**Hormonal profile** of the same oocyte donors stimulated with either GnRH antagonist or agonist compared with natural cycles

Núñez, R. Ortega, L. García, A. Guijarro, A. Cortés, S. Caballero, P. Clinica Tambre. Madrid

### Objectives
The aim of the present study was to characterize hormonal profile during the early and the mid-secretory phase of unsupplemented in vitro fertilization cycles (IVF) in the same egg donors, stimulated in association with rFSH and either GnRH antagonist or GnRH agonist, compared with natural cycles.

A prospective clinical study was conducted at Clinica Tambre, including 15 oocyte donors who underwent each one: a COS with rFSH and GnRH antagonist, a COS with rFSH and GnRH agonist and a natural cycle from July 2011 to December 2012.

### Introduction
Due to inherent differences between GnRH antagonists and agonists, their effect on ovarian steroidal production during the luteal phase of IVF cycles may differ. However, despite the wide introduction of GnRH antagonists and GnRH agonists for controlled ovarian stimulation (COS), studies analyzing the luteal phase of unsupplemented GnRH antagonist or agonists cycles are lacking, because of the difficulty of conducting such a trial.

### Material and methods
A prospective clinical study was conducted at Clinica Tambre, including 15 oocyte donors who underwent each one: a COS with rFSH and GnRH antagonist, a COS with rFSH and GnRH agonist and a natural cycle during the period of July 2011 to December 2012.

For the same oocyte donor (n = 15), blood samples were collected during the early (day LH +2) and mid-luteal phase (day LH + 7) of a natural cycle and, subsequently, on HCG +2 and HCG +7 of a stimulated cycle with GnRH antagonist treatment and finally, a GnRH agonist treatment. Estradiol, LH, FSH, Progesterone, Prolactin and Testosterone were evaluated for all the three cycles. Patients received no kind of luteal phase supplementation in any of the study groups.

Analysis of variance (ANOVA) with repeated measures was used to compare the hormonal parameters during the luteal phase. Only donors that had complete data in each of the measurement days during the luteal phase were included in the analysis.

### Results
During the early luteal phase (D+2), serum oestradiol levels were significantly lower in natural cycle (178,08±40,15 ng/l) (p<0,001) compared with the agonist cycle (1574,14±658,7 ng/l) and antagonist cycle (870,45±352,8 ng/l). At this time point, the serum concentrations of FSH and LH were significantly higher in the natural cycles compared with stimulated cycles (p<0,001). Progesterone concentration were significantly lower in natural cycle (3,41 ± 3,71 nmol/l) compared with agonist (52,65±9,8 nmol/l) and antagonist (34,54±26,1 nmol/l) cycles. (p<0,001).

Estradiol levels remained significantly higher in the agonist cycle compared with antagonist and natural cycles on mid luteal phase. (p<0,01). During the mid-luteal phase, FSH and LH levels decreased comparably in all three cycles.

### Conclusions
The comparisons of hormonal profile from the same donor between natural and stimulated cycles revealed that luteal LH serum concentrations are lower, whereas values of oestrogen and progesterone were higher in unsupplemented IVF cycles stimulated with GnRH antagonist either GnRH agonist in comparison with natural cycles.

This is the first study analyzing by paired samples the hormonal profiles from the same woman during the pre-receptive to the receptive transition both in a natural and in a subsequent stimulated cycle which seems an essential condition to minimize the impact of inter-patient variability.

Studies on the luteal phase are mandatory as it is during that period of time that embryonic implantation takes place and low pregnancy rates have been associated with an abnormal luteal phase profile.


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![Graphs showing hormonal profiles](image_url)