EFFECT OF "SWIM-UP" PROCESSING ON OVERALL POSTTHAW SPERM QUALITY. Sandro C. Esteves, Campinas, Brazil; Rakesh K. Sharma, Anthony J. Thomas Jr. and Ashok Agarwal, Cleveland, OH (Presented by Dr. Esteves).

INTRODUCTION AND OBJECTIVES: The fertilizing ability of cryopreserved human spermatozoa is impaired as a result of sperm membranes damage caused during the freeze-thaw process. We determined whether selecting a sperm population with improved motion characteristics before freezing can reduce the deleterious effects of cryopreservation.

METHODS: Semen specimens were obtained from 15 fertile donors. After liquefaction, each ejaculate was divided into two aliquots. One aliquot was processed by the "swim-up" technique to select a sperm population with better motility and motion characteristics whereas the other received no special processing. Both aliquots were then cryopreserved by the liquid nitrogen vapor method. Percent motility and motion characteristics were evaluated by computer-assisted semen analysis. Sperm viability and the acrosome reaction (AR) (spontaneous and calcium ionophore-induced) was examined by fluorescein iso-thiocyanate conjugated peanut lectin (FITC-PNA) combined with the supra-vital dye, Hoechst-33258.

RESULTS: Sperm selected with the swim-up treatment had better motion characteristics, percent motility and viability before freezing (P < 0.001). Before freezing, the frequency of acrosome intact spermatozoa was similar in both treated and control groups (P = 0.63). After thawing, swim-up specimens exhibited improved sperm motion characteristics (curvilinear velocity and average path velocity) compared to the untreated specimens (P < 0.001). In addition, the percentage of spermatozoa with an intact acrosome that underwent induced AR were significantly higher in the treated group (P < 0.05).

CONCLUSIONS: Selecting a sperm population with greater motility before freezing enhances the overall quality of post-thaw spermatozoa. This treatment appears to minimize the deleterious effects of the freeze-thaw process on human sperm and so may improve fertilization rates for assisted reproductive procedures such as intrauterine insemination or in vitro fertilization.