PRESS RELEASE

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Changes in chromosomal constitution of preimplantation embryos suggest caution in genetic screening

Nice, France: Embryos that are selected out as abnormal can undergo chromosomal modifications, a scientist will tell the annual conference of the European Society of Human Genetics in Nice, France, today (Tuesday 19 June). Ms Tsvia Frumkin, from the Racine IVF unit, LIS Maternity Hospital, Tel Aviv Sourasky Medical Centre, Tel Aviv, Israel, will tell the conference that her team's findings meant that the results of preimplantation genetic screening (PGS) for chromosomal abnormalities were not always reliable and should be interpreted with caution.

PGS is offered to women with recurrent IVF failures as well as repeated miscarriages. It is based on the concept that the entire chromosomal constitution of an embryo can be represented by a single cell, which is removed from the embryo. If one biopsied cell is found to be abnormal, there is a 90% chance that the rest of the embryo is also abnormal or mosaic, where two or more cells with different chromosomal constitution exist in a single embryo.

Ms Frumkin analysed 8 cell embryos at day 3 of development using the FISH (fluorescence in situ hybridization) technique. Two cells from each embryo were analysed, and between 5 and 9 chromosomes were investigated. The abnormal embryos were re-analysed on day 5, using the same method. "By comparing FISH results of day 5 embryos to the abnormal results of the same embryos on day 3, we could elucidate the origin of the chromosomal aberrations and follow different chromosomal modifications as they occurred during preimplantation period. The timing is significant because embryos used in IVF are normally transferred at between 3 and 5 days old", says Ms Frumkin.

“We found that embryos which were abnormal on day 3 demonstrated a high rate of mosaicism However, on day 5 some of them had undergone ‘self-correction’ into normal embryos. Others kept the same abnormalities, while some had acquired additional chromosomal abnormalities”, she says.

Following the research, Ms Frumkin’s hospital has decided to offer PGS only to patients after they have undergone more than 6 previous failed IVF cycles, been checked for and found to have normal chromosomal make-up, and produced more than 6 good quality embryos. “Even in cases that fulfil these conditions, we nevertheless prefer transferring more embryos back to the uterus rather than carrying out PGS biopsies for them on day 3, assuming that natural selection will usually favour the normal embryos for implantation,” she says.

“Our results can explain why PGS would not be able to increase pregnancy potential but rather can serve as a prognostic tool in a limited number of cases”, says Ms Frumkin. “It can also help us make optimal decisions about the value of switching to a different assisted reproduction technique, for example egg donation.”

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