# Characterization and Outcomes of Luteal Phase Supportive Treatments in Infertile Women

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## Introduction

Luteal phase deficiency (LPD), a potential contributor to infertility, is characterized by a shortened luteal phase and low serum progesterone levels.

The International Natural Procreative Technology Evaluation and Surveillan ce of Treatment for Subfertility (iNEST) cohort used Natural Procreative Technology (NPT) and Creighton Model FertilityCare system (CrMS) to track menstrual cycle characteristics and correct underlying conditions through medical interventions. Preliminary findings showed 77% of women had LPD.

## Objective

This study aims to characterize and evaluate menstrual cycle length, luteal phase length, luteal spotting, and conception rates per cycle with or without luteal phase supportive treatments **human chronic gonadotropin** (hCG) and **progesterone.**

We also aim to report frequency of luteal phase supportive treatments in women treating infertility.

## Methods

**Study Design**: Secondary inquiry and data entry of iNEST deidentified CrMS charts from the study period January 2006 to December 2016.

**Inclusion**: Women ≥ 18 years old, desiring live birth, enrolled in the iNEST study.

**Exclusion**: Incomplete or missing cycle parameter chart data.

**Statistical Analysis:** Descriptive statistics for patient demographics and medication frequency. Generalized linear mixed model for assessment of menstrual cycle characteristics.

## Results

**Table 1.** Characteristics of 255 study participants (iNEST 2006 – 2016).

| Variable | Female n (%) |
|---|---|
| **Age (years)** | |
| <25 | 5 (2) |
| 25 - 29 | 57 (22.4) |
| 30 - 34 | 85 (33.3) |
| 35 - 39 | 72 (28.2) |
| 40 - 44 | 31 (12.1) |
| ≥ 45 | 5 (2) |
| **Race/ Ethnicity** | |
| White/ Non-Hispanic | 182 (71.3) |
| Asian/ Non-Hispanic | 14 (5.5) |
| Any Race/ Hispanic | 12 (4.7) |
| Other | 4 (1.6) |
| Missing | 43 (16.9) |
| **Pregnancy History** | |
| Previous pregnancy | 103 (40.4) |
| No previous pregnancy | 138 (54.1) |
| Missing | 14 (5.5) |
| **Previous Live birth** | |
| Live birth | 43 (16.9) |
| No live birth | 76 (29.8) |
| Missing | 136(53.3) |

**Table 2**. Medication use from 2563 cycles of 255 females (iNEST 2006 – 2016).

| Medication | Cycle Level n (%) |
|---|---|
| Progesterone | 359 (14.01) |
| Luteal hCG | 107 (4.17) |
| Progesterone + hCG | 34 (1.33) |

**Table 3**. Unadjusted risk ratio of spotting during the luteal phase by medication (iNEST 2006 – 2016).

| Variable | Risk Ratio (95% CI) | P Value |
|---|---|---|
| Progesterone | 1.29 (0.93 to 1.78) | 0.1304 |
| Luteal hCG | 1.12 (0.65 to 1.92) | 0.6909 |
| Without medication | 1.00 (Reference) | - |

**Table 4**. Unadjusted probability of conception by medication (iNEST 2006 – 2016).

| Variable | Probability Ratio (95% CI) | P value |
|---|---|---|
| Progesterone | 1.00 (0.99 to 1.01) | 0.4809 |
| Luteal hCG | 1.00 (0.97 to 1.02) | 0.7157 |
| Without medication | 1.00 (Reference) | - |

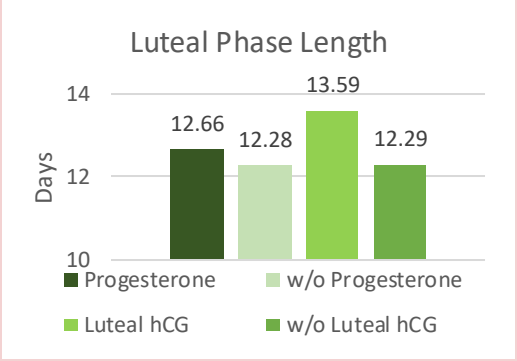


**Figure 1.** Average luteal phase length (days) comparison by treatment from 2563 cycles (iNEST 2006 – 2016).

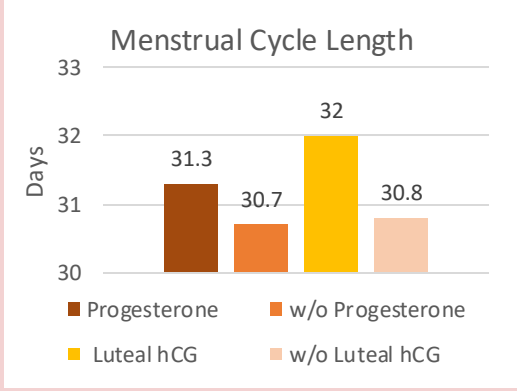


**Figure 2.** Average menstrual cycle length comparison by treatment from 2563 cycles (iNEST 2006 - 2016).

## Discussion & Conclusion

The findings in this study help to further clarify existing data on LPD and luteal supportive medications.

Menstrual cycle and luteal phase length were slightly longer with supportive medications; however, hCG produced the only statistically significant lengthened luteal phase.

Spotting during the luteal phase was increased with hCG and progesterone respectively, though they were not statistically significant.

Conception rates showed no difference with or without progesterone or hCG but failed to show statistical significance.

Limitations:

- Population generalizability
- Patient reported data
- Non-reported medication dosing leading to imprecision estimates

Future studies: Larger cohort focused on luteal phase supportive medication optimization with standardized dosing regimens and real-world generalizability.

Data continues to be analyzed from the iNEST cohort.

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