cIVF and ICSI result in comparable live birth rates following euploid embryo transfer in non-severe male factor cycles

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Introduction

ICSI is widely used in non-severe male factor cycles despite limited evidence of clinical benefit over cIVF.

Recent studies indicate that ICSI does not improve live birth rates compared with cIVF. Moreover, the widespread use of ICSI has raised concerns regarding potential long-term implications for offspring.

To accurately assess the clinical efficacy of cIVF, restricting analysis to euploid embryos is particularly relevant. However, downstream reproductive outcomes according to insemination method from PGT-A cycles remain insufficiently explored.

Although live birth is a patient-level outcome, sibling-oocyte allocation minimizes biological variability at the embryo origin, which is particularly relevant in this context.

Materials and Methods

Observational study conducted at a single IVF centre between June 2017 and October 2024, including 764 seFET cycles derived from cIVF or ICSI in cycles with sibling oocytes inseminated by both methodologies. The median number of sibling oocytes inseminated per cycle was 4 [3–7] by cIVF and 7 [4–10] by ICSI. Multivariable logistic regression was performed among clinical pregnancies with known outcomes, adjusting for female age, BMI and embryo quality.

Conclusion

These findings support cIVF as an effective option in PGT-A cycles in non-severe male factor, enabling individualized, evidence-based insemination with balanced laboratory resource use and comparable clinical outcomes.

Results

Median female age (35.0 vs 34.0 years, p=0.229), BMI (26.5 vs 25.9 kg/m², p=0.148), previous abortions (0 [0–1] vs 1 [0–2], p=0.581), HRT use (56.4% vs 54.9%, p=0.707), good-quality embryo transfer (85.4% vs 87.2%, p=0.512), were similar between transfers derived from cIVF versus ICSI inseminated oocytes. The number of IVF oocytes (4 [3–7] vs 4 [3–6], p=0.657) and of ICSI oocytes (7 [4–10] vs 7 [5–11], p=0.403) were similar between cases where embryos transferred derived from cIVF and ICSI, respectively.

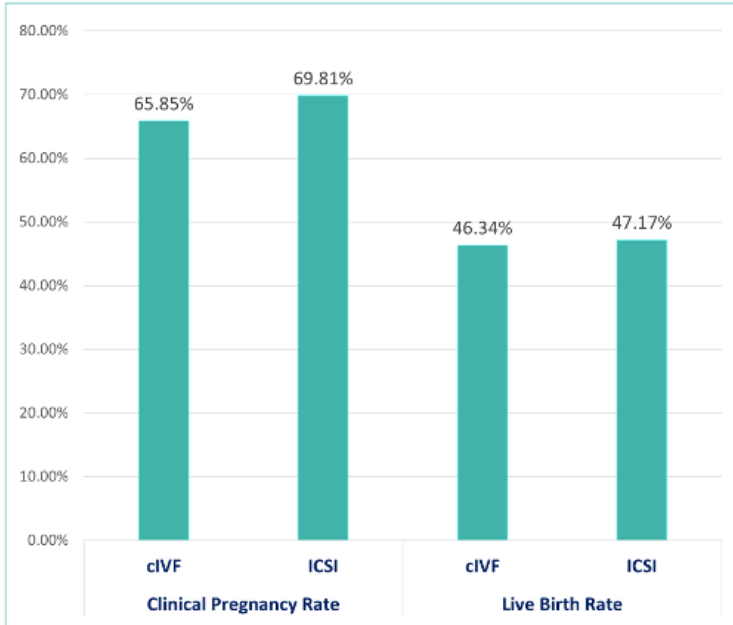

Figure 1. Clinical pregnancy (cIVF: 189/287 vs. ICSI: 333/477) and Live birth (cIVF: 133/287 vs. ICSI: 225/477) were similar between insemination methods (P>0.05).

The clinical pregnancy and live birth rates were similar between cIVF and ICSI transferred embryos (Figure 1).

Insemination method was not independently associated with live birth (Table 1). Embryo quality was the strongest predictor of live birth, with good-quality embryos demonstrating nearly two-fold higher odds of live birth compared with poorer-quality embryos. BMI showed a borderline inverse association with live birth. Sensitivity analyses including previous miscarriage did not alter the results.

Table 1. Multivariable logistic regression for live birth among clinical pregnancies with known outcome

Variable	Adjusted OR (95% CI)	p-value
ICSI vs IVF technique	0.76 (0.49–1.17)	0.222
Female age (per year)	0.99 (0.95–1.03)	0.709
BMI (per kg/m²)	0.96 (0.92–1.00)	**0.061**
Top/Good vs Fair/Poor embryo quality	1.94 (1.07–3.45)	**0.026**

Note. Logistic regression with live birth (Delivered) as the outcome (1 = live birth, 0 = other outcomes) among clinical pregnancies with known final status (Pending, Unknown, Ongoing, and TOP excluded). Covariates were insemination technique (Classic IVF vs ICSI; IVF reference), female age (years), BMI (kg/m²), and embryo quality (Good vs Poor). Odds ratios are adjusted for all listed covariates, with 95% confidence intervals in parentheses.

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