

A NOTE ON LYSOZYME ACTIVITY IN THE MILK OF DROMEDARIES DURING EARLY LACTATION PERIOD

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Milk contains a large number of specific and non-specific immunological factors aimed at the protection of the newborn. Among the non-specific immunoprotective factors, lysozyme an extraordinary bacteriolytic protein is a component of the antibacterial system, which also affects the general immune system. Latvietis *et al* (1995) have reported that addition of a lysozyme containing preparation of avian food significantly enhanced the T- and B- lymphocytes, circulating immune factors and lysozyme in serum along with daily growth. To date there is no literature available on lysozyme activity in camel's milk during early postpartal period. Hence, this study was undertaken to elucidate the course of lysozyme activity in camel milk during early lactation period. In addition, the influences of different physiological factors like parity and age of she camel and sex of newborn on lysozyme activity during early lactation period were determined.

Materials and Methods

This study was conducted on 29 female dromedaries, aged from 5 to 14 years. Total contingent was comprised of 11 primiparous and 18 multiparous dromedaries. Two age-groups consisted of 14 young (<10years) and 9 old (>10years) female dromedaries.

A total of 812 samples of milk amounting 10 ml each were collected in PVC tubes on alternate days during first 60 days following parturition. The samples were frozen immediately after milking and stored at -20 °C until analysis. Lysozyme activity in the milk was determined by a modified turbidimetric method using *Micrococcus lysodeikticus* as substrate. The averages of coefficient of variance (CV) for inter and intraassay amounted 3.59 and 3.65%, respectively.

The data were expressed as Mean \pm S.D. The differences between mean values of different groups were worked out with covariance analyses.

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All computations were performed with the help of statistical computer software SAS (SAS Institution Inc. Cary, NC, USA).

Results and Discussion

Lysozyme activities (LZA) in all 812 samples ranged between 2936 and 7365 U/ml with an average of 4542 ± 1760 U/ml during the period from 6th to 60th day postpartum. All dromedaries exhibited a marked decline on the 11th day postpartum. Following decline, the activities followed an almost linear trend until the end of study.

Multiparous, old (>10years) and those dromedaries which received male calves exhibited significantly ($P<0.05$) higher mean values than their primiparous and young (5-9 years) counterparts up to the marked decline on 11th to 13th day postpartum.

No literature is available on lysozyme activity in dromedary's milk to discuss these results. In human beings various authors had reported a range between 9880 to 52000 IU/ml, with an exception of Sanches-Pozo *et al* (1987), who recorded an enormously higher mean value (235300 IU/ml) in human milk. It was noted that the average lysozyme activity in dromedary's milk was substantially lower than that reported in human beings (McCelland *et al*, 1978; Hennart *et al*, 1991) and equines (Jauregui-Adell, 1974; Sarwar *et al*, 1996; Sarwar and Enbergs, 2000) but closer to the bovine species (Radwan and Elmarimi, 1987; Farid *et al*, 1989; Ismail *et al*, 1984).

Lysozyme activity in bovine milk has been extensively studied both in physiological and pathological conditions. There is a common agreement that bovine milk contains a very low concentration of lysozyme (0-58.5 mg/ml = 7605 U/ml). It has been justified by the fact that lysozyme is liberated from the broken up neutrophils in serum and bovine neutrophils contain extremely low concentration of lysozyme.

The findings of a strong decline on the 11th day postpartum are in good agreement with previous literature. Sarwar *et al* (1996) described a strong decline (20-25%) on 12th and 9th day postpartum in mare's milk, respectively. Sanches-Pozo *et al* (1987) carried out their investigations from 6th day postpartum and recorded a decline in lysozyme activity on 12th day postpartum. Following decline, the values, however, maintained a constant level until the end of study (30th day postpartum). McCelland *et al* (1978) and Hennart *et al* (1991) studied the daily changes in lysozyme activity in human milk during first week of lactation. They observed a strong fall during first 3-4 days of lactation, and thereafter, the values remained at a constant level throughout the week.

Abrupt ejection from the infection protected milieu of uterus to extra-uterine environment exposes new-born to a great infectious challenge. At the time of birth, newborn has not optimally developed immune system particularly in regard of secretary immunity. So new-born needs specific and non-specific immune factors through maternal milk. Comparatively high values of lysozyme activity in mare's milk can, above all, be considered as a protective factor for the newborn.

Elevated lysozyme activities during early postpartal period in relation to parity and age can be attributed to augmented training of specific and non-specific immune mechanisms with time. These results extend over to the previous literature (Sarwar *et al*, 1996). Senft *et al* (1974) and Götze *et al* (1977) have also reported higher lysozyme activities in multiparous cows as compared with their primiparous counterparts.

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