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SHORT COMMUNICATION

Evaluation of cold shock resistant spermatozoa of buffalo bull through polyacrylamide gel migration

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ABSTRACT

The initial motility, live percentage in normal spermatozoa decreased due to cold shock. The cold shock treatment affected adversely the penetrability of spermatozoa through polyacrylamide gel column.

Key words : Buffalo spermatozoa, PAGE, cold shock

Spermatozoa of many animals, including buffalo bull undergo irreversible changes on sudden exposure to a low temperature commonly referred, as cold shock. A permanent loss of sperm motility and metabolic activity occurs during the process of rapid cooling due to disruption of acrosomal and plasma membranes and leakage of enzymes (Harrison and White, 1972; White, 1993). An attempt was made to assess the penetrability of the cold shock survived spermatozoa through polyacrylamide gel migration.

For the study 20 ejaculates (5 each from 4 buffalo bulls) were extended in Tris-egg-yolk extender and divided in 2 aliquots, A and B. Aliquot A (control) was kept at room temperature and Aliquot B was exposed to low temperature i.e. at 0°C for 10 min. Both semen samples were examined for initial sperm motility, normal sperm count, live sperm count along with sperm migration through polyacrylamide gel column (PAG) as described by Lorton *et al.* (1981).

The seminal characteristics and spermatozoal penetrability through PAG column before and after cold shock revealed significant ($P < 0.05$) decrease in the initial sperm motility, live sperm count and normal sperm count decreased (67.75±1.08 vs 36.00±0.64, 80.20±1.09 vs 44.00±0.73, 84.20±0.51 vs 70.30±0.57%) when extended sperm were exposed to cold shock. The results are in accordance with the Chinnaiya and Ganguli (1978), Mohan *et al.* (1992) and Vaisburg *et al.* (1994). The rapid cooling also increased ($P < 0.01$) the occurrence of tail abnormalities give values-pooled after cold shock.

The average distance travelled by vanguard spermatozoa in PAG filled capillary tubes before and after cold shock was 21.61±0.29 and 16.45±0.11 mm/20 min, respectively which differed significantly ($P < 0.05$). The drop in spermatozoa penetrability through PAG might be due to partial loss of sperm motility and metabolic activity by disrupting acrosomal and plasma membranes, consequently resulting in leakage of enzymes. Mohan *et al.* (1992) recorded a significant decrease of motile spermatozoa, increased abnormal sperm count and angiotensin converting enzyme (ACE) activity from the sperm cells of buffalo bulls after cold shock. It could be inferred that the cold shock treatment affect the penetrability of buffalo spermatozoa.

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