

A significant success of aneuploidy screening: identification of a new research arena for implantation failure.

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Introduction

In 2011, a transport aneuploidy screening programme was commenced between IVFAustralia in Sydney and MelbourneIVF. This study is the first detailed analysis of the programme.

Methods

Embryo blastomeres biopsied on day 3 were loaded into PCR tubes and flown to Melbourne overnight. Microarray (Bluegnome) results were faxed back for a day 5 transfer.

Results

529 women had egg collections and fertilisation by ICSI. 428 cycles (80.9%) had embryos suitable for biopsy, and 234 cycles resulted in at least one euploid embryo leading to 220 fresh transfers (41.6%). As expected, female age had a significant impact on outcome based on cycle started, as embryo euploidy rates were 90/961 (9.4%) embryos tested in >38, compared with 241/813 (29.6%) in women aged <38. However, there was also a significant difference in clinical pregnancy rates per euploid embryo transfer in women under 38 (41%) compared to those over 38 (22%; $p < 0.001$). 210 embryos were frozen. In subsequent thaw cycles, over the same period, 74 cycles resulted in 26 clinical pregnancies (36%).

Embryo quality also had an impact on outcome. Amongst all euploid embryos transferred (244), pregnancy rates were 20% for morulas, 40% for very early, early, and expanded blastocysts, and 58% for hatching blastocysts. There were significant biochemical losses with fetal heart activity recorded in only 81/108 pregnancies (75%). Embryo quality was not predictive of early losses.

Conclusions

This day 3 biopsy programme has demonstrated acceptable pregnancy rates in couples primarily with indications such as repeated IVF failure or miscarriage, or advanced maternal age. But it is also clear that a relatively high number of good quality euploid embryos fail. Those

women should be the target of future research in egg, sperm and endometrial factors to improve future implantation rates.