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# P-237 Does PPOS improve oocyte yield at the cost of DNA Integrity? Clinical implications from a comparative study with the antagonist protocol

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## Introduction

Progestin-Primed Ovarian Stimulation (PPOS) has emerged as a flexible alternative to GnRH antagonist protocols, offering similar pregnancy outcomes and improved cycle scheduling. However, data remain limited regarding its impact on oocyte quality, efficiency of euploid conversion, and potential DNA damage. Clarifying whether PPOS enhances oocyte yield without compromising genetic integrity is essential for optimizing individualized stimulation strategies.

## Study Question

Does Progestin-Primed Ovarian Stimulation (PPOS) improve mature oocyte yield and euploid conversion rates compared to the antagonist protocol, and is it associated with an increased risk of oocyte DNA damage?

## Methods

This retrospective cohort study was conducted at Ovo Clinic, a university-affiliated private fertility center in Montreal, Canada. A total of 389 IVF cycles with PGT-A performed between 2024 and May 2025 were included, comparing 39 PPOS cycles to 350 antagonist cycles under identical clinical and laboratory conditions. Patients were assigned to either the PPOS or antagonist group. Baseline characteristics and outcome measures included age, AMH, mature oocyte yield, euploidy rates, and aneuploidy profiles. Quantitative variables were compared using parametric or non-parametric tests based on distribution, and categorical variables using chi-square or Fisher's exact test. A p-value < 0.05 was considered statistically significant.

Table 1 . Baseline Characteristics of Patients Undergoing IVF with PGT-A in PPOS and Antagonist Protocols

| | All patients n=389 | PPOS protocol n=39 | Antagonist protocol n=350 | P-value |
|---|---|---|---|---|
| Age (years) | 37.8 ± 3.5<br>39.0 (36.0, 40.0) | 37.7 ± 2.9<br>38.0 (36.0, 40.0) | 37.8 ± 3.6<br>39.0 (36.0, 40.0) | 0.37 |
| AMH (ng/ml) | 2.9 ± 2.6<br>2.1 (1.2, 3.9) | 2.6 ± 2.0<br>2.1 (1.2, 3.4) | 2.9 ± 2.7<br>2.1 (1.2, 3.9) | 0.73 |

Table 2. Distribution of Embryo Genetic Diagnoses Following PGT-A in PPOS and Antagonist Protocols

| | All patients n=389 | PPOS protocol N=39 | Antagonist protocol n=350 | P-value |
|---|---|---|---|---|
| **Total number of biopsied embryos** | 1479 (100%) | 170 (100%) | 1309 (100%) | |
| Euploids | 675 (45.6%) | 79 (46.5%) | 596 (45.5%) | 0.87 |
| Mosaics | 137 (9.3%) | 11 (6.5%) | 126 (9.6%) | 0.21 |
| Segmental aneuploids | 61 (4.1%) | 8 (4.7%) | 53 (4.0%) | 0.68 |
| Aneuploids | 585 (39.6%) | 69 (40.6%) | 516 (39.4%) | 0.80 |
| Failed | 19 (1.3%) | 2 (1.2%) | 17 (1.3%) | >0.99 |

Table 3. Ovarian Response and Embryo Development Outcomes in PPOS and Antagonist Protocols

| | All patients n=389 | PPOS protocol n=39 | Antagonist protocol n=350 | P-value |
|---|---|---|---|---|
| Mature oocytes (MII) | 11.7 ± 6.9<br>10.0 (7.0, 15.0) | 11.9 ± 9.1<br>10.0 (6.0, 14.0) | 11.7 ± 6.7<br>10.0 (7.0, 15.0) | 0.57 |
| Blastocysts | 6.5 ± 4.3<br>6.0 (3.0, 9.0) | 7.1 ± 5.9<br>6.0 (3.0, 9.0) | 6.5 ± 4.1<br>6.0 (3.0, 8.0) | 0.96 |
| Total number of MII | 4554 (100%) | 464 (100%) | 4090 (100%) | |
| Total number of blastocysts | 2540 (55.8%) | 279 (60.1%) | 2261 (55.3%) | <0.05 |

Values are presented as counts with corresponding percentages, or as mean ± standard deviation and median (interquartile range).

## Results

Baseline characteristics were similar between groups. No significant differences were observed in patient age (median [IQR]: 38.0 [36.0–40.0] in PPOS vs. 39.0 [36.0–40.0] years in the antagonist group; p = 0.37) or AMH levels (2.1 [1.2–3.4] vs. 2.1 [1.2–3.9] ng/mL; p = 0.73).

Embryo genetic results revealed a slightly lower rate of mosaic embryos in the PPOS group compared to the antagonist group (6.5% vs. 9.6%; $p = 0.21$), and a slightly higher incidence of segmental aneuploidies (4.7% vs. 4.0%; $p = 0.68$), though neither difference reached statistical significance. Overall euploid and aneuploid rates were comparable between protocols (46.5% vs. 45.5% and 40.6% vs. 39.4%, respectively).

Regarding ovarian response and embryo development, the median number of mature oocytes retrieved, and blastocysts were similar between the two groups (p=0.57 and 0.96, respectively). The proportion of MII that developed into blastocysts was significantly higher in the PPOS group compared to the antagonist group (60.1% vs 55.3%, p<0.05).

## Conclusion

Despite similar baseline characteristics and comparable rates of euploid and aneuploid embryos, PPOS was associated with a significantly higher blastulation efficiency, as a greater proportion of MII oocytes developed into blastocysts. These findings suggest that PPOS may enhance oocyte-to-blastocyst conversion without negatively impacting chromosomal integrity. However, the relatively small number of patients in the PPOS group limits the strength of these observations, and larger studies are needed to confirm these results and evaluate their clinical significance.


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