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Title:

BLASTOCYST QUALITY AND EUPLOIDY RATE IN COUPLES WITH BALANCED TRANSLOCATIONS AFTER UNDERGOING AN IVF-PGD CYCLE: A 10-YEAR EXPERIENCE IN A SINGLE INFERTILITY CENTER

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Background:
Patients with a history of early pregnancy loss (EPL) or who have had a diagnosis of an abnormal karyotype in tested products of conception commonly undergo karyotype testing. Couples who are diagnosed as carriers of balanced translocations have a greater incidence of developing embryos with segmental chromosomal imbalances. A treatment option for these couples is to undergo in-vitro fertilization (IVF) with pre-implantation genetic diagnosis (PGD) to perform selective embryo transfer of an euploid blastocyst, in order to reduce the risk of further pregnancy loss.

Objective:
Evaluate the percentage of "good quality" blastocysts per fertilized zygote and the rate of embryo euploidy in couples with balanced translocations compared to couples with known normal karyotypes but with similar infertility histories.

Design:
Retrospective cohort study.

Materials and methods:
We compared embryo development in couples where one partner was a carrier of a balanced translocation, to embryo development in couples known to both have normal karyotypes. Main

outcome measures were: average number of oocytes retrieved, fertilization rate, total good quality embryos on D5/D6 and the euploidy rate. Good quality embryos were described as (>3BB). Couples known to have normal karyotypes were used as the control group. Model significance was assessed by chi-square with significance where $p<0.05$.

Results:

53 couples were diagnosed with one partner carrying a balanced translocation, these couples underwent 188 cycles of ART, of which 143 were completed. A total of 39 IVF cycles (fresh and cryopreserve-all) underwent PGD by quantitative real-time PCR performed on trophectoderm biopsies. Patients were stratified into age groups, Group A (<35), Group B (35-37), Group C (38-40), Group D (40-42). The average oocyte age for patients with translocations was 33.6±4.6 and 36.1±3.5 for couples with normal karyotypes ($p=0.01$). The only significant difference between the two studies groups was the rate of euploidy ($p<0.05$).

Conclusions:

Couples who carry a balanced translocation produced a similar number of good morphologic quality blastocysts compared to couples with normal karyotypes. A significant difference was noted in embryonic aneuploidy rate between the groups. We concluded that while blastulation rate was not affected by the presence of a balanced translocation, PGS may be indicated to optimize reproductive outcome.