



Total Motile Sperm Count and Laboratory Outcomes in Donor ICSI: An Age-Stratified Cohort Study

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INTRODUCTION

Why does this matter?

- Donor sperm vials labeled for ICSI often contain $\geq 10M$ motile sperm
- Higher-count vials cost more
- Evidence supporting higher thresholds is limited
- Female age strongly influences ART outcomes

Clinical Question

Is there a minimum TMSC threshold for donor ICSI — and does it differ by age?

OBJECTIVE

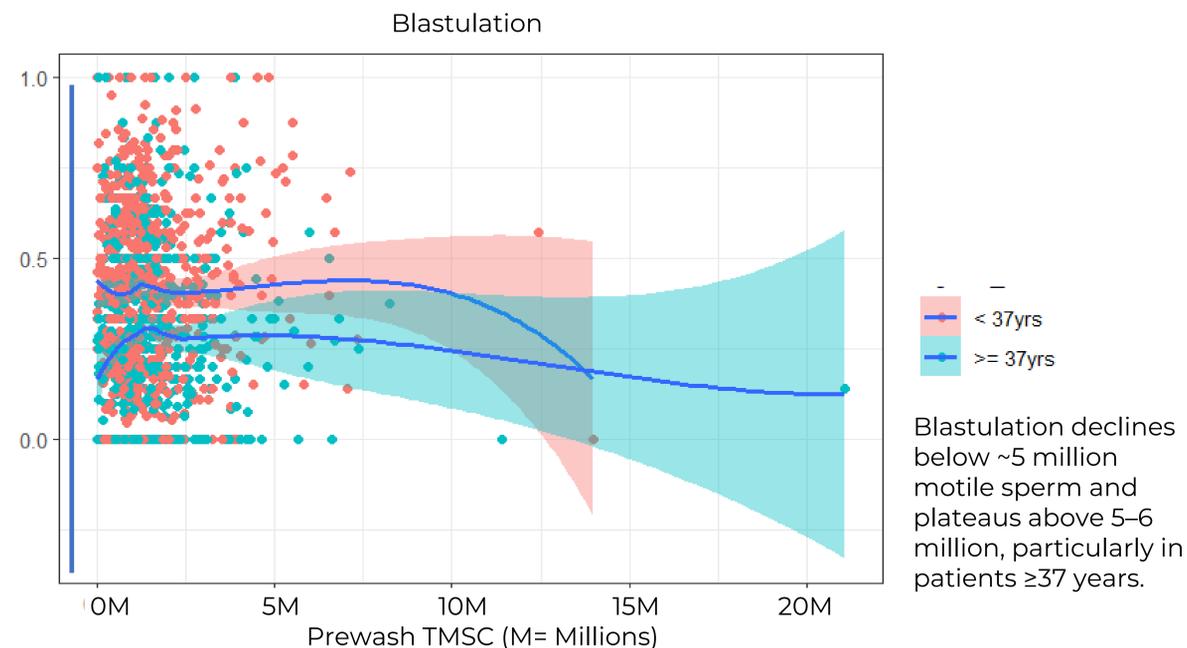
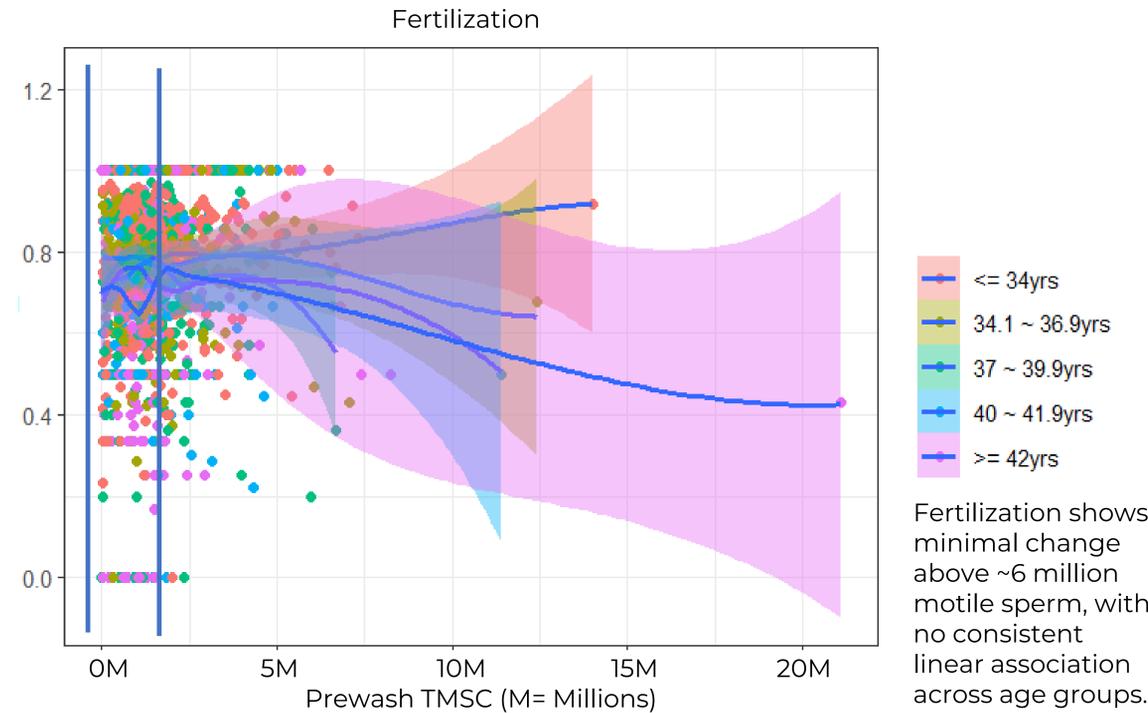
To identify whether a **minimum TMSC** threshold exists for donor ICSI and to evaluate whether this threshold differs across female age groups.

METHODS

- **Design**
 - Retrospective cohort
 - Multi-site U.S. fertility network
 - Jan 2024 – Apr 2025
- **Population**
 - 1,416 donor ICSI cycles
 - 1,159 patients
- **Primary Outcomes**
 - Fertilization rate
 - Blastulation rate
- **Analysis**
 - GEE Poisson models
 - Adjusted for age, sperm bank, cycle number
 - Age \times TMSC interaction tested
 - LOWESS curves and trend analysis for non-linearity

RESULTS

LABORATORY OUTCOMES PLATEAU ABOVE 5-6 M MOTILE SPERM



COHORT SNAPSHOT

Median age	37 Years
Median TMSC	12.7 Million
Mean fertilization rate	75%
Mean blastulation rate	35%

FEMALE AGE = STRONGEST PREDICTOR OF BLASTULATION

Age Group	Adjusted RR (95% CI)	P-value
≤ 34 yrs	1.00 (Ref)	-
34–36.9 yrs	0.85 (0.76–0.96)	< 0.01
37–39.9 yrs	0.79 (0.72–0.86)	< 0.01
40–41.9 yrs	0.68 (0.59–0.78)	< 0.01
≥ 42 yrs	0.45 (0.40–0.52)	< 0.01

CLINICAL IMPLICATIONS

- ICSI outcomes appear optimized once ~ 5 –6 million motile sperm are available.
- Purchasing higher-count vials ($> 6M$) may not provide additional laboratory advantage.
- When lower-cost vials meet the ≥ 5 –6M threshold, they are likely sufficient for ICSI.
- Counseling should emphasize threshold adequacy rather than “higher is better.”

TAKE-HOME MESSAGE

For donor ICSI cycles, laboratory outcomes improve up to ~ 5 –6 million motile sperm and do not increase above this range.

Higher-concentration ICSI vials ($> 6M$) did not demonstrate additional fertilization or blastulation benefit.

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