

Abstract Details

Session title: Session 44: What are the optimal regimes for frozen embryo transfer?

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Abstract title:

Comparison of day-5 serum progesterone levels using different routes of administration for artificial endometrial preparation: Inpatient variation.

Biography

Gynaecologist

Dr. Cerrillo is a full-time Gynaecologist at IVI Madrid specialist in Reproductive Medicine. She completed her Medical degree in Surgery and Medicine at the University of Miguel Hernandez de Elche (Alicante) in 2001, she made the MIR (Speciality of Obstetrics and Gynaecology in General Hospital of Albacete between 2002-2006) and obtained his doctorate degree "cum laude" in 2010 in the Pediatrics, Obstetrics and Gynaecology Department of the University of Rey Juan Carlos I. She did a Master in Reproductive Medicine in 2011 of URJC.

M. Cerrillo Martínez¹, G. Nardini¹, M. Cruz², M. Mayoral¹, M. Toribio³, E. Labarta⁴, J.A. García Velasco⁵.

¹IVI Madrid, Reproductive Medicine, Madrid, Spain.

²IVI Madrid, embryology, Madrid, Spain.

³IVI Madrid, Nurse department, Madrid, Spain.

⁴IVI Valencia, Reproductive Medicine, Madrid, Spain.

⁵IVI Madrid- URJC, Reproductive Medicine, Madrid, Spain.

Study question:

Is there any variability on the day-5 serum progesterone levels during artificial endometrial preparation using different routes of administration for Luteal phase (LP)?

Summary answer:

Day-5 serum progesterone levels seem to be maintained above 9.2 ng/mL irrespective of the route of administration.

What is known already:

Progesterone for artificial endometrial preparation can be administered orally, vaginally, subcutaneously or intramuscularly. Although the use of different P4 preparations differ among countries and physicians, vaginal route seems to be the most preferred one, but new options for luteal support are available nowadays. Previous studies suggest that a minimum threshold of day-5 serum progesterone levels needs to be reached during hormonal replacement therapy in order to improve ongoing pregnancy rates. However, there is controversy on the efficacy of distinct types of progesterone preparations and routes of administration. More studies are needed to fully understand the physiology of progesterone in ART

Study design, size, duration:

Prospective cross-over pilot study performed between January and June 2019 in IVI-RMA Global clinic, Madrid, Spain. We aimed to evaluate if there is significant inpatient variation on the day-5 serum progesterone levels with the use of different routes of administration during hormonal replacement therapy. IRB approval 1809-MAD-063-MC

Participants/materials, setting, methods:

Three different protocols were administered to 5 participants underwent 3 consecutive cycles of HRT. LP support consisted on 1^o) vaginal progesterone 400 mg/12 hours ; 2^o) subcutaneous progesterone 25 mg/12 hours ; and 3^o) intramuscular progesterone 50 mg / 24 h . After estrogen priming for 10 days, P4

was given for 5 days, with daily serum P were performed. Linear regression model accounted for progesterone levels (response variable) and route of administration (explanatory variable).

Main results and the role of chance:

The mean day-5 serum progesterone levels depending on the route of administration were as follows a) 14.6 ± 5.5 ng/mL; b) 47.9 ± 22.3 ng/mL; and c) 60.3 ± 65.5 ng/mL. The linear regression model showed that changing vaginal progesterone to either subcutaneous or intramuscular route had a statistically significant effect on serum progesterone levels, with an average increase of 25 ng/mL (5.4 - 45.1 ng/mL; $p=0.01$) using the subcutaneous route and 32 ng/mL (13 - 52.7 ng/mL; $p=0.001$) with the intramuscular route. The mixed effects model proved that the subcutaneous preparation maintained the mean progesterone level at 29.5 ng/mL (SE: 7.6, fixed effect), while the intramuscular preparation showed a mean value of 18.1 ng/mL (SE: 9.75, fixed effect). Age and body mass index did not produce a significant effect on the results of the mixed model analysis. Despite the route of administration, all progesterone preparations achieved a mean day-5 serum level above the threshold of 9.2 ng/mL, which is considered the optimal cutoff according to a previous prospective cohort. Of note, one patient did not reach the recommended day-5 concentration with vaginal progesterone.

Limitations, reasons for caution:

This is a cross-over pilot study with preliminary data and few patients. Further studies are needed to better understand circulating progesterone levels during hormonal replacement therapy and its impact on reproductive outcomes. Nevertheless, considering the scarcity of data, our results provide important insights and draw attention to inpatient variability.

Wider implications of the findings:

Apparently, the three types of progesterone preparations lead to sufficient circulating hormone levels in the day of the embryo transfer. However, in the era of personalized reproductive medicine, endometrial preparation and luteal phase support deserve further investigation and patient-specific behaviors must be taken into account.

Keywords:

progesterone

DAY 5

VAGINALPROGESTERONE

INTRAMUSCULAR PROGESTERONE

SUBCUTANEOUS PROGESTERONE