



# A NOVEL AND UNIFYING APPROACH TO PREDICT ENDOMETRIAL RECEPTIVITY: SIGNIFICANCE OF HORMONAL RATIOS TO OOCYTE NUMBER IN IN-VITRO FERTILISATION



RACICOT M-H, DEAN NL, ANTAKI R, MENARD S, KADOCH IJ - DEPARTEMENT OF OBSTETRICS AND GYNECOLOGY, CHUM ST-LUC; UNIVERSITÉ DE MONTRÉAL; OVO CLINIC (OVO FERTILITY), MONTREAL, QC, CANADA

## Introduction

Elevation of Pg > 0.9 ng/mL on the day of hCG

- Used to define premature luteinisation in long agonist protocols
  - But has been described with comparable LH values;
  - Influence on implantation rate controversial;
    - Negative (Schoolcraft '91, Mio '92, Fanchin '93)
    - Positive or no effect (Silverberg '91, méta-anal Venetis 2007, Givens '94, Hofmann '96, Abuzeid '96, Lindheim '99, Lindheim '99)
- Pg/E2 > 1 ratio also proposed
  - Antagonist protocol in normal responders - premature ovulation resulting in fewer oocytes;
  - Long agonist protocol in poor responders - lower implantation rate related to poor oocyte quality;
- No study ever correlated these hormonal values with the number of mature oocytes

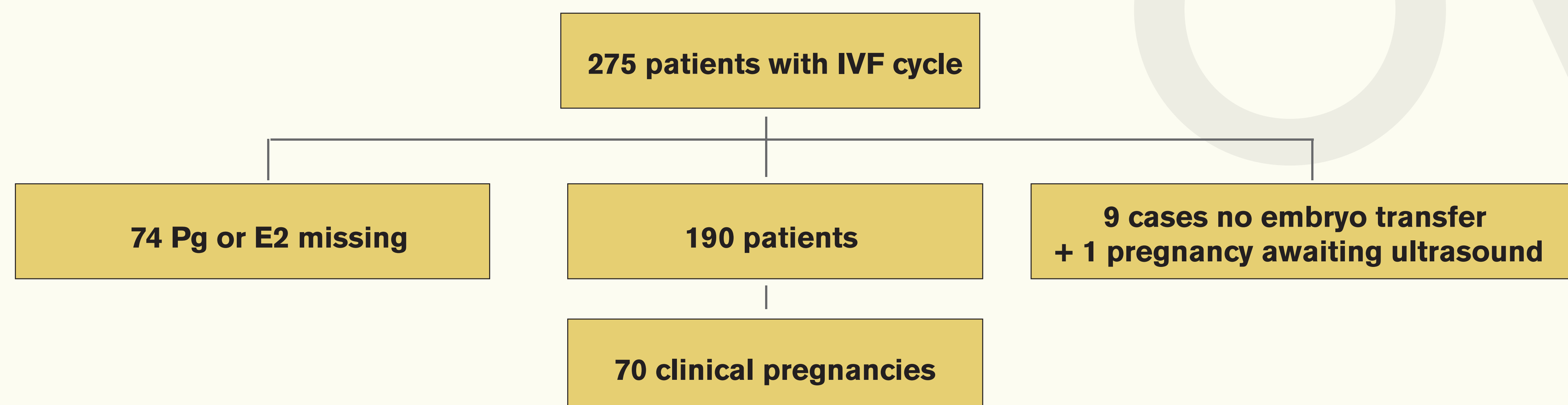
## Objective

To define a hormonal ratio that could help determine the endometrial receptivity in any type of cycle, regardless of ovarian response, etiology of infertility or stimulation protocol.

## Materials and methods

- Prospective observational study at OVO FERTILITY
  - 275 IVF cycles from September 2009 to May 2010;
  - E2(pg/mL) and Pg(ng/mL) measured on day of hCG;
  - Pg/E2 ratio(Pg ng/mL x 1000/E2 pg/mL), Pg/mature oocyte, Pg/E2 per mature oocyte calculated;
  - Evaluation of impact of these hormonal ratios on clinical pregnancy rate and implantation rate;

## Population

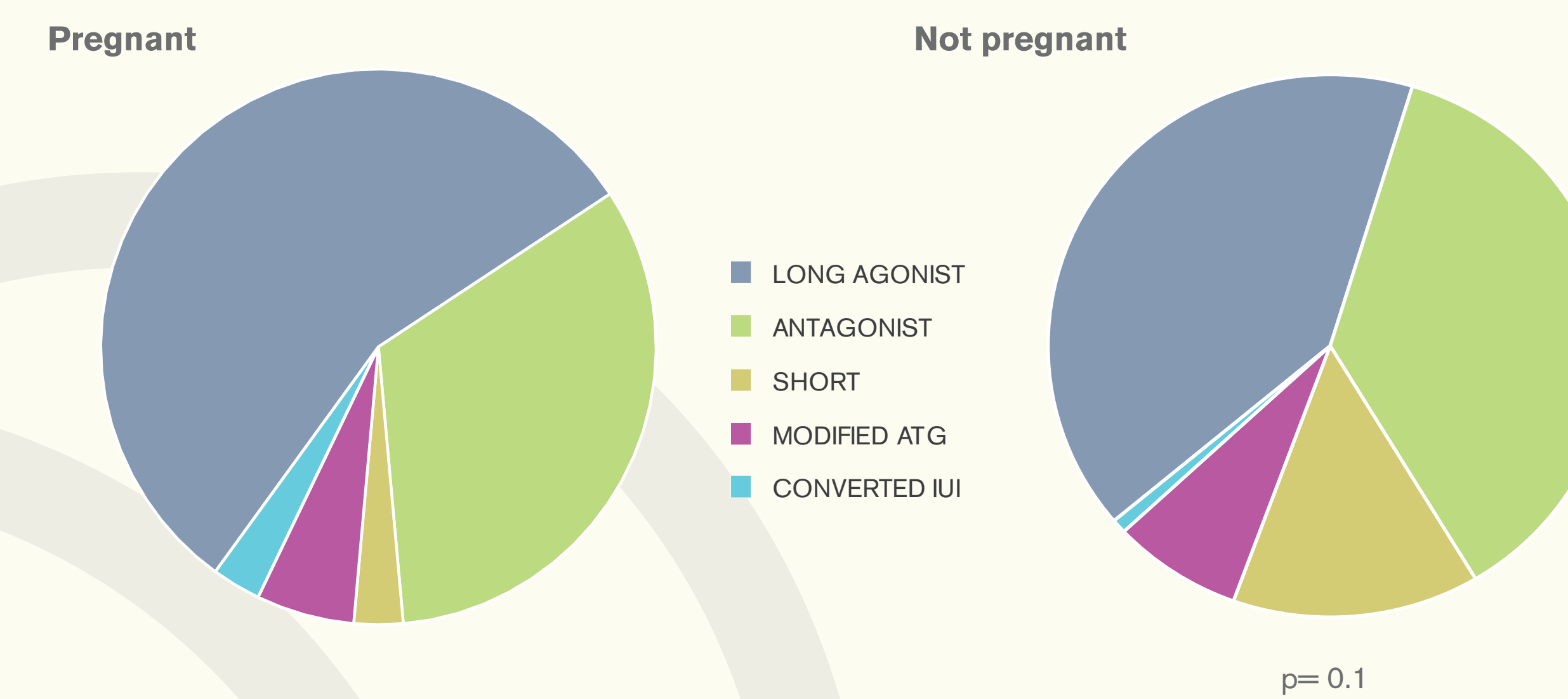


## Demographic data

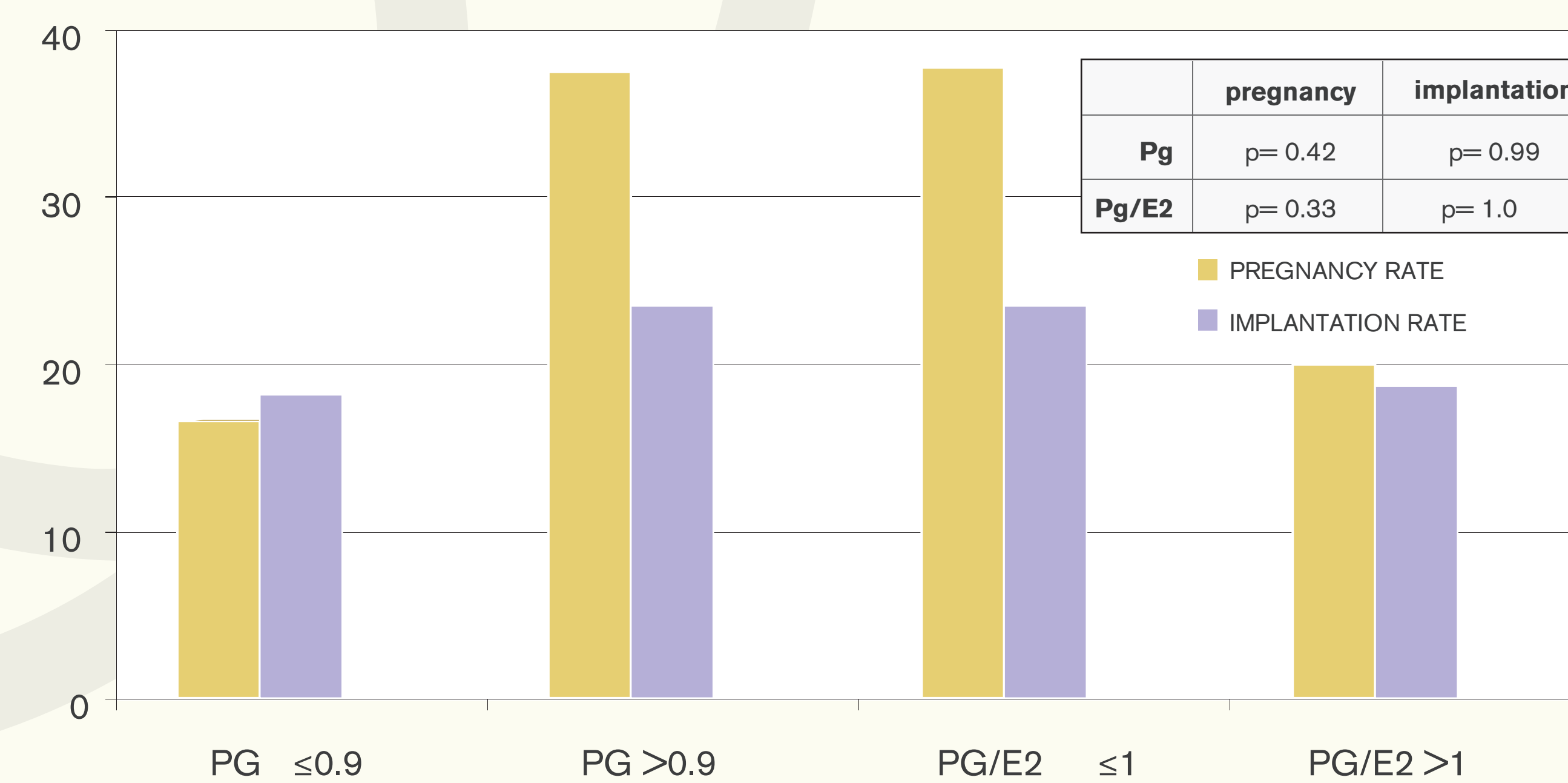
	Pregnant	Not pregnant	p
Number of cycles	70	120	
Age	32.84 ± 3.8	36.09 ± 4.35	1.0 <sup>1</sup>
Mean E2 day of hCG	9948 ± 5449	9141 ± 6212	0.35 <sup>1</sup>
Mean Pg day of hCG	3.08 ± 1.49	3.57 ± 2.48	0.09 <sup>1</sup>
FIV (standard)	22(31.4%)	29(24.2%)	0.63 <sup>2</sup>
ICSI	36(51.4%)	74(61.7%)	0.63 <sup>2</sup>
FIV/ICSI(50/50)	12(17.1%)	17(14.1%)	0.63 <sup>2</sup>
# oocytes MII	11.29 ± 5.43	8.51 ± 5.47	0.0009 <sup>1</sup>
Fertilisation rate/oocyte	58.5%	60.8%	0.33 <sup>2</sup>

1: student t test 2: Chi square

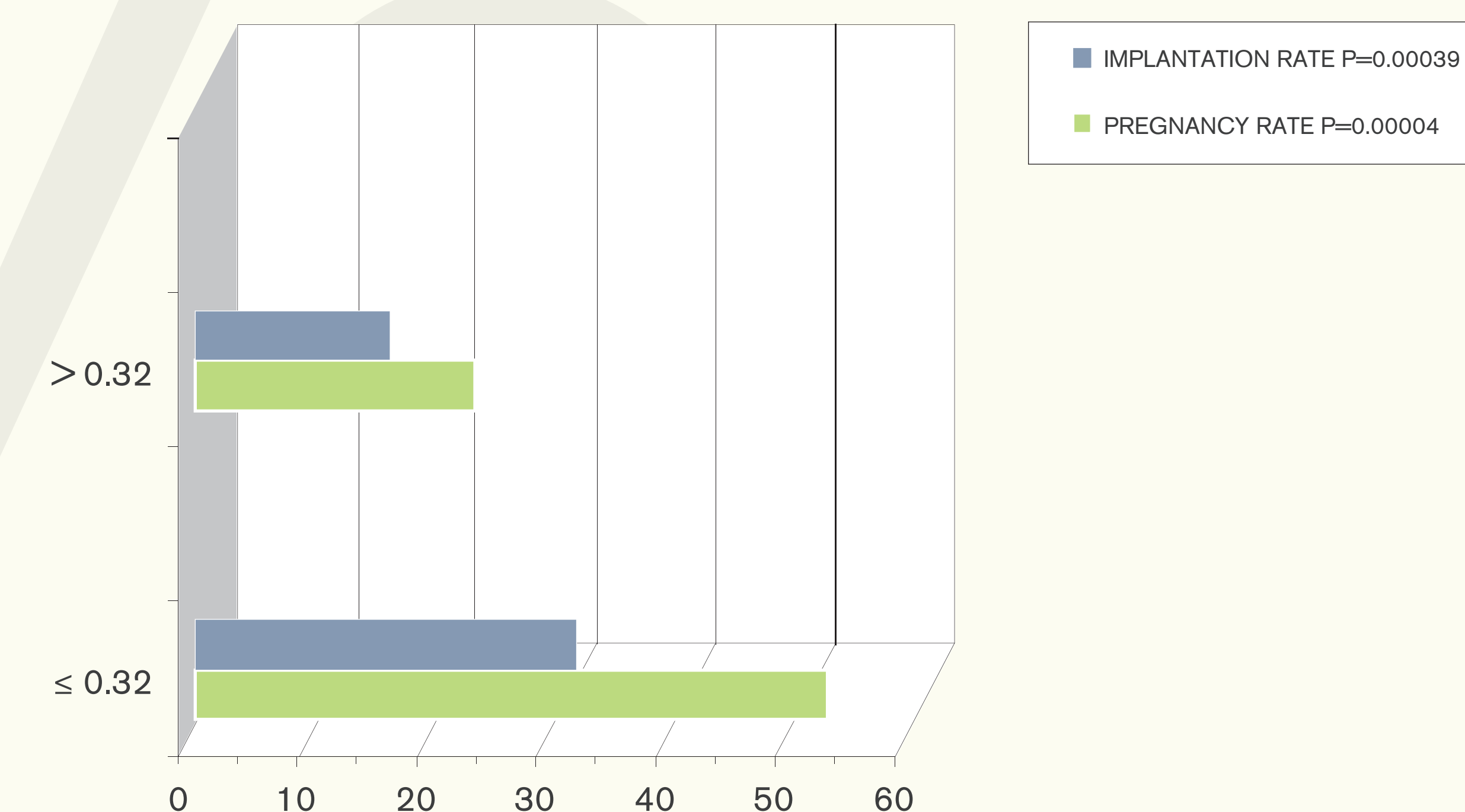
## Type of protocol



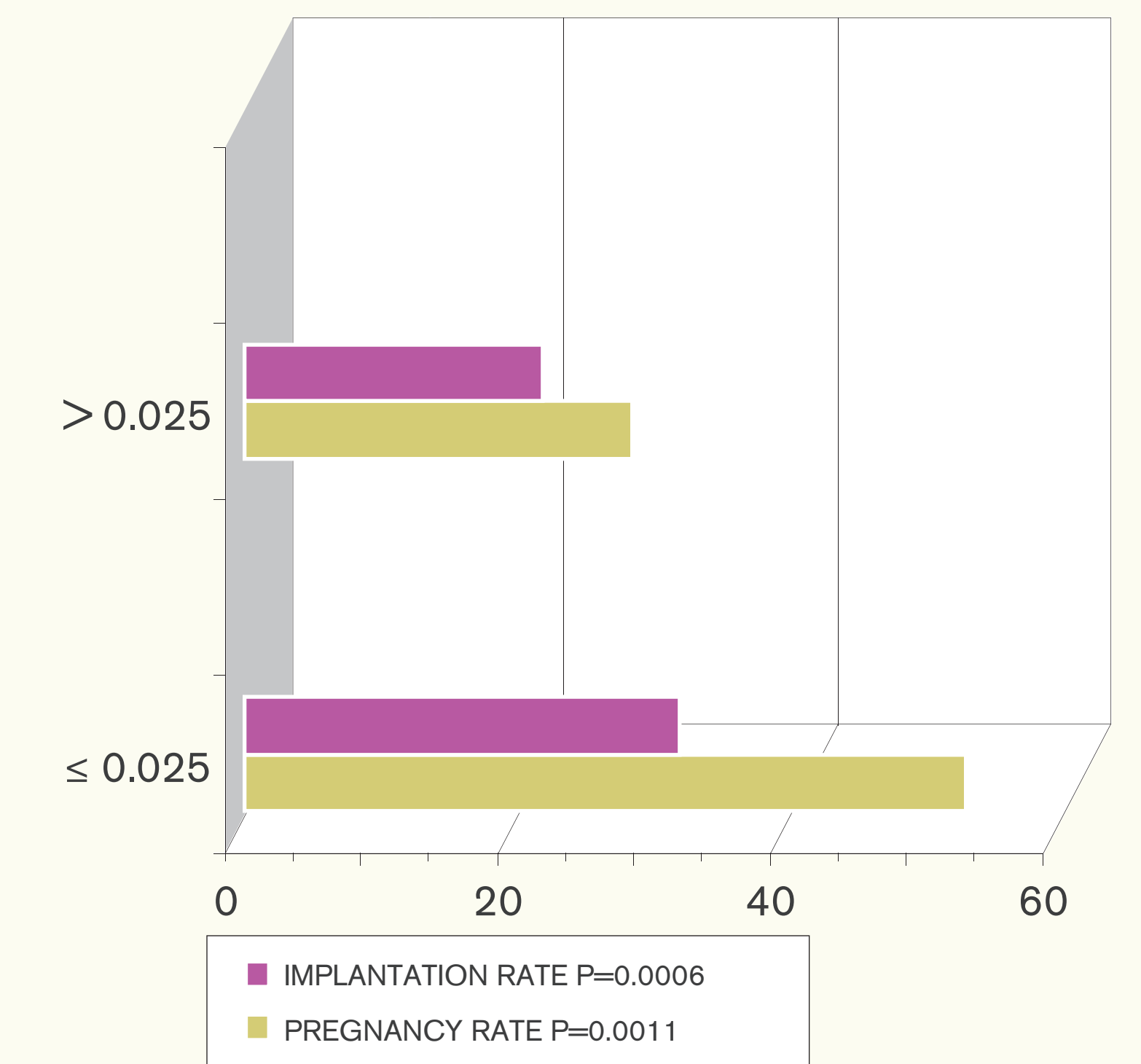
## Results by Pg value and Pg/E2 ratio



## Results - Pg/MIl oocyte ratio



## Results -Pg/E2 ratio per MII oocyte



## Conclusion

- In this study, absolute Pg value was not a good predictor of pregnancy - Pg > 0.9ng/mL had higher pregnancy rates.
- Defining arbitrary Pg/E2 ratio of 1 also was not predictive of outcome.
- However, Pg/E2 ratio per MII and Pg per MII were predictive of pregnancy with statistically significant results.
- Advantage of these ratios is that they are applicable in all types of cycles including poor or high responders.
- Study is ongoing to increase the sample size and add significance.
- In future, these calculations could assist in decision whether to perform embryo transfer in current cycle or to freeze embryos and replace them in a cycle where the endometrium would be more receptive, thereby increasing the success rate.

## References

Ziegler D, Brioschi PA, Fanchin R, Bulletti C. Confronting the hidden face of progesterone during follicular phase. J Ass Reprod Gen 2003;20:29-32.

Younis JS, Moshe M, Radin O, Moshe BA. Increased progesterone/estradiol ratio in the late follicular phase could be related to low ovarian reserve in in vitro fertilization-embryo transfer cycles with a long agonist-releasing hormone agonist. Fertil Steril 2001;76:294-299.

Ou YC, Lan KC, Chang SY, Kung FT, Huang FJ. Increased progesterone/estradiol ratio on the day of hCG administration. Taiwan J Obstet Gynecol 2008;47:168-174.

Lee FK, Lai TH, Lin TK, Horng SG, Chen SC. Relationship of progesterone/estradiol ratio on day of hCG administration and pregnancy outcomes in high responders undergoing in vitro fertilization. Fertil Steril 2009;92:1284-1289.

