LACTATE DEHYDROGENASE PROFILE IN FEMALE BUFFALO CALVES FROM BIRTH TO PUBERTY

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SUMMARY

Forty two female Murrah buffalo calves of various age groups were used to study for correlating peripheral concentrations of lactate dehydrogenase (LDH) with various developmental stages from birth to puberty. The calves were evenly distributed into 7 groups (6 in each) depending upon their age, viz. 1-3 day old (neonatal calves), 4-30 days (perinatal calves), 3-6 months (young calves), 7-12 months (growing calves), 18-24 months (prepubertal heifers), 25-30 months (peripubertal heifers) and 31-36 months (pubertal heifers). The results revealed non existence of age associated variation in peripheral concentration of LDH except significantly lower values in perinatal calves as compared to other physiological stages.

Key words: Lactate dehydrogenase, buffalo calves

The activity of lactate dehydrogenase (LDH) is of clinical interest in diagnosis and prognosis of diseases (Deger \textit{et al.}, 2002). The serum enzyme levels obtained in clinical cases are required to be contrasted with the normal values of corresponding age groups. Therefore, it is very important to establish normal level of LDH in particular breed of animal at different developmental stages, since age of animal also affects the peripheral concentration of the enzymes. Some work on this aspect has been done in camel (Kataria and Bhatia, 1991) and cattle (Puri, 1998). The present study describes serum levels of LDH in female buffaloes of different age groups, which may serve as reference tools for clinicians.

Forty two female Murrah buffalo calves of various age groups maintained at the Central Institute for Research on Buffaloes (CIRB), Hisar, were evenly divided into 7 groups, viz. 1-3 and 4-30 days, and 3-6, 7-12, 18-24, 25-30 and 31-36 months constituting as neonatal calves, perinatal calves, young calves, growing calves, prepubertal heifers, peripubertal heifers and pubertal heifers, respectively. The peripubertal heifers were kept under vigilance for expression of oestrus behaviour and those buffaloes showing signs of first oestrus were grouped as pubertal heifers. The LDH levels were determined by using single step reagent kit using semi-autobiochemical analyzer.

The mean values along with the standard error in respect of serum enzyme LDH have been presented in Table 1. The peripheral concentration of serum LDH observed in female buffalo calves in the present study is higher as compared to the values reported in goat (Chiofalo, \textit{et al.}, 1985, Visha, \textit{et al.}, 2002), camel (Kataria and Bhatia, 1991, Khadjesh, 2002), buffalo (Jindal and Rattan, 1992), cattle (Sharma and Biso, 1995, Puri, 1998) and pig (Prasad and Kumar, 2002).

The data revealed that various values did

\begin{table}[h]
\centering
\begin{tabular}{|c|c|c|}
\hline
Age group & Stage & LDH (IU/L) \\
\hline
1-3 D & Neonatal calves & 1100.76 ± 105.42\textsuperscript{a} \\
4-30 D & Perinatal calves & 0836.20 ±16.15\textsuperscript{b} \\
3-6 M & Young calves & 1060.11 ± 38.80\textsuperscript{c} \\
7-12 M & Growing calves & 1143.83 ± 30.27\textsuperscript{d} \\
18-24 M & Prepubertal heifers & 1060.23 ± 65.17\textsuperscript{e} \\
25-30 M & Peripubertal heifers & 1112.55 ± 56.57\textsuperscript{f} \\
31-36 M & Pubertal heifers & 1071.76 ± 70.13\textsuperscript{g} \\
\hline
\end{tabular}
\caption{Serum enzyme lactate dehydrogenase (LDH) concentration (IU/L) during various developmental stages from birth to puberty in female buffaloes (mean ± S.E.)}
\end{table}

Values with the common superscripts do not differ significantly, D - days, M - months.

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not differ among themselves except the values obtained in perinatal calves of 4-30 days of age was significantly lower as compared to concentration observed in remaining intervals. The declining trend in peripheral concentration of LDH immediately after birth in female buffalo calves observed in the present study is in accordance with the reported decline in serum LDH activity after birth in pig and sheep (Sharon et al., 1982), cattle (Sharma and Bisoi, 1995, Puri, 1998) and camel (Kataria and Bhatia, 1991). However, contrary to our findings, a positive age associated trend in serum LDH activity was reported in cattle (Bogins et al., 1978), whereas no variation in peripheral concentration was found with advancement of age in farm animals (Castro et al., 1977, Behera et al., 1993). Recently, Atak et al., (2000) also failed to establish any clear-cut relationship between serum LDH values and advancing age of both Gir and crossbred calves.

The glycolytic pathway is more developed in newly born ruminants (Phillipsen, 1970, Swenson and Reece, 1996) to metabolize higher blood glucose as the only source of energy in neonates (Sharma, 1996, Puri, 1998). Therefore, the higher peripheral concentration of serum LDH immediately after birth recorded in female buffalo calves in the present study could be ascribed to higher glycolytic activity during this period and subsequent decline may be due to the fact that glycolytic breakdown of glucose does not remain the only source of energy for ruminants.

REFERENCES


