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IS ADVANCED PATERNAL AGE ASSOCIATED WITH ALTERED MORPHOKINETICS IN EUPLOID EMBRYOS?

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Title:
IS ADVANCED PATERNAL AGE ASSOCIATED WITH ALTERED MORPHOKINETICS IN EUPLOID EMBRYOS?

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Preferred Presentation Type:
Oral or Poster

Study Type:
Retrospective Cohort Study (includes comparator groups)

Category - Subcategory(ies)s:
Infertility: Environmental Factors
Infertility: Outcomes

References:
1 Hanson B. Impact of APA on embryol and preg outcomes in euploid ET. F&S reports 2020; 1 2, 99-105

2 Lu XM. Effect of APA on repro outcomes in IVF cycles of non male factor infertility. Asian J Androl 2023; 25 2: 245-51

3 Friedenthal J. Clin implement of algo-based embryo selection is associated with improved preg outcomes in euploid ET. JARG 2021; 38 7: 1647-53

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Trainee: Yes

Abstract Category:
All Other Categories

Applied for the Resident In-Training Award

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Abstract Text:
OBJECTIVE: While the association between advanced maternal age and embryo quality is well established, the influence of advanced paternal age (APA) on embryo quality remains unclear [1,2]. This study explores the association between APA and morphokinetics in euploid embryos.

MATERIALS AND METHODS: This single center, retrospective study included couples who underwent in vitro fertilization with preimplantation genetic testing for aneuploidy from 2016-2024, in which maternal age was <35 years. Euploid embryos were categorized based on paternal age into four groups: <35 years (Control), 35-40 (Group 1), 40-50 (Group 2), and >50 (Group 3). All cycles utilized ICSI. Cycles that used surgically extracted sperm were excluded. The primary outcome was composite morphologic score, determined by a decision support tool based on the day of blastocyst biopsy, degree of expansion, and grades of inner cell mass (ICM) and trophectoderm [3]. Secondary outcomes included biopsy day and ICM grade. Chi-squared tests were used for comparative statistics. A generalized linear model calculated mean morphologic score with 95% CIs, adjusting for maternal age, body mass index, and treatment year. Logistic regression models with generalized estimating equations were used to examine associations between biopsy day, ICM grade, and paternal age.

RESULTS: A total of 8,084 euploid embryos were included. After adjusted analysis, composite morphologic score did not differ by paternal age: Controls (paternal age <35) 3.27 [3.23-3.30], Group 1 (35-40) 3.28 [3.22-3.33], Group 2 (40-50) 3.26 [3.20-3.36], Group 3 (>50 years) 3.31 [3.05-3.56] (p=0.98). The proportions of Day 5, 6, and 7 blastocysts were similar across paternal age groups, as were proportions of ICM grades A, B, and C (Table 1). Compared to Controls, odds of producing a Day 5 blastocyst were comparable in Group 1 (OR 0.94 [0.83-1.08]), Group 2 (OR 0.96 [0.78-1.19]), and Group 3 (OR 1.07 [0.67-1.71]). Odds of an A-graded ICM were also similar in Group 1 (OR 0.96 [0.84-1.09]), Group 2 (OR 0.91 [0.74-1.12]), and Group 3 (aOR 0.97 [0.64-1.48]) compared to <35 year Controls.

CONCLUSIONS: Among couples with maternal age <35 years, there was no difference in composite morphologic score of euploid embryos across paternal age groups. Paternal age was not associated with individual score parameters, including day of blastocyst biopsy and ICM grade.

IMPACT STATEMENT: Advanced paternal age does not alter embryo morphokinetics or impair efficient blastulation, indicating that integrity of paternal genome activation is maintained.

Table 1. Blastocyst biopsy day and ICM grade by paternal age

	<35 yrs	35 - 40 yrs	40 - 50 yrs	>50 yrs	P value
Biopsy Day					
5 (%)	55.2	54.5	55.2	59.5	0.80
6 (%)	39.2	40.0	40.4	32.1	0.47
7 (%)	5.6	5.5	4.4	8.3	0.43
ICM Grade					
A (%)	63.4	63.0	61.7	65.5	0.82
B (%)	27.1	27.5	28.7	27.4	0.87
C (%)	9.5	9.5	9.6	7.1	0.91

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Biographical Sketch Early success, marked by his first publication in CELL at Harvard Medical School, inspired Joseph to continue his research endeavors in reproductive endocrinology and infertility. Joseph has been with Reproductive Medicine Associates of New York since 2011. Joseph has authored over 400 peer-reviewed abstracts & manuscripts. Passionate about development, he cultivates relationship with investors & entrepreneurs to advance reproductive endocrinology & infertility care.
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