

# SPERM PREPARATION WITH SPERMGRAD SHOW POSITIVE EFFECT ON AVERAGE TELOMERE LENGTH, SPERM MOTILITY AND DNA FRAGMENTATION

Telomeres are non-coding DNA sequences at the ends of eukaryotic chromosomes. There is an increasing interest within the IVF field regarding telomere length and their role in early human embryonic development. Two recent studies by professor Yingspu Sun investigate the effect of density gradient centrifugation on sperm telomere length which is suggested to play an important role in reproduction.

## Result

In the first study<sup>1</sup>, semen samples from 105 infertile men were collected. The sperm preparation was performed with density gradient separation (DGS) using SpermGrad™ (Vitrolife). The sperm chromatin dispersion test and quantitative PCR was used to determine DNA fragmentation and telomere length. The relative mean telomere length ratio (T/S ratio) was proportional to the average telomere length of the sample.

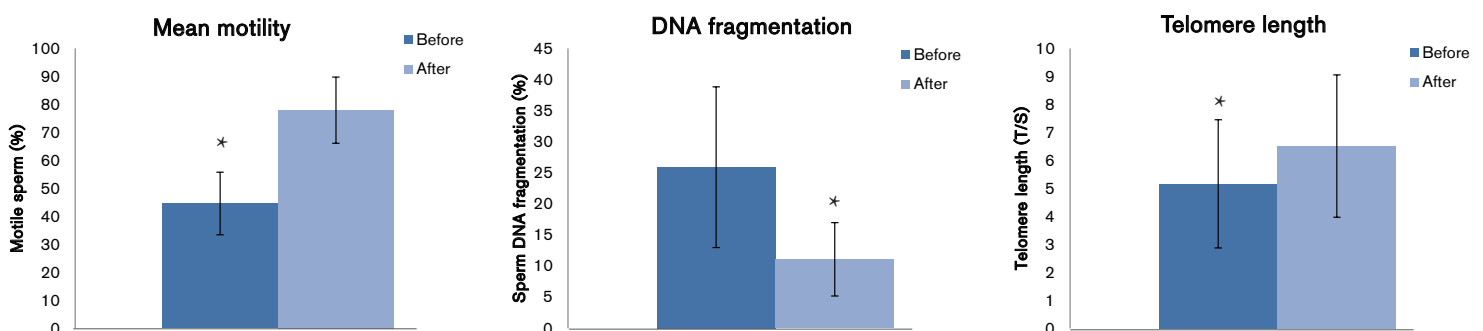
DGS using SpermGrad (90% and 45%) resulted in a significant higher mean motile sperm rate after processing (78%) compared to raw semen (45%), and DNA fragmentation rate was significantly reduced after preparation (11 % versus 26 % in raw semen). Furthermore, the average sperm telomere length was significantly higher after DGC compared to raw semen (see Figure 1).

In the second study<sup>2</sup>, sperm mean telomere length (determined by quantitative PCR) was compared to the IVF outcome.

Data were collected from 418 couples undergoing their first IVF cycle, and significant correlations were found between telomere length and both good embryo quality and transplantable embryo rates.

## Conclusions

Significant correlations are found between sperm telomere length and the quality of early embryonic development. Density gradient centrifugation using SpermGrad (Vitrolife) enrich for sperm with high mobility and low DNA fragmentation and is the preferred technique for selection of sperm with longer telomeres.



**Figure 1.**

The mean motile sperm rates, sperm DNA fragmentation rates, and average telomere length in raw semen and after processing by DGC using SpermGrad. \* $p < 0.01$

## REF

1. Yang Q., et al. Processing of semen by density gradient selects spermatozoa with longer telomeres for assisted reproduction techniques. *Reproductive BioMedicine Online* (2015) 31, 44-50. 2. Yang Q., et al. Sperm telomere length is positively associated with the quality of early embryonic development. *Human Reproduction* (2015), 30 (8), 1876-1881