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CAN THE ENDOMETRIUM BE TOO THICK? AN ANALYSIS OF SINGLE EUPLOID EMBRYO TRANSFER (SEET) CYCLE PREGNANCY OUTCOMES

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OBJECTIVE:

Estrogen is used to prepare the endometrium prior to a frozen embryo transfer. An endometrial thickness (EMT) ≥ 7 mm on the day of embryo transfer (ET) is associated with increased likelihood of pregnancy. However, few studies have investigated whether there is an upper limit of endometrial thickness at ET that affects implantation potential.¹ The objective of this study is to determine whether there is a correlation between increasing EMT and ART cycle outcomes in SEET cycles.

MATERIALS AND METHODS:

The study included patients who underwent an autologous or donor egg SEET cycle from September 2016 to March 2021 with an EMT ≥ 7 mm on cycle day 10-15 after preparation with oral Estradiol. Demographic and cycle characteristics including oocyte age, BMI, AMH, peak E2, P4 prior to ET, day of embryo biopsy, embryo quality and days of estrogen treatment were collected. Primary outcome was ongoing clinical pregnancy rate (OPR). Secondary outcomes included implantation rate (IR), biochemical pregnancy rate, and early pregnancy loss rate. Data was analyzed using student's t-test, chi-square, and Spearman's correlation. General estimating equations (GEE) model with exchangeable working correlation structure was used to account for multiple cycles from the same patients.

RESULTS:

A total of 4,911 SEET cycles were identified and included in the study. Included patients had a mean oocyte age of 35.63, BMI of 24.2, and an average of 18.2 days of oral estradiol prior to ET. Implantation, biochemical pregnancy, early pregnancy loss, and ongoing clinical pregnancy rates were calculated for each mm of endometrial thickness starting at 7mm. Increasing EMT was correlated with IR ($r = 0.50$, $p = <0.0001$) and OPR ($r = 0.84$, $p = <0.0001$). The highest IR was observed for women with an EMT of 14mm (79%), above which the IR decreased to 71% at 15mm, and 60% at ≥ 16 mm. The highest OPR occurred at an EMT of 15mm (67%), above which it decreased to 47%. However this decrease was not statistically significant after adjusting for oocyte age, BMI, peak E2, P4 prior to transfer, endometrial type, AMH, uterine factor, embryo quality, prior transfer outcomes and embryo biopsy day for both IR ($\beta = 0.27$, $p = 0.61$), and OPR ($\beta = 0.26$, $p = 0.64$).

CONCLUSIONS:

Our study demonstrates a positive correlation between increasing EMT ≥ 7 mm and OPR in SEET cycles up to 15mm. Future studies evaluating endometrial vascularity and endometrial metabolic profiles and their association with endometrial thickness may further expand our understanding of endometrial physiology and its impact on clinical outcomes.



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IMPACT STATEMENT:

An EMT between 7-15mm is correlated with sustained implantation and ongoing clinical pregnancy rates; providers can be reassured that increasing endometrial thickness up to 15mm is not associated with adverse pregnancy outcomes.

References:

Zhang Q, Li Z, Wang Y, Lu H, Yu Y. The relationship and optimal threshold of endometrial thickness with early clinical pregnancy in frozen embryo transfer cycles. *Int J Gynaecol Obstet*. 2021 Jan 18. doi: 10.1002/ijgo.13606. Epub ahead of print. PMID: 33459362.