

Blood serum levels of inorganic elements in mehsani buffaloes retaining fetal membranes

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ABSTRACT

Serum calcium, inorganic phosphorus and magnesium levels were 10.59 ± 0.55 , 9.31 ± 0.28 and 9.28 ± 0.43 mg, 4.86 ± 0.29 , 4.70 ± 0.22 and 4.11 ± 0.43 mg and 3.84 ± 0.23 , 3.44 ± 0.20 and 3.81 ± 0.28 mg per 100 ml in the Group-I, Group-II and Group-III, respectively. Lower levels were observed for these elements in the groups of buffaloes retaining fetal membranes as compared to control, but the differences were statistically nonsignificant.

Key words : Inorganic elements, retaining fetal membranes, mehsani buffaloes

Retention of fetal membrane is a common post partum and post abortion complication. The biochemical aspects of etiology and pathogenesis of retained fetal membrane is in completely understood and hence the present study was under taken to study the levels of inorganic elements in the affected and control buffaloes.

MATERIALS AND METHODS

The study was under taken on Mehsani buffaloes of Mehsana district, Gujarat. Buffaloes were grouped in three different groups viz., Group - I: 10 buffaloes not retaining fetal membranes after normal parturition (WRFM or Control), Group - II: 25 buffaloes retaining fetal membranes after parturition (RFM/AP) and Group- III: 11 buffaloes retaining fetal membranes after abortion (RFM/AA). The animal was considered to retain fetal membranes when placenta was not expelled within 12 hours after parturition or abortion. Blood was collected prior to treatment in both the RFM groups and after the placental expulsion in the control group. Serum calcium was estimated according to the method of Webster (1962). Serum phosphorus was estimated as per Gomorri's method using diagnostic reagent kit (Span Diagnostics Ltd., Udhna, Surat) and serum magnesium was

estimated using titan yellow method as described by Oser (1971). The data were statistically analyzed as per the Snedecor and Cochran (1980)

RESULTS AND DISCUSSION

The mean serum calcium was observed to be 10.59 ± 0.55 , 9.31 ± 0.28 and 9.28 ± 0.43 mg per 100 ml of serum in the Group-I, Group-II and Group-III, respectively (Table 1). The difference was non-significant between the groups. However, control group had comparatively higher concentration of serum calcium which suggested that the low calcium concentration may be responsible to some extent for the causation of RFM. Low levels of calcium influence the tonicity of uterus (Arthur, 1989).

The mean serum phosphorus was observed to be 4.86 ± 0.29 , 4.70 ± 0.22 and 4.11 ± 0.43 mg per 100 ml of serum in the Group-I, Group-II and Group-III, respectively. The difference was nonsignificant among the groups. It has been reported that reduction in blood glucose in cows with retained placenta may be due to its increased metabolism which involves inorganic phosphorus. The low serum phosphorus in the RFM group may be explained on the basis of observation that RFM is accompanied by reduction in blood glucose (Dutta, 1980). In the present study also blood glucose was lower along with serum phosphorus level for the buffaloes of RFM groups. Ca: P ratio was found to be 2.18 ± 0.16 , 1.98 ± 0.13 and 2.26 ± 0.26 in the

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Table 1 Average (Mean $\pm$ S.E) serum calcium, phosphorus and magnesium in different groups.

PARAMETER	GROUPS		
	WRFM (n=10)	RFM/AP (n=25)	RFM/AA (n=11)
Calcium	10.59 $\pm$ 0.55 (7.61-12.61)	9.31 $\pm$ 0.28 (6.74-11.96)	9.28 $\pm$ 0.43 (7.17-11.30)
Phosphorus	4.86 $\pm$ 0.29 (3.00-6.00)	4.70 $\pm$ 0.22 (2.70-6.40)	4.11 $\pm$ 0.43 (3.00-6.40)
Ca:P	2.18 $\pm$ 0.16	1.98 $\pm$ 0.13	2.26 $\pm$ 0.26
Magnesium	3.84 $\pm$ 0.23 (2.69-4.79)	3.44 $\pm$ 0.20 (2.08-5.35)	3.81 $\pm$ 0.28 (1.74-5.07)

n=number of buffaloes in different groups.

Figures in the parenthesis indicate range.

Group -I, Group-II and Group-III, respectively. The difference was non-significant between the groups. In the present study this ratio has been observed to be lower for the RFM/AP which is in agreement with the findings of Pathak *et al.* (1991). Minerals are important in the prevention of RFM (Wilde, 2006). Imbalance of calcium and phosphorus metabolism was correlated positively with RFM in cows (Zhang *et al.*, 1992) and in buffaloes (El-Hanafy, 1998, Amjad Ali, 2008).

The mean serum magnesium was observed to be 3.84 $\pm$ 0.23, 3.44 $\pm$ 0.20 and 3.81 $\pm$ 0.28 mg per 100 ml in the Group - I, Group-II and Group-III, respectively. Average values were found to be lower for both the RFM groups as compared to control group, but the difference was nonsignificant. These findings corroborated well with the Amjad Ali (2008) who observed the lower levels of magnesium in the buffaloes affected with retention of fetal membranes in different agro ecological zones. Krupnik and Marsinkowski (1983) who reported that sub clinical hypomagnesaemia and low levels of magnesium had an effect on placental retention in the cows.

As observed in the present study, the lower levels of all these inorganic elements have also been reported in cows with RFM (Bari *et al.*, 1996; Sabry *et al.*, 1997; Akar and Yeldiz, 2005; Tillard *et al.*, 2008).

CONCLUSION

In the view of the findings of the present study it is concluded that the lower levels of calcium, phosphorus and magnesium have an important role to play in retaining the after birth.

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