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Association between advancing paternal age and pregnancy outcomes in intrauterine insemination cycles

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PURPOSE & OBJECTIVES

- Pregnancy rates are known to decline with advancing maternal age, but the effect of advanced paternal age is less clear.
- There are conflicting data on the association between paternal age and intra-uterine insemination (IUI) outcomes.
- **Our aim was to evaluate the association between paternal age and pregnancy outcomes among patients undergoing infertility treatment with IUI**

MATERIAL & METHODS:

- **Study design:** Retrospective cohort study.
- **Participants:** Patients undergoing their first clomiphene or letrozole IUI cycle at our center between 2010-2022. Donor sperm cycles were excluded.
- **Study group:** IUI performed with sperm obtained from male aged ≥ 40 years.
- **Control group:** IUI performed with sperm obtained from male aged < 40 years.
- **Primary outcome:** Ongoing pregnancy rate, defined as the proportion of IUI cycles resulting in viable intrauterine pregnancy at approximately 8 weeks gestation.
- **Statistical analysis:** Modified Poisson regression models with robust error variance, adjusted a priori for female age and post-wash Total Motile Sperm Concentration (TMSC) < 9 million, were used to estimate the relative risk (RR) with 95% confidence interval (CI) of the pregnancy outcomes. A subgroup analysis was performed stratified by SART female age categories to further control for differences in female age between the paternal age groups.

RESULTS

Table: Patient Characteristics

| Characteristics | Study group Paternal age ≥ 40 years (n= 781) | Control group Paternal age < 40 years (n= 2459) |
|---|---|---|
| Paternal age (years) Mean \pm SD | 43 \pm 4 | 37.4 \pm 3.5 |
| Maternal age (years) Mean \pm SD | 34.1 \pm 3.4 | 33 \pm 3.7 |
| AMH level (ng/mL) | 3.3 | 4.86 |
| Mean sperm concentration X 10 ⁶ | 79.98 | 83.76 |
| Proportion of Clomiphene cycles | 75% (n=586) | 66.5% (n=1636) |

KEY POINTS

- **Ongoing pregnancy per IUI cycle was not significantly different in the paternal age < 40 group [402 (16.3%)] compared to the paternal age ≥ 40 group [116 (14.9%).]**
- No significant differences observed for pregnancy rate and miscarriage rate.
- In a subgroup analysis stratified by SART female age categories, while pregnancy rates decreased with each increasing female age category, within each female age category there were no significant differences in pregnancy, miscarriage, or ongoing pregnancy rate between patients with a paternal age < 40 and paternal age ≥ 40 years.

CONCLUSIONS

- Among patients undergoing their first clomiphene or letrozole IUI cycle, paternal age was not significantly associated with pregnancy outcomes, after adjusting for female age and TMSC.
- Female age remains the primary exposure variable associated with chance of a successful outcome.
- Patients should be counseled that paternal age is not associated with pregnancy outcome in IUI cycles and therefore is not a variable that should be considered when deciding how to proceed with fertility treatment.

REFERENCES

1. Belloc S, Cohen-Bacrie P, Benkhalifa M, et al. Effect of maternal and paternal age on pregnancy and miscarriage rates after intrauterine insemination. *Reprod Biomed Online*. 2008; 17(3): 392-397.

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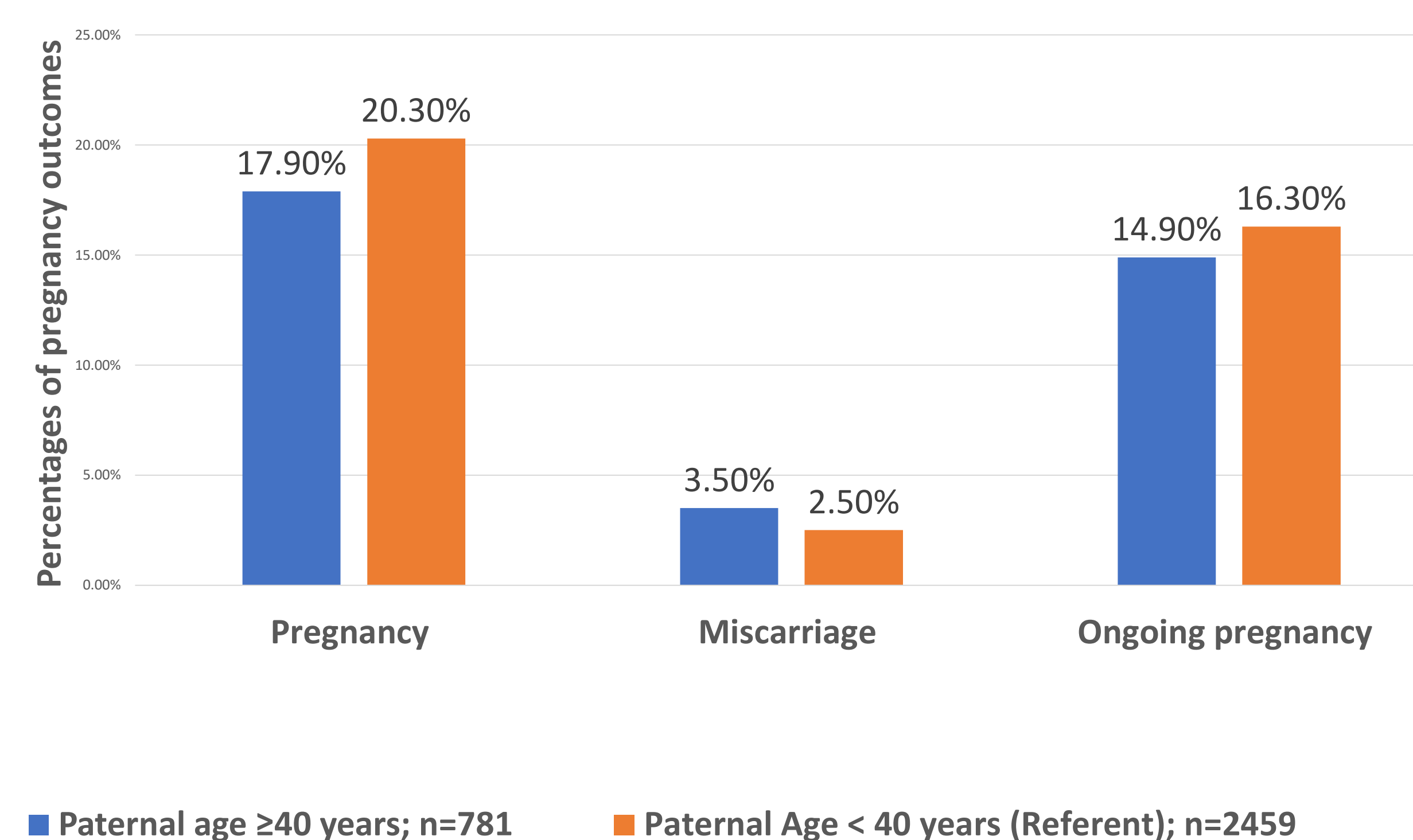


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Comparison of IUI pregnancy outcomes, based on paternal age.



Comparison of ongoing pregnancy rate between patients with a paternal age < 40 and paternal age ≥ 40 years, stratified by SART female age categories

