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Physiological and biochemical assessment of a new semen collection device

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OBJECTIVE

Semen quality is a key factor in determining the outcome of most infertility treatments. Previously, this lab has demonstrated that a modification of the collection container; known as the device for improved semen collection (DISC), resulted in significant improvement in semen quality. Studies in two animal species suggested not only improved semen parameters but increased pregnancy rates as well. The objective of the present study was to assess the effectiveness of a clinical-grade version of the DISC on sperm cell function and biochemistry prior to clinical trials.

DESIGN

A laboratory based controlled trial.

MATERIALS AND METHODS

Nine donors supplied three samples each collected in a standard specimen cup (SSC), the DISC or the DISC with 1 mL of media. Following collection, each sample was processed using a simple sperm washing technique and then placed in culture for 24 h. At predetermined intervals, aliquots were taken for standard semen analysis using an IVOS, and biochemical assessment including, intactness of acrosomal membranes, lipid peroxidation level, mitochondrial membrane potential and DNA Fragmentation. Resulting data were subjected to ANOVA with repeated measures.

RESULTS

All parameters from semen collected in the DISC were either equivalent or superior to semen collected in the SSC. Specifically, samples collected in the DISC and/or DISC+ had higher rates of cell viaibility ($P < .005$), progressive velocity ($P < .05$) and motility index ($P < .034$) compared to the SSC, and trended toward higher motility rates ($P=.066$) and path velocities ($P=.061$). Further, cells collected in the DISC had more intact acrosomes ($P<.017$), and retained higher mitochondrial membrane potential ($P<.004$) over the 24 period compared to the SSC.

CONCLUSION

Semen collected in the clinical-grade DISC appears to have superior physiological activity

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and biochemical stability when compared to a SSC. Clinical trials are on-going to assess the usefulness of the DISC in the clinical environment.

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