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TITLE

EFFECT OF SPERM PROCESSING BY DENSITY GRADIENT CENTRIFUGATION ON SPERM MEMBRANE INTEGRITY

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ABSTRACT

Context: Sperm selection during Intracytoplasmic sperm injection (ICSI) is a challenging task considering the limits of current procedures based on visual morphological selection. Recently, the Hypo-Osmotic Swelling Test (HOST) was proposed as a tool for sperm selection based on the tail-swelling grade, which reflects the integrity of sperm membrane.

Objective: The objective of this study was to evaluate the effect of semen processing by density gradient centrifugation (DGC) on sperm membrane integrity as assessed by HOST.

Patients and Interventions: Semen samples were collected from ten men attending our center for couple infertility investigation. Routine semen parameters, sperm chromatin status (modified Diff-Quik staining) and HOST-induced tail-swelling grades (“a” to “g”) were assessed for each sample before and after processing by DGC.

Main Outcome Measures and Results: The distribution of HOST categories revealed that grades “g”, “a” and “b” were most common in total sperm population, with an average of 39% vs 36%, 23% vs 18% and 18% vs 23%, respectively before and after DGC ($p>0.05$). Before DGC, grade “d” was positively correlated with sperm count ($p=0.002$) and with improved chromatin packing ($p=0.03$). After selection, grade “d” was correlated with improved sperm count ($p=0.04$) and chromatin packing ($p=0.01$), grade “b” with improved sperm vitality ($p=0.02$) and morphology ($p=0.02$), and grade “c” with improved sperm count ($p=0.03$).

Conclusions: Our study shows that HOST grades “d” and “b” were most associated with improved sperm parameters. Semen preparation by DGC allowed us to increase the proportion of spermatozoa with HOST grades that are associated with better sperm quality, which could facilitate their retrieval during ICSI sperm selection procedures.

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