Journal of Andrology, Vol 22, Issue 5 863-877, Copyright © 2001 by The American Society of Andrology

JOURNAL ARTICLE

Effect of scrotal insulation on clusterin-positive cells in ram semen and their relationship to semen quality

N. M. Ibrahim, J. E. Romano, M. H. Troedsson and B. G. Crabo
Department of Clinical and Population Sciences, University of Minnesota, St Paul 55108, USA.

Scrotal contents of 2 rams were insulated for 96 hours and the fraction (as a percentage) of clusterin-positive cells (CPCs) and its relationship to semen quality was investigated. Semen collection was started 18 days before insulation and was terminated on day 78 and day 63 after insulation in animals 1 and 2, respectively. Sperm clusterin was localized by immunostaining with anti-bovine clusterin antibody (anti-bCAb) and fluorescein isothiocyanate-conjugated immunoglobulin G. Scrotal insulation led to deterioration of semen quality and increased the percentage of CPCs in both rams. Two types of sperm reactivity were observed: an extensive, intensive staining pattern (ESP); and a localized, less-intensive staining pattern (LSP). The percentage of ESP-CPCs began to increase from day 6 and reached 88.8% and 100% on day 15 after insulation in animals 1 and 2, respectively. The increase in CPCs coincided with the presence of a high percentage of teratoid forms (88.3%) in semen from animal 1, and detached heads (81.4%) in semen from animal 2. After normal semen production was restored on day 60 in animal 1, the percentages of ESP-CPCs and LSP-CPCs returned to preinsulation rates, whereas only the ESP-CPCs returned to normal in animal 2. A negative relationship was observed between ESP-CPCs and total sperm/ejaculate (r = -.62), motility (r = -.78), viability (r = -.68), and filtration rate (r = -.71) in semen from animal 1. Conversely, a positive relationship was seen between ESP-CPCs and total abnormal spermatozoa (r = .82). Similar results were obtained in semen from animal 2. CPCs were nearly completely absent in glass wool-Sephadex (GWS)-filtered semen, suggesting a role for clusterin in the process of trapping abnormal spermatozoa in the GWS filters. We conclude that aberrant spermatogenesis induced by scrotal insulation increases the percentage of CPCs in ram semen. We suggest that the percentage of CPCs in ram semen could be a useful marker in poor-quality ejaculates.