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Early Progesterone Rise in the Follicular Phase: Predictor of Anovulation?

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PURPOSE & OBJECTIVES

- To investigate the role of progesterone levels during the follicular phase.
- While estradiol and luteinizing hormone levels are commonly used to monitor the follicular phase, progesterone levels are not typically considered until after ovulation in the luteal phase[1,2].
- However, previous studies have noted a rise in progesterone prior to ovulation. We further explored this phenomenon using an at-home quantitative platform to analyze progesterone patterns during the follicular phase.

MATERIAL & METHODS

- 4,209 menstrual cycles from a cohort of 1,617 women were studied.
- Study participants all used Oova, a home-based hormone testing platform, which pairs urine-based lateral flow quantitative and multiplexed immunoassay technology with AI-enabled image processing via a smartphone camera to provide quantitative urinary measurements of luteinizing hormone (LH) and progesterone.
- The Oova App also collects self-reported demographic and clinical information.
- Hormone data was used to classify cycles as ovulatory or anovulatory.
- A cycle was considered ovulatory if an LH peak over 35 mIU/L was detected, and a progesterone rise of at least 6.5 ng/mL post-LH peak.

Early progesterone rise in the follicular phase may help predict anovulatory cycles.

At-home hormone monitoring through urine allows for more comprehensive, continuous progesterone tracking in the follicular and luteal phases for individuals trying to conceive.

RESULTS

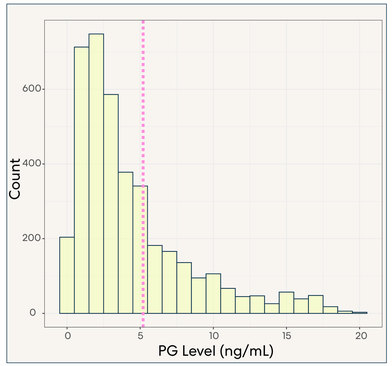

Figure 1: Variability in Maximum Progesterone Levels Across the Follicular Phase
The histogram showcases the number of cycles where distinct maximum progesterone levels were observed during the follicular phase.

The pink dashed line represents the mean maximum progesterone value derived from comprehensive cycle monitoring within the study.

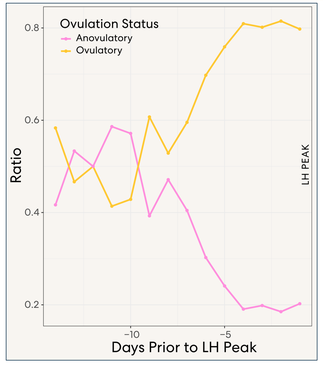

Figure 2: Timing of Progesterone Surges During the Follicular Phase Relative to LH Peak in Cycles
The calculated ratio for each cycle day captures the presence of progesterone rises and their proximity to the LH peak.

The data unequivocally emphasizes that ovulatory cycles saw an elevated progesterone surge closer to the LH peak, while anovulatory cycles exhibited an earlier follicular phase progesterone rise, distinctly separated from the detected LH peak.

RESULTS

- The average progesterone peak during the follicular phase was 5.227 ng/mL and remained elevated for an average of 3.278 days.
- The average progesterone peak did not differ significantly between ovulatory and anovulatory cycles.
- However, the timing of the progesterone rise showed promise as a potential indicator of whether a cycle would be ovulatory or anovulatory.
- Anovulatory cycles had an earlier progesterone rise in the follicular phase, leading to a longer gap between the progesterone rise and LH peak (mean of 6.05 ± 1.16 days). In contrast, ovulatory cycles had a mean progesterone 3.37 ± 0.08 days prior to LH peak.
- This timing difference was statistically significant ($p < 0.05$), suggesting that the timing of progesterone during the follicular phase could serve as a predictive marker for ovulatory cycles.

CONCLUSIONS

- Our data highlight the benefit of monitoring progesterone levels earlier in the cycle in patients trying to conceive.
- By understanding the progesterone dynamics during the follicular phase, an accurate prediction can be made on whether a cycle should be expected to be ovulatory or anovulatory.
- While excessive blood tests may not be preferred, home monitoring through urinary testing is a user-friendly tool to monitor cycles.

REFERENCES

[1] De Geyter C., et al. Prog. serum levels during the follicular phase of the menstrual cycle originate from the crosstalk between the ovaries and the adrenal cortex, Human Repro, Vol 17-4, Apr 2002.

[2] Batista M, et al. Evidence for a critical role of prog. in the regulation of the midcycle gonadotropin surge and ovulation. J Clin Endocrinol Metab. 1992 Mar.

CONTACT INFORMATION

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