

Higher rates of recovery with Puresperm density gradient compared to ISolate

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Introduction: The ideal semen processing technique should result in the selective recovery of good quality motile sperm while maintaining a high total yield of recovered sperm. It has been demonstrated that the use of density gradient media for the isolation of highly motile sperm gives improved fertilizing ability and longevity in assisted reproductive procedures. The objective of our study was to test the efficacy of two commercially available density gradient media (Puresperm - a newly introduced product, Nidacon International, Gothenburg, Sweden, and ISolate, Irvine Scientific, Santa Ana, CA, USA) used for assisted reproduction. These 2 gradients are Hepes buffered, isotonic, colloidal silica suspensions in 2 densities. Puresperm is: 40% - 80% and ISolate is: 50% - 90%, gradient.

Material and Methods: We compared the pre and post wash sperm characteristics [count, motility, recovery rate, morphology, and reactive oxygen species (ROS) levels] of the sperm fractions obtained after processing 13 semen specimens with the two media. The above sperm parameters were further analyzed in specimens categorized by normal motility ($\geq 50\%$, $n = 7$) or abnormal motility ($< 50\%$, $n = 6$) in neat semen.

Results: Semen specimens processed by Puresperm gave higher recovery of total sperm count ($p = 0.001$), and total motile sperm count ($p = 0.002$) than ISolate. The recovery rate for Puresperm was 37% higher than ISolate (mean \pm SD 37.1 ± 22.1 vs. 23.5 ± 14.5 , $p = 0.006$). Motility and ROS levels were similar in the two fractions ($p = 0.96$ and 0.38 , respectively). ROS production was insignificant in the 2 mature sperm fractions recovered after a 20-minute centrifugation step involved in the gradient separation indicating a lack of oxidative stress. Significantly higher rates of recovery were seen in Puresperm processed specimens compared to ISolate in either normal motility group (47 ± 24.8 vs. 28.5 ± 16.7 , $p = 0.04$) or abnormal motility group (25.6 ± 11.8 vs. 17.8 ± 9.9 , $p = 0.003$). Sperm fractions from both gradients showed a high percentage of normal sperm forms by both WHO and Kruger's methods.

Conclusions: We recommend the use of Puresperm for ART purposes as higher rates of recovery of mature motile sperm in specimens processed for ART is associated with higher fertilization and pregnancy rates. Puresperm not only gives higher recovery but is also cost effective (ISolate is 42% more expensive than Puresperm in the United States).