Correlation between sperm DNA fragmentation index and CMA3 positive spermatozoa in globozoospermic men

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Content: The absence of the acrosome causes the situation which is called globozoospermia. Objective: To study correlation between levels of sperm DNA damage in patients with total round-headed spermatozoa.

Methods: Semen samples divided into three parts to semen analysis, to measure DNA fragmentation index (DFI) using sperm chromatin structure assay (SCSA) and to detect CMA3+ sperm cells by chromomycin A3 staining and fluorescent microscopy.

Patients: 20 globozoospermic men (with more than 90% round-headed sperm) and 40 normozoospermic men attending to Royan Institute.

Interventions: There is no intervention in this study.

Main outcome measures: We compared mean of quantitative variables such as DFI, CMA3 and sperm parameters between two groups.

Results: Our results showed that there were significant differences in sperm concentration, total sperm motility and normal morphology between patients and controls group (p<0.001). Moreover, the average of DFI and CMA3 positive spermatozoa in patients group significantly increases compared with control group (p<0.001). A significant correlation between DFI and CMA3+ in total population was also detected in patients group (r = 0.45, p = 0.046).

Conclusions: To our knowledge, this is the largest study about correlation between DNA damage levels and CMA3 positive spermatozoa with round head sperm cells in total globozoospermic men. It seems that the increase of DNA damage may be due to defective sperm DNA compaction, as we detected CMA3 positive sperm cells in these patients.

Keywords: round head, spermatozoa, DNA damage, CMA3, protamines