Title: THE IMPACT OF TRILAMINAR ENDOMETRIAL LINING THICKNESS ON PREGNANCY OUTCOMES IN MODIFIED NATURAL EUPLOID FET, A SINGLE INSTITUTION STUDY OF 3980 CYCLES

Authors: Monica Pasternak, MD, MBA; Mark Sikder; Nam Tran, MD, PHD. Spring Fertility, San Francisco, CA

Background: Obstetrical outcomes have significantly improved with technology enabling single euploid embryo transfer (SET). National ongoing pregnancy rates after euploid SET generally range from 50-65%. As we continue our mission as a field to improve FET outcomes, we must look for measurable parameters to assess the predicted success of euploid SET. Although uterine factor is considered a rare cause of subfertility, and uterine anatomy is routinely analyzed prior to transfer by imaging modalities, there is utility in identifying other uterine gradations to try to both optimize outcomes, and predict success of transfer on an individual basis.

Objective: This study seeks to evaluate euploid SET outcomes based upon uterine lining thickness. Patients with trilaminar uterine linings were stratified by age and separated by lining measurements (in mm) <6, 6-6.9, 7-7.9, 8-8.9, 9-10.9, 11-12.9, and >13. Our primary outcome was clinical pregnancy, and secondary outcomes included pregnancy loss, biochemical pregnancy, and live birth rate.

Materials and Methods: This is a single institution retrospective study assessing all euploid FET between January 2017 and August 2023. 3,980 FET cycles were included. Trilaminar ndometrial lining thickness at its last measurement in a transfer cycle was separated into the following categories (in mm) <6, 6-6.9, 7-7.9, 8-8.9, 9-10.9, 11-12.9, and >13. Other controlled variables included BMI, age at transfer (<30, 31-34, 35-37, 38-40, 41-42, >42yo), and AMH of patient. Only modified natural transfer cycles were included in this study. 70-80% of euploid FET at our center follow a modified natural protocol. Programmed FET cycles were not included as at our center they generally are the treatment choice of poorer prognosis patients, those falling outside the parameters of our study, or gestational carriers (who are known to have a generally slightly improved prognosis per FET). We also eliminated patients with known uterine factors such as leiomyomata, or history of uterine synechiae. Patients with an outcome of ectopic pregnancy were not included in this study. All euploid embryos were day 5 or 6 at time of blastulation, and graded as AA, AB, or BA only.

Result(s): Between 6 to 13mm endometrial lining thickness (EML), there was no statistically significant difference in clinical pregnancy rates, with all subgroups ranging between 65-79%. The success in patients with a lining <6mm was lower (62%) and this was clinically significant. There was no statistical significance in outcome between age group at time of FET. There was no clinically significant difference in biochemical pregnancy or miscarriage across all EML categories, with rate ranging from 1-4.8% in the former, and 2-4.6% in the latter. An improvement in live birth rate achieved statistical significance in patients with a lining between 6-12.9mm, compared with those <6mm and >12.9mm.

Conclusion(s): In patients undergoing modified natural FET of a euploid embryo, obstetrical outcomes including clinical pregnancy, biochemical pregnancy, miscarriage, and live birth rates are similar for patients across all age demographics with trilaminar uterine linings between 6-12.9mm. Further investigation is needed to delineate the negative impact on live birth rates specifically in linings >13mm.

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