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ART is not a risk factor for chromosomal abnormality of the embryo based on the analysis of 533 aborted products of conception

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Objective: Chromosomal abnormality is one of the major causes in miscarriages. Implication of ART on Chromosomal abnormality has been discussed, but conclusion has not reached. In this study, we have analyzed chromosomes of POC (Product of conception) of miscarried pregnancies from ART or non-ART such as IUI and timed intercourse in order to determine if ART caused chromosomal abnormality more than non-ART.

Design: Retrospective laboratory study at private fertility clinic.

Materials and Methods: Aneuploidy and structural abnormality of chromosomes in 533 POC (non-ART: n=163 and ART: n=370) from Jul. 2002 to Dec. 2011 were analyzed. Non-ART was subdivided into natural pregnancy (n=125) and IUI (n=38). ART was subdivided into conventional IVF (cIVF: n=88) and ICSI (n=282).

Results: Chromosomal abnormality was determined in 71.9% of all samples, 67.7% was aneuploidy and 5.4% was unbalanced structural abnormality. Chromosomes 16 and 22 were most frequently affected in both groups. Aneuploidy from non-ART was 69.9% (113 autosomal, 4 sex chromosome and 16 polyploidy samples) which was similar to ART 66.8% (263, 20 and 9 samples, respectively). There were no significant differences between non-ART vs. ART, natural (68.8%) vs. IUI (73.7%), and cIVF (61.4%) vs. ICSI (68.4%). Similar results were obtained in sex chromosomal abnormality. However, polyploidy in non-ART (9.8%) was significantly higher compared to ART (2.4%). Polyploidy rates between natural (9.6%) vs. IUI (10.5%) were similar and cIVF (2.3%) vs. ICSI (2.5%) as well. As to unbalanced structural abnormality, there were no significant differences in any comparison between non-ART (6.1%) vs. ART (5.1%), natural (8.0%) vs. IUI (0%) and cIVF (6.8%) vs. ICSI (4.6%).

Conclusions: This study suggests that ART is not a risk factor of chromosomal abnormalities. ICSI is safe for fertilization as well. Moreover, lower occurrence of polyploidy was determined in ART due to the inspection of pronuclear number. Safety of ART is identical to classic infertility treatment.

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