

P22

The effect of incubation time and temperature on sperm motility, human sperm DNA and assisted reproductive technologies (ART) outcome

EA van Zyl, ML Windt-de Beer, E Erasmus

Tygerberg Fertility Clinic, Department of Obstetrics & Gynaecology, University of Stellenbosch

INTRODUCTION:

In Assisted Reproductive Technologies procedures, semen samples are handled, processed, prepared and manipulated before use in the fertilization process. During these incubation times, the sperm cells are exposed to factors that may inflict damage to the sperm structure and DNA integrity, impair its functional abilities and lead to fertilization failure and poor ART outcome. Two of the basic, but important factors that may have an impact on the sperm quality are time and temperature exposure.

AIM:

The primary objective of this study was to prospectively determine the effect of different incubation times and temperatures on motility and the DNA profile of the spermatozoa.

MATERIALS and METHODS:

Non-processed and processed semen samples were incubated for different time intervals and at different temperatures. After incubation, sperm parameters were assessed and CMA3 and TUNEL assays were applied to assess the level of DNA fragmentation.

RESULTS:

The results showed that in the non-processed group, incubation led to a time-dependent decline in motility. Incubation time and temperature did not affect CMA3 and TUNEL values. Incubation of the processed sample led to a time-dependent decrease in the motility. The CMA3 and TUNEL values between the different incubation groups did not differ. The secondary objective was to retrospectively investigate the effect of sperm incubation time after preparation on ART outcome. A total of 901 patient ART cycles were included. Fertilization rates, embryo quality and pregnancy rates were examined. The results showed that the sperm incubation time before insemination between in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI) differed and the incubation time had a negative effect on the fertilization rates in IVF. Longer incubation times led to an improvement in the quality of day 2 embryos and were associated with pregnancy failure in IVF and ICSI.

CONCLUSION:

Shorter incubation times had the most beneficial effect on the motility of the sperm cells. In contrast with our hypothesis, we found that higher incubation temperatures were advantageous to the motility and also the DNA fragmentation levels. Longer incubation times also led to decreased fertilization rates in IVF cycles. It is therefore vital that incubation time and temperature should be monitored