Male factor and its impact on IVF/ICSI treatment: a retrospective cohort study of 731 cycles

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OBJECTIVE

This study aims to evaluate the male factor impact on the intracytoplasmic sperm injection (ICSI) treatment outcomes following preimplantation genetic testing (PGT).

METHODS

This retrospective, observational, longitudinal cohort study involved 731 ICSI cycles performed at LabForLife Reproductive Medicine from January 2019 to June 2023. The female partner's age was limited to under 35 years old. The cohort was divided into five groups according to the male partner's sperm parameters, based on the fifth percentile of the World Health Organization (WHO) semen manual 6th edition (2021). According to the male partners, the groups were: 1) Normozoospermic, 2) Severe oligozoospermic (sperm number <5 million/mL), 3) Epididymal sperm (PESA - Percutaneous Epididymal Sperm Aspiration and MESA - Microscopic Epididymal Sperm Aspiration), 4) Testicular sperm (TESE - testicular sperm extraction and microTESE - microdissection testicular sperm extraction) and 5) Surgical sperm retrieval (group 3 and 4 together). The data distributions were previously verified using the Shapiro-Wilk test. Data on fertilization rate, blastulation rate (blastocysts per fertilized oocyte), and euploidy rate were analyzed using Kruskal-Wallis test followed by Dunn's post hoc tests. Results were presented as median (95% CI), $p<0.05$ was considered statistically significant.

RESULTS

A total of 8072 metaphase II oocytes were inseminated. The fertilization rate was significantly reduced (H4= 52.79; P<0.001) in MESA/PESA 73.2% (68.4, 80.3; P=0.003), TESE/microTESE 54.2% (48.6, 70.2; P<0.001) and surgical sperm retrieval 67.4% (65.1, 75.8; P<0,001) when compared with Normozoospermic 86.7% (82.7, 85.1), Interestingly, there was not significantly difference when compared to Severe oligozoospermic patients 82.8% (76.9, 83.8; P=0.207). Blastulation rate was significantly reduced (H4= 42.40; P<0.001) in Severe oligozoospermic 50% (46.0, 55.5; P < 0.001), TESE/microTESE 29.2% (10.2, 48.9; P<0,001) and surgical sperm retrieval 51.7% (39.7, 56.0; P < 0.002) when compared with Normozoospermic 66.7% (59.7, 63.7). Euploidy rates were not significantly different (H4= 0.38; P= 0.984) in the male factor groups compared to Normozoospermic patients.

CONCLUSION

This study demonstrates that severe male factor, mainly when it is used epididymal and testicular spermatozoa, impairs embryo developmental competence, regarding fertilization and blastulation rate. When severe oligozoospermic patients were analyzed, despite the fertilization rate was not affected, the blastulation rate significantly decreased. Perhaps the sperm-oocyte initial interaction and the DNA repair mechanisms of the oocyte could compensate the male factor, which is reinforced by the fact that only female partners under 35 years old were included in the study. It was also observed that the euploidy rate was not affected by the male factor, independently of its gravity.

This finding corroborates previous studies, and it raises the discussion of whether PGT should be advised to patients with the male factor as the sole cause of infertility.

KEYWORDS

Male infertility; Male factor; Surgical sperm retrieval; In vitro fertilization; Preimplantation genetic testing.