

INTRAMUSCULAR PROGESTERONE VERSUS COMBINED ORAL AND VAGINAL LUTEAL SUPPORT IN SINGLE EUPLOID EMBRYO TRANSFERS

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Objective

Luteal support via exogenous progesterone is crucial for endometrial preparation in programmed single euploid embryo transfers (SEET) cycles. Intramuscular (IM) progesterone is commonly used due to stable serum progesterone levels that are associated with higher rates of live birth compared to oral or vaginal administration. This study aims to assess programmed SEET outcomes in patients who either used combined oral and vaginal (POPV) versus IM progesterone.

Design

Retrospective cohort study

Materials & Methods

- This study included patients who underwent first programmed SEET with POPV or IM progesterone for luteal support without switching routes at a single academic fertility center between 2012 and 2024.
- POPV group: 200 mg oral progesterone TID + 100 mg vaginal progesterone BID
- IM group: 50 mg IM progesterone daily
- Exclusion criteria: endometrial lining < 7 mm before starting progesterone or oocyte age ≥ 40 years
- Primary outcome: ongoing pregnancy/live birth
- Secondary outcomes: positive pregnancy test, clinical pregnancy, clinical pregnancy loss, serum progesterone levels one day prior and two days after SEET
- Group comparisons were performed using chi-square and Kruskal-Wallis tests.
- Multivariate logistic regression with generalized estimating equations adjusted for patient age, oocyte age, BMI, endometrial thickness, day of embryo biopsy, and embryo quality
- Two-sided $p < 0.05$ considered statistically significant

Results

Table 1. Patient Demographics

	IM (n = 5,094)	POPV (n = 858)
Age (years)	35.8 (33.3 - 38.2)	35.9 (33.1 - 38.3)
Oocyte Age (years)	35.1 (32.5 - 37.4)	35.1 (32.1 - 37.3)
BMI (kg/m ²)	23.2 (21.0 - 26.6)	22.6 (20.6 - 25.4)
AMH (ng/mL)	2.6 (1.4 - 4.3)	2.8 (1.5 - 4.8)

Results written as median (IQR) for non-parametric variables

Figure 1. Serum Progesterone Levels Before and After ET

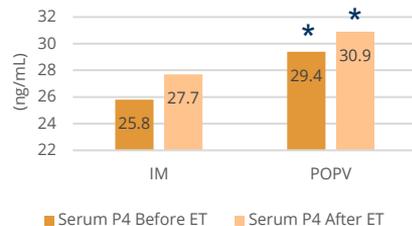
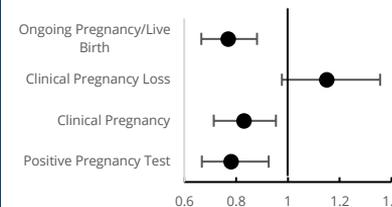


Figure 2. Odds Ratio of Pregnancy Outcomes for POPV Progesterone



- General demographics were clinically comparable between the two groups (Table 1).
- Endometrial thickness was also similar between the IM progesterone [9 (8-10) mm] and POPV [9 (8-10) mm] groups.
- Serum progesterone levels were significantly higher in the POPV group compared to the IM group both before and after ET (Figure 1), despite POPV being associated with lower pregnancy outcomes.
- After adjusting for confounders, patients using POPV progesterone had a significantly lower likelihood of a positive pregnancy test [74.9 vs. 78.5%; aOR 0.79 (0.67-0.93)], clinical pregnancy [62.6 vs. 66.6%; aOR 0.83 (0.71-0.95)], and ongoing pregnancy/livebirth [51.8 vs. 57.5%; aOR 0.77 (0.67-0.88)].
- The odds of clinical pregnancy loss were similar between POPV and IM progesterone groups [12.1 vs. 11.6%; aOR 1.09 (0.89-1.35)]. (Figure 2).

Conclusions

- IM progesterone was associated with higher rates of ongoing pregnancy and live birth in programmed SEET cycles.
- POPV progesterone provides reassuring outcomes and is a viable alternative for patients who are not candidates for IM administration.