RECOVERY AND SURVIVAL OF SPERM IS HIGHER WITH PURESPERM DENSITY GRADIENT THAN SWIM-UP IN NEAT AND CRYOPRESERVED-THAWED SEMEN SPECIMENS
Pavithra Ranganathan, Ashok Agarwal, The Cleveland Clinic Foundation

Objective:
Successful assisted reproduction requires sperm processing methods yielding highly motile sperm that can sustain their motility for long periods for fertilization. Our study compared the efficacy of the density gradient method using Purepseperm with the traditional swim-up method. The main objectives were to 1) evaluate the motility, longevity, and recovery rates of sperm processed with Purepseperm and by the swim-up methods, 2) compare the post-thaw sperm count, motility, recovery rates and longevity between the two methods, and 3) compare sperm characteristics in asthenospermic specimens prepared by the two methods.

Design:
Prospective study in a male infertility clinic using semen specimens.

Materials/Methods:
Specimens from 9 individuals coming to our infertility laboratory were analyzed for sperm characteristics. Each sample was divided into two aliquots and each processed by either Purepseperm density gradient (40%-80% gradients and wash media, Nidacon International, Gothenburg, Sweden) or swim-up using modified human tubal fluid medium (Sage BioPharma, Bedminster, NJ). The two fractions were analyzed for sperm count, motility, percent recovery and longevity (1 and 4 h) and cryopreserved by a standard freezing procedure using TEST yolk buffer as the freezing medium. Post-thaw analysis was done after 24 h to evaluate recovery rates, total motile sperm counts and longevity (1 and 4 h).

Results:
Sperm characteristics of specimens processed by Purepseperm density gradient and swim-up are shown in the table below. Asthenospermic specimens (n = 4) prepared with Purepseperm had higher total motile sperm counts (15.4 X 10⁶ vs. 9.7 X 10⁶; p = 0.07), recovery (66.2% vs .47%, p = 0.014), and longevity at 4 h (61.2% vs. 31.5%; p = 0.0004) than swim-up method. Post thaw specimens also had better survival (13.7% vs. 3.1%) with Purepseperm compared to swim-up. There was an inverse correlation between specimen age after sperm processing and motility (r = -0.73, p = 0.02).

Conclusions:
We report significantly higher recovery of total motile sperm and longevity in fresh semen specimens prepared with Purepseperm density gradient, as well as specimens cryopreserved after Purepseperm density gradient, compared to swim-up method. In addition, Purepseperm provides significantly higher recovery of total motile sperm in asthenospermic specimens. The better longevity of spermatozoa prepared by Purepseperm appears to be due to short processing time (35 to 40 min) of density gradient method as compared to swim-up technique (90 min). We recommend the use of Purepseperm density gradient in sperm preparation for assisted reproduction.

Supported by:
A grant from the Cleveland Clinic Foundation.
Values are median and interquartile (25%, 75%). *P <0.05 was significant by two tailed Student's t-test. †TMS - total motile sperm count.