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Short Communication

Effect of stress during different durations of dystocia on various blood indices in buffaloes

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ABSTRACT

Thirty three dystocia affected buffaloes were divided into four groups with labour pains less than 12 hours (group A; n = 07), 12-24 hours (group B; n = 12), 24-36 hours (group C; n = 06) and more than 36 hours (group D; n = 08) to assess the degree of sress with relation to different duration of dystocia. Plasma cortisol concentrations (3.24-30.77 µg/dl) increased with duration of onset of labour pains. Histamine concentration, total leukocytic count and neutrophils increased significantly ($P < 0.01$) from initial values of 460.08 µmol/l, 6.74x 10^3/cumm and 55.14 per cent, respectively, in group A to 602.14 µmol/l, 9.90 x 10^3 cumm and 59.87 per cent, respectively, in group D. Lymphocytes (36.62%) were non-significantly lower in group D as compared to other groups. It is thus, concluded that increased concentrations of cortisol and histamine with alterations in otal leukocytic, neutrophilic and lymphocytic counts indicated higher degree of stress in protracted cases of dystocia.

Key words : Buffalo, cortisol, dystocia, histamine, stress

Normal parturition is a stressful event characterized by an increase in the circulatory levels of glucocorticoids. Dystocia, the difficult parturition is even more stressful as indicated by much higher cortisol concentrations over normal calving controls (Prabhakar *et al.*, 1999). The abnormal rise in cortisol level may adversely affect reproduction, immune system, body metabolism and may even lead to death of the affected animal due to adrenal exhaustion (Kelly, 1980). Mortality rate remains more than 70 per cent in buffaloes with longer duration of dystocia (Verma *et al.*, 1974). Therefore, the present study was conducted to assess the degree of stress and its effect on different blood parameters in buffaloes with different durations of dystocia.

Thirty three dystocia affected buffaloes presented for treatment at the Veterinary Clinics, Punjab Agricultural University, Ludhiana were divided into four groups with labour pains for less than 12 hours (group A; n = 07), 12-24 hours (group B; n = 12), 24-36 hours (group C; n = 06) and more than 36 hours (group D; n = 08). Following anamnesis and thorough clinical examination, blood samples were collected through jugular venipuncture. One aliquot was used for haematology and histamine estimations while from the rest of blood sample, plasma was harvested and stored at -20°C for cortisol estimations. Plasma cortisol was estimated by Radio Immuno Assay technique using diagnostic kits procured from DiaSorin, USA. Blood histamine was estimated as per the method described by Klimkina and Plitman (1989). Total leukocytic count (TLC) and differential leukocytic count (DLC) were estimated as per the method described by Schalm *et al.* (1975). Data in respect of various parameters was subjected to student's t-test (unpaired test) for statistical analysis (Singh *et al.*, 1991).

The results of various parameters studied are presented in the table. It is evident that as the duration of dystocia prolonged, plasma cortisol concentrations remained non-significantly higher as compared to fresh cases of dystocia, indicating higher degree of stress prevalent in these animals. Plasma cortisol is a sensitive indicator of stress reaction that reflects the degree of stress an individual is being afflicted with. The dystocia affected buffaloes have significantly higher initial cortisol concentrations which persist in animals that die subsequently following obstetrical manipulations (Prabhakar *et al.*, 2002). This indicates cortisol estimation as a good prognostic indicator in buffaloes with

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dystocia. Blood histamine concentrations in cases presented within 12 hours of occurrence of dystocia (group A) enhanced significantly ($P < 0.01$) and in animals presented after 36 hours, the blood histamine concentration was 602.12 µmol/L, indicating severe tissue damage. Enhanced release of catecholamines during stress leads to release of histamine from mast cells (Matharu and Prabhakar, 1999). Moreover, ischaemic and necrotic changes in uterine tissue due to hypoxia might had caused increased release of histamine from damaged tissue (Matharu, 1997). Besides, hypocalcaemia and subclinical ketosis might be other reasons for higher histamine concentrations in delayed cases (Gupta *et al.*, 1995).

TLC and neutrophils linearly increased whereas lymphocytes decreased as the dystocia became protracted, suggesting higher stress and inflammatory changes in the protracted cases of dystocia (Manju *et al.*, 1985; Verma *et al.*, 1988; Singh, 1991). Higher adrenal stimulation due to stress of dystocia might cause increased release of neutrophils from the bone marrow and mobilization of marginated neutrophils into circulation.

Increased cortisol and histamine concentrations and alterations in TLC and DLC were indicative of higher degree of stress in delayed cases of dystocia over 24 hours duration. It thus appears that dystocia is a highly stressful situation which warrants immediate expert handling to ensure dam survivability.

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