# A Comparative Analysis of PPOS and Antagonist Protocols in GnRH Agonist Trigger Cycles.

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## Introduction

Progestin-primed ovarian stimulation (PPOS) protocols have emerged as a promising alternative to antagonist protocols, offering similar pituitary suppression with added convenience. However, the data on GnRH agonist trigger outcomes in PPOS cycles remain limited. This study evaluates whether outcomes differ between PPOS and GnRH antagonist protocols when a GnRH agonist is used for final oocyte maturation, addressing concerns over LH responsiveness.

## Materials and Methods

Retrospective cohort study including 795 stimulation cycles (May 2015 –September 2024) at a tertiary IVF center. All cycles used GnRH agonist (Gonapeptyl 0.3 mg s.c.) for final oocyte maturation. 718 cycles followed GnRH antagonist protocol (cetrorelix or ganirelix, 0.25 mg/day), and 77 used a PPOS protocol (dydrogesterone, 30 mg/day, initiated with gonadotropins). Stimulation started on cycle day 2/3. Exclusion criteria: BMI >40kg/m², ovarian pathology (surgery, endometriosis, cysts), estradiol priming or oral contraceptive use, testicular sperm extraction. Ethical approval was obtained from the Research Ethics Committee.

## Results

No significant differences were observed between groups regarding Follicle-Oocyte Index (FOI), complex-cumulus-oocytes (COC's) and Metaphase II (MII) retrieved. After logistic regression analysis adjusted for age, BMI, AMH, AFC and basal FSH, the protocol was not associated with maturation rate [MII per COC retrieved; OR:0.93 (CI:0.83-1.04, p=0.22)], MII yield [OR:1.03 (CI:0.93-1.14, p=0.57)], fertilization rate [2PN per MII; OR:0.99, CI: 0.86-1.15, p=0.89], blastocyst yield [OR:1.09 (CI:0.92-1.30, p=0.33)], blastulation rate [blastocyst per 2PN; OR:1.16 (CI:0.99-1.36, p=0.08)], or euploid rate [euploid blastocyst per biopsied blastocyst; OR:1.11 (CI:0.89-1.40, p=0.36)].

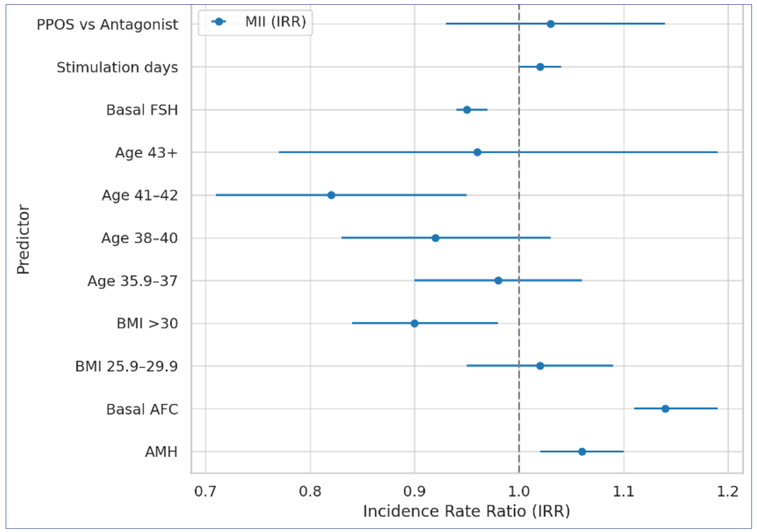


**Figure 1.** Multivariate Analysis of Predictors for MII Yield. Incidence Rate Ratios (IRR).

**Table 1.** Regression analysis, adjusted for age, BMI, AFC, and basal FSH. Antagonist protocol as reference.

| Protocol Ref: antagonist | PPOS **OR (CI)** | *p* |
|---|---|---|
| Fertilization (2PN per MII) | 0.99(0.86 – 1.15) | 0.89 |
| Blastulation (per 2PN) | 1.16(0.99-1.36) | 0.08 |
| Blastocyst yield (per MII) | 1.09(0.92-1.30) | 0.33 |
| Euploidy rate | 1.11(0.89-1.40) | 0.36 |

## Conclusion

**No significant differences were found in oocyte yield, maturation, fertilization, blastocyst development, or euploid rates between PPOS and antagonist protocols with GnRH agonist trigger. These findings support the use of PPOS as a reliable alternative to GnRH antagonist protocols for ovarian stimulation. Larger prospective studies with hormonal profiling are needed to confirm and optimize these protocols.**

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