

Incidence of Embryonic Aneuploidy in Different Age Groups of Saudi Population Undergoing PGS-ICSI

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INTRODUCTION: Preimplantation Genetic Screening (PGS) is becoming more frequently employed for detection of aneuploid embryos to prevent transmission of genetic defects. A few cells are micro-surgically removed from the embryo to analyze the DNA, thus selecting embryos with the highest potential for implantation to optimize a woman's chance of healthy live birth and reduce the risk of miscarriage due to chromosomal aneuploidy. The objective of this study was to determine incidence of embryonic aneuploidy in different age groups of Saudi patients undergoing ICSI-PGS cycles from Jan to Dec 2016 at Thuriah Medical Center, Riyadh, Saudi Arabia.

MATERIALS AND METHODS: Data from 248 patients undergoing ICSI-PGS were analyzed. The ovarian stimulation, oocyte retrieval, ICSI, PGS, culture and transfer were performed by standard protocols. All sperm samples were from male partners; 242 fresh ejaculates, 4 frozen-thawed Micro-TESE and 2 TESA. The embryo biopsies were performed on day-3 (Fig 1) and analyzed using fluorescence in-situ hybridization with probes for chromosomes 13, 18, 21, X and Y. The total embryos analyzed were 1055 and grouped into normal, abnormal, mosaic and undiagnosed. The patients were grouped into following age categories; <35, 35-37, 38-40, 41-42 and 43-48 yrs. The statistical analyses were performed by SPSS.

RESULTS: The percentages of euploid embryos were; 43, 46, 42, 24 and 28 in <35, 35-37, 38-40, 41-42 and 43-48 yr females, respectively (Table 1). The percentages of aneuploidy embryos were; 36, 32, 37, 53 and 54 in these study groups, respectively. The percentages of normal embryos decreased and percentages of abnormal embryos increased significantly in females >41 yrs of age. The percentage of mosaic embryos was significantly higher in 43-48 yr females. The pregnancy rate was 28, 33, 22, 0 and 25 % in <35, 35-37, 38-40, 41-42 and 43-48 yrs age groups, respectively. In an earlier study of Saudi population conducted in 2013, the abnormal embryos constituted 36 % in women with an average age of 34.9 yrs (1). In our study the % abnormal embryos in < 35 years age group is similar; however, it increased significantly in women ≥ 41 yrs. Such data is not available in the previous report.

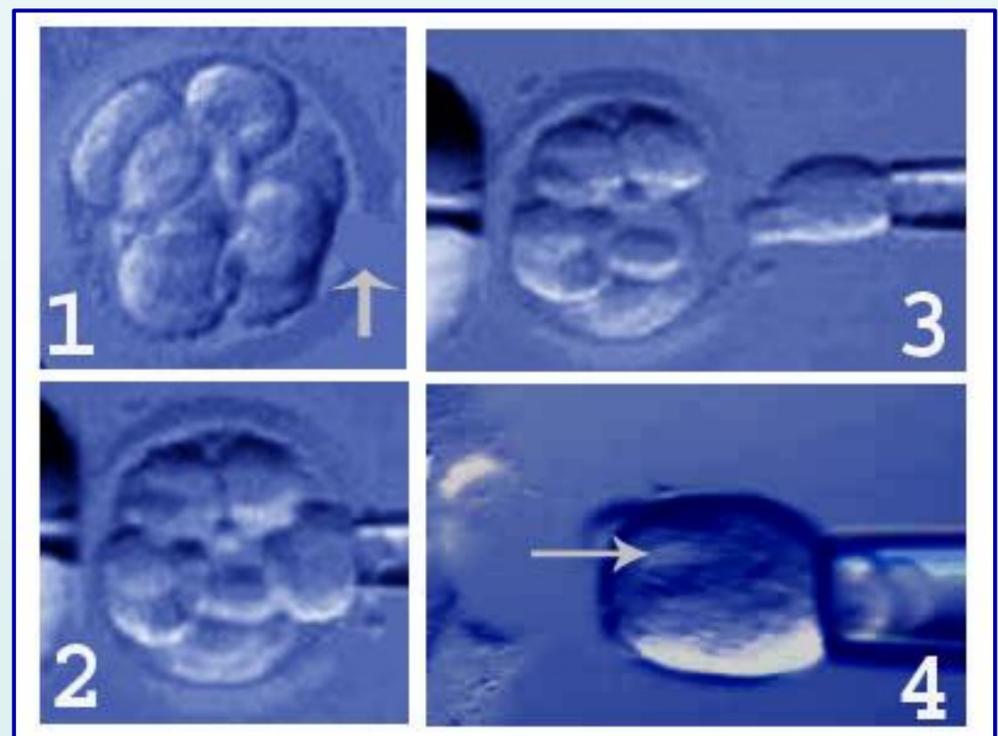


Fig 1: Embryo Biopsy Procedure; (1) Arrow indicates Laser assisted zona hatching. (2) Embryo is held on left side by a holding pipette and biopsy pipette is inserted from the right side. (3) One blastomere is identified with visible nucleus, gently aspirated by the biopsy pipette and taken out of zona. (4) Arrow indicates nucleus in the blastomere.

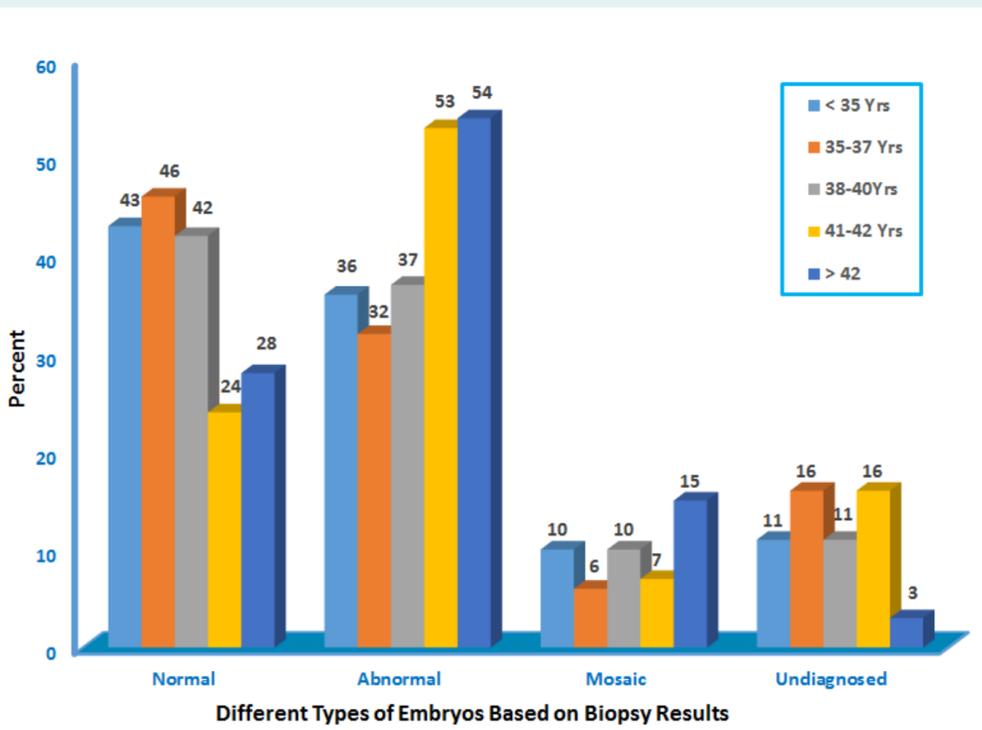


Fig 2. Comparison of Normal, Abnormal, Mosaic and Undiagnosed Embryos in Different Age Groups

CONCLUSION: The embryonic aneuploidy rate is similar until age 40, however, it increases significantly in embryos from 41 yrs or older women.

REFERENCE:

1. Abotalib, Z. Preimplantation genetic diagnosis in Saudi Arabia. Bioinformation. 2013. 9(8):388-393.

Table 1: Normal, abnormal, mosaic and undiagnosed embryos in different female age groups. Values are No (%).

Women Age (#)	<35 (n=107)	35-37 (n=63)	38-40 (n=42)	41-42 (n=19)	43-48 (n=17)
	No (%)	No (%)	No (%)	No (%)	No (%)
Biopsied	495	261	174	58	67
Normal	214 (43)	120 (46)	73 (42)	14 (24)	19 (28)
Abnormal	180 (36)	84 (32)	65 (37)	31 (53)	36 (54)
Mosaic	48 (10)	15 (6)	17 (10)	4 (7)	10 (15)
Undiagnosed	53 (11)	42 (16)	19 (11)	9 (16)	2 (3)