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Title:

Male Factor Infertility and Aneuploidy: Do Couples With Male Factor Infertility Have a Lower Rate of Euploid Embryos?

Authors:

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Objective:

Few studies have used comprehensive chromosomal screening (CCS) to evaluate impaired spermatogenesis contribution to aneuploidy rate and cycle outcome. This study examines male factor infertility in IVF couples to understand if it lowers euploid embryo rates and/or compromises pregnancy outcome.

Design:

Retrospective

Materials and Methods:

All patients who underwent IVF-CCS and had ≥ 1 embryo biopsied from July 2002 to April 2016 were included. Couples without male factor infertility were considered controls. To control for aneuploidy incidences associated with advanced age, females >40 were excluded. The rate of euploidy per embryo biopsied was calculated. The effect of male factor on euploidy rate and pregnancy outcome was modeled by logistic and multivariate logistic regression, accounting for male/female age, and sperm concentration and morphology (alone and combined). A secondary analysis grouped couples by male factor type (A: oligozoospermia; B: azoospermia; C: oligozoospermia + azoospermia; D: None) using Chi-square analysis. Further analysis compared Groups A, B, and C (as a combined "male factor" group) with group D ("non-male factor").

Results:



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In all couples evaluated (n=550), neither male age nor any combination of male factor parameters was associated with euploidy rate when controlling for female age. In couples who underwent SET with a euploid embryo (n=503), both euploidy rate and sperm concentration

($p < 0.05$) were positively correlated with pregnancy rates, and neither was correlated with early pregnancy loss. No significant differences in euploidy rate or pregnancy outcome were observed among male factor Groups A, B, C or D. There was a significantly lower incidence of miscarriage in the male factor than the non-male factor group ($p < 0.05$). No significant differences between the male factor and non-male factor groups were found in euploidy rate or other pregnancy outcomes.

Table:

Outcome	Male Factor	Non Male Factor	P value
Euploid Per Biopsy Rate	0.66	0.59	0.214
Biochemical Preg Rate	0.34	0.34	0.939
Clinical Preg Rate	0.29	0.25	0.996
Miscarriage Rate	0.25	0.43	*0.036
Ongoing Preg at Discharge Rate	0.25	0.19	0.15

Conclusions:

When controlled for oocyte age, couples with male factor infertility appear to have a similar rate of euploidy per embryo biopsied as compared to couples without male factor. In patients with at least one euploid embryo available for transfer, the rate of pregnancy appears to be correlated with both euploid per biopsy rate and sperm concentration; however, there is no effect on other pregnancy parameters. The rate of miscarriage after IVF-CCS with SET appears to be lower in couples with male factor infertility as compared to those with non-male factor etiologies, however this may be related to the incidence of PCOS and other etiologies of infertility in the non-male factor patients. Overall, the utility of IVF-CCS is a positive driver for cycle success in couples faced with male factor infertility.

Support:

None

References:

1. Gianaroli L, Magli MC, Ferraretti AP. Sperm and blastomere aneuploidy detection in reproductive genetics and medicine. *J Histochem Cytochem* 2005; 53:261-67.
2. Coates A, et al. Use of suboptimal sperm increases the risk of aneuploidy of the sex chromosomes in preimplantation blastocyst embryos. *Fertil Steril* 2015; 104(4):866-72.