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VAKIF ÜNİVERSİTESİ
— 1845 —

Assessment of PGT-A Outcomes According to the Indications for IVF Treatment

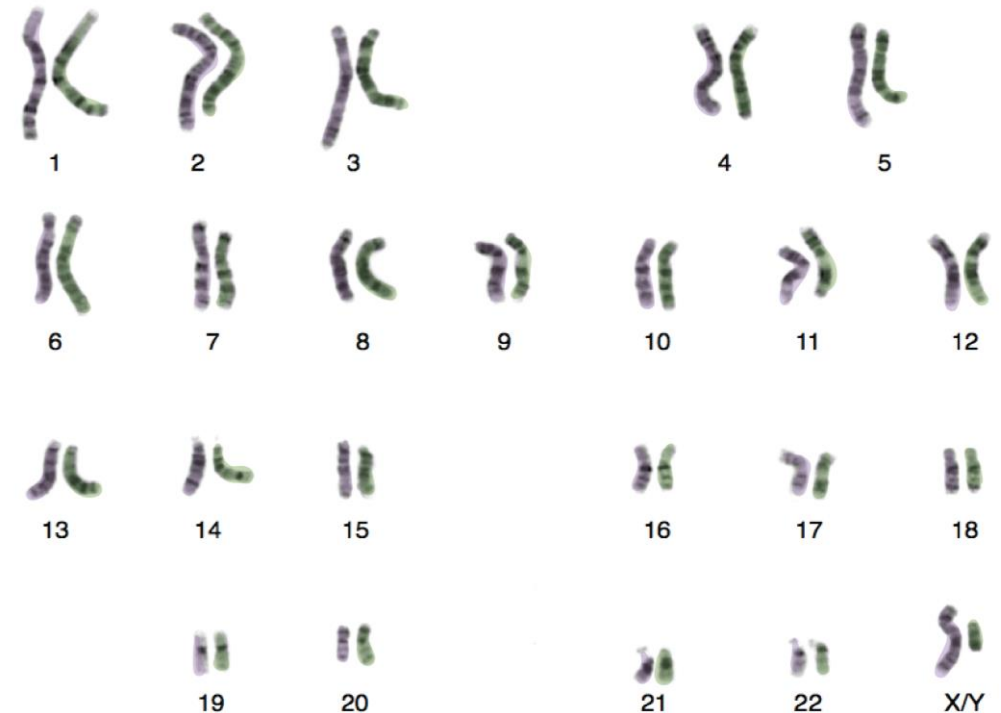
Ege Yağbasan, Prof. Dr. Pınar Özcan, Uzm. Dr. Fatma Başak Tanoğlu

Introduction

- ❑ **Infertility:** defined as the failure to achieve pregnancy after 12 months of regular unprotected sexual intercourse.
- ❑ Approximately 85% of infertile couples have an identifiable cause.
- ❑ **Common causes of infertility:**
 - ❑ ovulatory dysfunction
 - ❑ tubal disease
 - ❑ male factor

Introduction

- ❑ Human cells contain 23 pairs of chromosomes
- ❑ **Aneuploidy:** The presence of an abnormal number of chromosomes in the cells
- ❑ Aneuploidy is an important cause of miscarriages and in vitro fertilization (IVF) failure.
- ❑ Preimplantation genetic testing for aneuploidy (PGT-A) provides the opportunity to select euploid embryos for embryo transfer within IVF procedure.



Importance of PGT-A

- ❑ **PGT-A:** biopsy of a few cells from the developing embryo
- ❑ Helps doctors select euploid embryos to transfer
- ❑ Reduced miscarriage rates
- ❑ Higher pregnancy rates per transfer



Randomized Controlled Trial > Fertil Steril. 2019 Dec;112(6):1071-1079.e7.
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Preimplantation genetic testing for aneuploidy versus morphology as selection criteria for single frozen-thawed embryo transfer in good-prognosis patients: a multicenter randomized clinical trial

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Collaborators, Affiliations + expand

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Abstract

Objective: To evaluate the benefit of next-generation sequencing (NGS)-based preimplantation genetic testing (PGT-A) for embryo selection in frozen-thawed embryo transfer.

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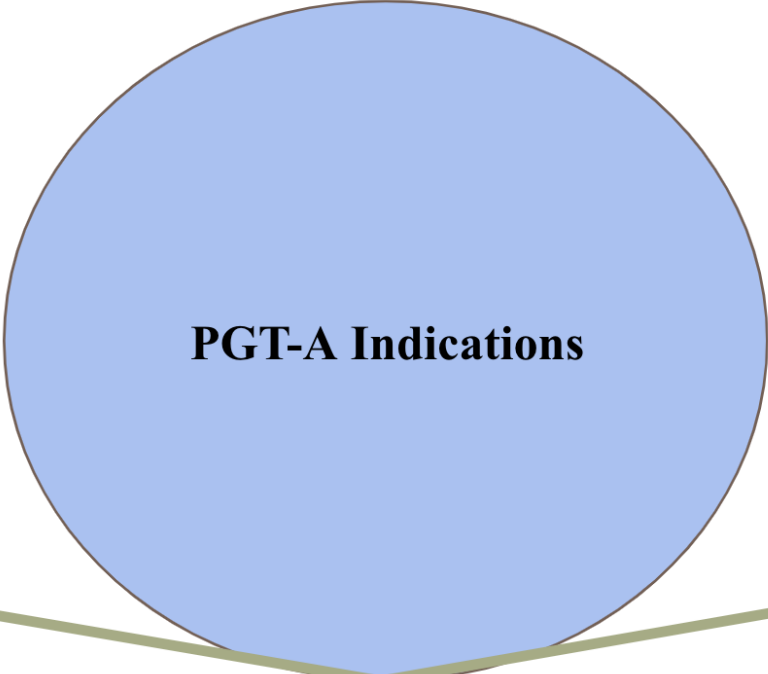


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Abstract

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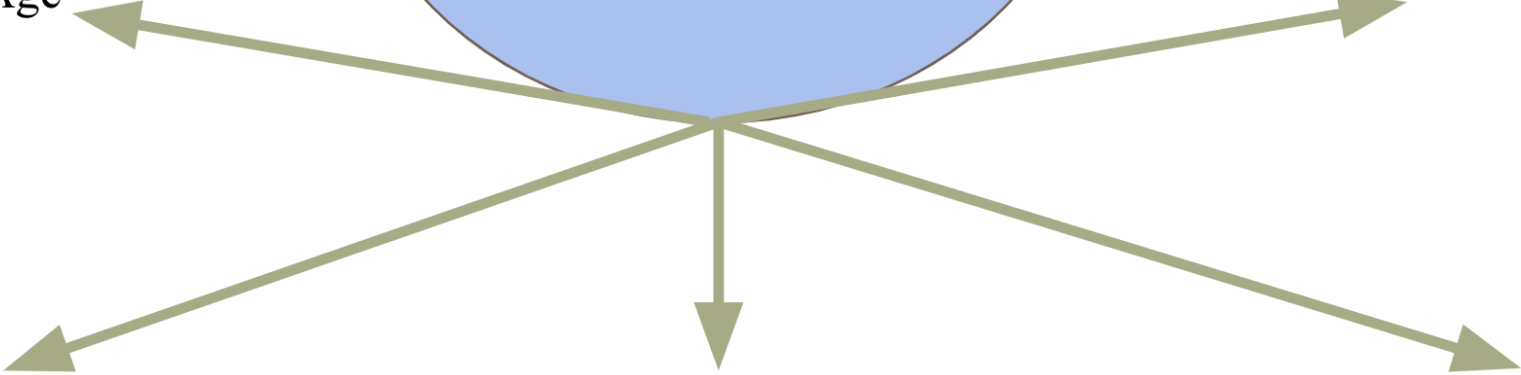
Advanced Maternal Age
(AMA)

Severe Male Factor
(SMF)

Recurrent Spontaneous
Abortion (RSA)



Recurrent Implantation
Failure (RIF)

Poor Embryo Quality (PEQ)

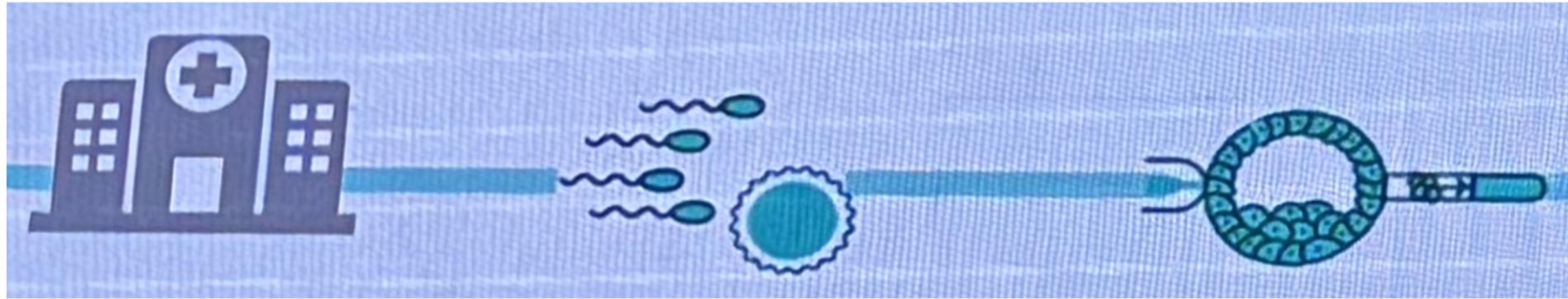


Aim of This Study

- ❑ To identify optimal indications for recommendation of PGT-A in daily practice with comparison of euploid/aneuploidy ratios
- ❑ To evaluate the pregnancy results of transferred euploid embryos according to PGT-A indications

	Euploid	Aneuploid
PGT-A test result		
Number of chromosomes in each cell	Correct	Incorrect
Likelihood of producing a healthy pregnancy	High	Very unlikely
Recommended for transfer	Yes	No

Materials and Method



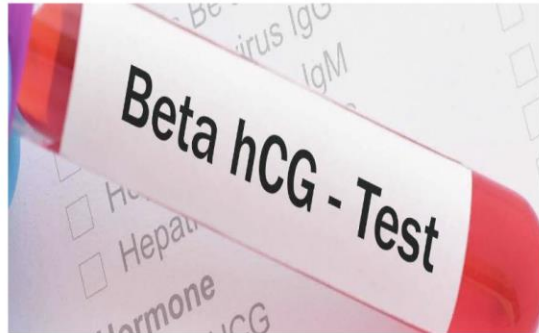
**Bezmialem IVF
clinic**

**2388 fertilized
oocytes**

492 Biopsies

- ❑ This retrospective designed single center study was carried out at IVF center of Bezmialem Vakif University Hospital between July 2020 and May 2023.
- ❑ A total of 203 women underwent IVF with PGT-A.
- ❑ The results of biopsies were reported as euploid, aneuploid and chaotic.

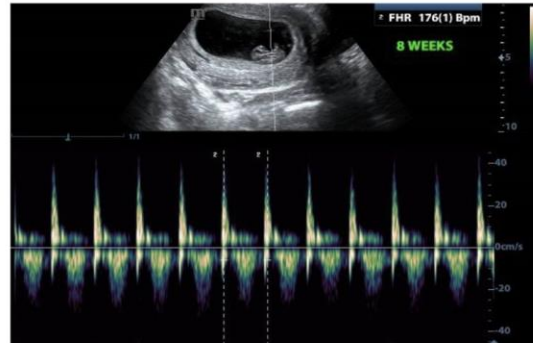
Materials and Method



Positive pregnancy test
(serum hCG level > 5 mIU/mL)



Miscarriage



clinical pregnancy
(fetal heartbeat- 12 weeks)



Ongoing pregnancy
(gestation 12-28 weeks)



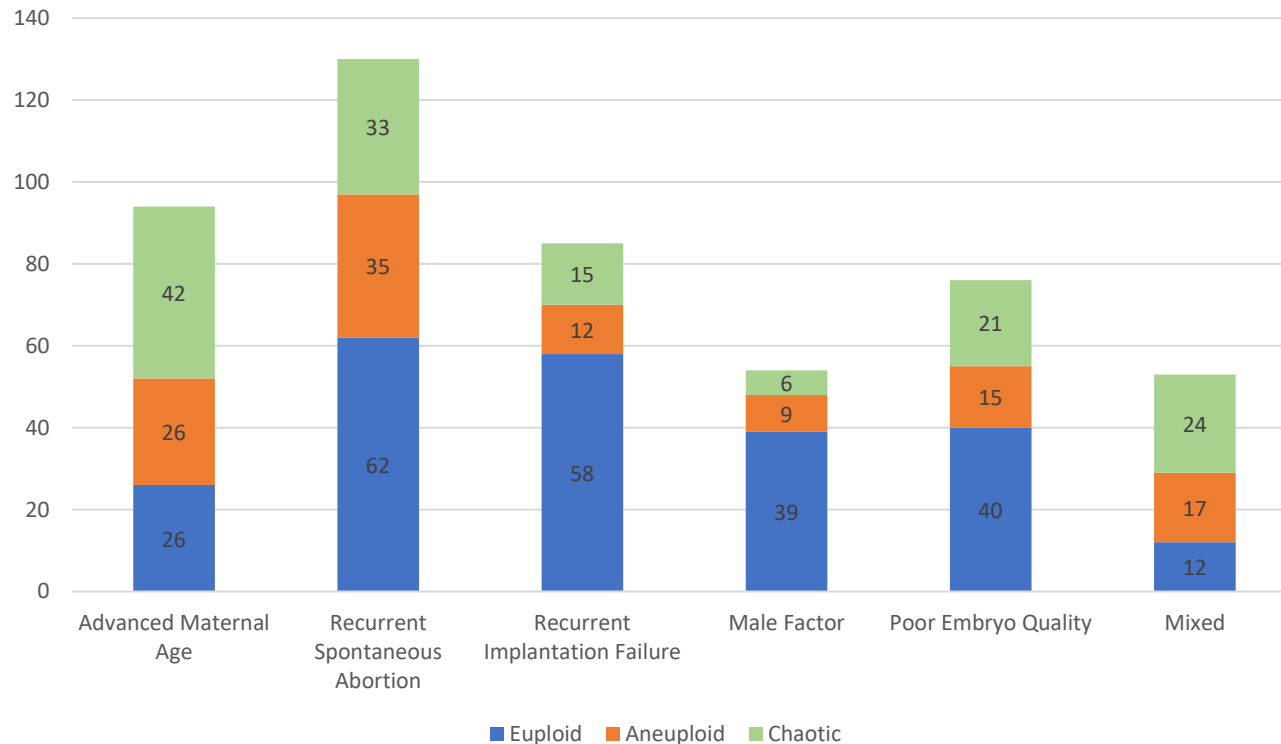
Results

Variables	
Female age (years)	34.47 ± 5.83 34 [20-47]
Male age (years)	36.5 ± 6.31 36 [20-59]
Previous IVF attempts	1.07 ± 1.25 1 [0-7]
Duration of infertility (years)	4.31 ± 3.08 4 [1-17]
Type of infertility	
Primary	97 (47.8%)
Secondary	106 (52.2%)

Indication of IVF	
Tubal factor	43 (21.2%)
Male factor	15 (7.4%)
Unexplained infertility	40 (19.7%)
Ovulatory	11 (5.4%)
Endometriosis	2 (1%)
Diminished ovarian reserve	48 (23.6%)
Mixed	44 (21.7%)
Indication of PGT-A	
Advanced maternal age	47 (23.2%)
History of recurrent spontaneous abortion	41 (20.2%)
History of recurrent implantation failure	32 (15.8%)
Serious male factor	18 (8.9%)
Poor embryo quality	40 (19.7%)
Mixed	25 (12.3%)

Table 1. Characteristics of patients

Results



- Euploid embryo ratios were significantly higher in RSA, RIF, male factor and poor embryo quality compared to AMA and mixed groups. ($p < 0,001$)
- Most frequent chaotic embryos were reported in AMA and mixed group. ($p < 0,001$)

Figure 1. Comparison of euploid/aneuploid ratios according to PGT-A indications

Results

Variables	Group 1 AMA* n=21 (%)	Group 2 History of RSA* n=30 (%)	Group 3 History of RIF* n=29 (%)	Group 4 Serious male factor n=16 (%)	Group 5 Poor embryo quality n=29 (%)	Group 6 Mixed n=7 (%)	p value
BHCG positive pregnancy	12 (57.1)	24 (80)	26 (89.7)	13 (81.3)	19 (65.5)	5 (71.4)	0.106
Clinical pregnancy	8 (38.1) ^a	22 (73.3) ^{a,b}	26 (89.7) ^b	13 (81.3) ^{a,b}	15 (51.7) ^a	5 (71.4) ^{a,b}	<0.001
Clinical miscarriage	2 (9.5)	4 (13.3)	2 (6.9)	1 (6.3)	1 (3.4)	-	0.836
Ongoing pregnancy	6 (28.6) ^a	17 (56.7) ^{a,b}	23 (79.3) ^b	11 (68.8) ^{a,b}	14 (48.3) ^a	5 (71.4) ^{a,b}	0.008
Live birth	6 (28.6)	17 (56.7)	19 (65.5)	10 (62.5)	14 (48.3)	3 (42.9)	0.151

- Clinical pregnancy rate and ongoing pregnancy rate are significantly higher in patients with RIF compared to AMA and poor embryo quality.

Table 2. Pregnancy rates of groups euploid embryo transferred according to PGT-A indications

Discussion-Conclusion

- ❑ PGT-A is a prime example of the advancements in medical science
- ❑ The effectiveness of PGT-A varies depending on the indication
- ❑ Advanced maternal age is associated with lower euploidy, clinical pregnancy, ongoing pregnancy
- ❑ PGT-A was beneficial in patients with RIF and severe male factor. Patients in these groups are recommended to consider undergoing PGT-A more to avoid IVF failure .
- ❑ However, its application should be considered based on individual patient needs and clinical situations.



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