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Preimplantation Diagnosis for Aneuploidies in Patients Undergoing In-Vitro Fertilization With a Poor Prognosis: A Systematic Review and Meta-Analysis. A. M. Abou-Setta, H. G. Al-Inany, R. T. Mansour, A. K. Taha, G. I. Serour, M. A. Aboulghar. The Egyptian IVF-ET Center, Cairo, Egypt.

OBJECTIVE: Patients with increased maternal age and/ or repeated IVF failures are given a guarded prognosis due to the relatively poor outcomes that occur with these groups. Different techniques have been used to help increase the chance of pregnancy including Assisted Zona Hatching and Preimplantation Genetic Diagnosis (PGD) for aneuploidies.

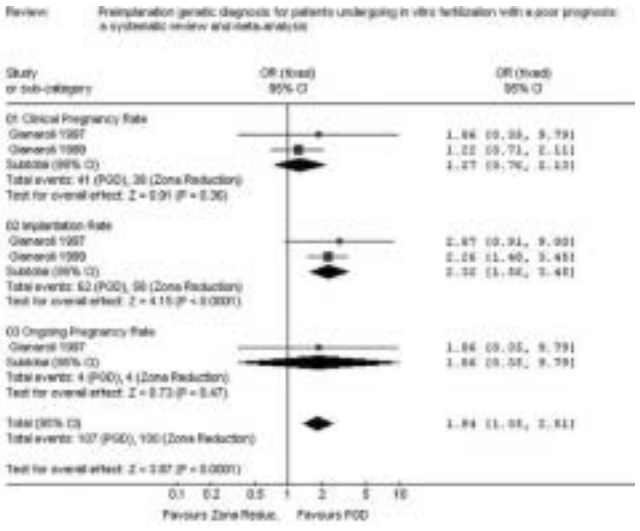
DESIGN: Systematic review and meta-analysis of prospective, controlled trials comparing Assisted Zona Hatching and Preimplantation Genetic Diagnosis (PGD) for aneuploidies in patients undergoing in vitro fertilization with a poor prognosis due to advance maternal age and/ or repeated IVF failures.

MATERIALS AND METHODS: A computerized search was conducted using MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials (CENTRAL) on the Cochrane Library Issue 2, 2005, the National Research Register (NRR) and the Medical Research Council's Clinical Trials Register. The following Medical Subject Headings (MeSH) and text words were used: preimplantation genetic diagnosis, assisted zona hatching, aneuploidy, IVF failures, maternal age and controlled trial(s), randomised controlled trial(s), randomized controlled trial(s). The reference lists of all known primary studies and review articles were also examined to identify additional relevant citations. In addition, a hand search of the citation lists of relevant publications, review articles; abstracts of scientific meetings and included studies were searched for trials. For the meta-analysis, in the absence of heterogeneity, results were pooled using a fixed effect model, the relative risk and risk difference (and 95% confidence intervals). Where statistical heterogeneity was found, statistical synthesis of the results using a random effects model was undertaken.

RESULTS: A total of two prospective controlled trials (RCTs) were located that evaluated the use of Preimplantation Genetic Diagnosis for aneuploidies vs. Assisted Zona Hatching for patients undergoing in vitro fertilization with a poor prognosis (Gianaroli et al., 1997; Gianaroli et al., 1999). As for the implantation rate, using the fixed effect model, pooling of the results demonstrated a statistically significant increased chance of embryo implantation in patients that underwent PGD (62/ 252) vs. Assisted Zona Hatching (58/ 470) ($P < 0.0001$; O.R 2.32; 95% CI 1.56 - 3.45). As for the clinical pregnancy rate, using the fixed effect model, pooling of the results demonstrated no statistical significance between the two groups: PGD (41/ 138) vs. Assisted Zona Hatching (38/ 152) ($P = 0.36$; O.R 1.27; 95% CI = 0.76 - 2.13).

CONCLUSION: Using preimplantation diagnosis for aneuploidies in patients undergoing in vitro fertilization with a poor prognosis due to increased maternal age and/or multiple IVF failures may increase the implantation rate and therefore reduce the numbers of embryos needed to be transferred. More trials are needed to further confirm these results.

Supported by: None



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Preimplantation Genetic Diagnosis for Aneuploidy Screening Using a 9 Probe Chromosome Panel: Prevalence of Abnormal Embryos and no Embryo Transfer in Older Women. M. B. Doyle, B. E. Miller, J. Gagne, V. Williams, M. Perretti. Connecticut Fertility Associates, Bridgeport, CT; Serono, Inc. , Rockland, MA.

OBJECTIVE: The purpose of this investigation was to evaluate the clinical utility of preimplantation genetic diagnosis for aneuploidy screening using a 9 probe chromosome panel in patients undergoing IVF.

DESIGN: Retrospective analysis of data from a private IVF center in the USA.

MATERIALS AND METHODS: This evaluation included data from 73 women (n=652 embryos) who underwent IVF with PGD in 2004. Indications for PGD included advanced age, recurrent abortion, and/or repeated IVF failure. Patients were grouped according to 2 age groups (<40 yrs and ≥ 40 yrs). Embryos from each patient were biopsied, analyzed and diagnosed at a reference laboratory using a 9 probe chromosome panel. Embryos were considered aneuploidy if the PGD result indicated monosomy, trisomy, complex abnormal or haploid. We also assessed whether or not patients in each group had an embryo transfer based on the PGD result. Data were analyzed using Chi-square for aneuploidy rate and Fisher's Exact test for the percentage of patients with no embryo transfer. Statistical tests were not used when comparing pregnancy rates since the power of the test would be below the desired power based on the number of patients.

RESULTS: In general, the rate of abnormal embryos in both groups was high, however the ≥ 40 group had a significantly higher abnormal rate compared to the younger group. Interestingly, the older group also had a much higher percentage of patients with no embryos available for transfer, based on the PGD result, despite the finding of morphologically normal embryos on day 3 and 5. Pregnancy rate per embryo transfer was similar between the groups, but were surprisingly higher in the older group.

Age Group	# Embryo Biopsied	# Embryo normal	Aneuploidy Rate (%)	Pts with no ET (%)	PR/ET	PR/Pt
< 40 yrs n=44	389	121	69%	4.5 % (2/44)	40.5% (15/37)	38.5% (15/39)
≥ 40 yrs n=29	263	47	81%	31 % (9/29)	44.4 % (8/18)	29.6% (8/27)
p value			<0.001	0.005		

CONCLUSION: It appears that PGD using a 9 probe chromosome panel results in a high percentage of embryos diagnosed as abnormal, especially in women 40 yrs and older. A recent abstract from Sarajari et al. (PCRS, 2005) reported an abnormal rate of about 62% in a group of patients with a mean age of 37 yrs old. Notably, a greater percentage of women in the older group had no embryos available for transfer based on the PGD result. Despite the high rate of abnormal embryos in the >40 group, the reported favorable pregnancy rates in these older patients may suggest that PGD provided some clinical benefit in the selection of embryos for transfer. We continue to assess the clinical utility of PGD for aneuploidy screening in our IVF program

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Preimplantation Genetic Diagnosis (PGD) for Complex Cases of Structural Chromosome Aberrations. T. Escudero, J. Fischer, C. Cinnioglu, S. Munne. Reprogenetics, San Francisco, CA; Reprogenetics, West Orange, NJ.

OBJECTIVE: To evaluate the frequency of normal embryos and the pregnancy rate after PGD in carriers of complex translocations involving three chromosomes or two translocations simultaneously.