez *et al.* (1990). It is concluded that reduced serum total ADA activity reflects decrease in ADA₂ activity, which may be in part associated with depressed cell-mediated immunity during pregnancy.

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Table 1: Concentrations of ADA, ADA₁ and ADA₂ in serum of control and pregnant buffaloes^a

Item	Number of animals	ADH activity (units/ml)		
		Total ADA ^b	ADA ₁	ADA ₂ ^b
Groups				
Control	13	19.15 \pm 1.2	5.15 \pm 1.2	14.01 \pm 1.4
Pregnancy				
1st trimester	33	12.66 \pm 1.3	5.14 \pm 1.2	7.52 \pm 1.8
2nd trimester	20	12.35 \pm 1.7	5.22 \pm 1.2	7.13 \pm 1.7
3rd trimester	13	12.78 \pm 1.6	5.28 \pm 1.4	7.50 \pm 1.7

^aEach assay was run in triplicate.

^bValues of control group are significantly different from pregnancy group of each trimester ($P < 0.05$).