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# THE ASSOCIATION OF ENDOMETRIAL THICKNESS AND ENDOMETRIAL TYPE WITH IVF OUTCOMES IN A SHARED OOCYTE DONOR-RECIPIENT MODEL

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## OBJECTIVE:

The effect of endometrial thickness and type on pregnancy outcomes of ART cycles is controversial.[1-2] A challenge in evaluating the role of the endometrial characteristics is the inability to completely control for the impact of egg quality in patients who have difficulty achieving an “adequate lining."[2] Assessing transfer outcomes among shared recipients of the same oocyte donor allows for a more precise assessment of the role of endometrial characteristics in embryo transfer outcomes. The objective of this study is to evaluate the impact of endometrial thickness and type on ART cycle outcomes among shared oocyte donor recipients.

## DESIGN:

Retrospective cohort study

## MATERIALS AND METHODS:

Shared recipients of the same oocyte donor cycle from July 2002 through May 2019 were included in the study. Endometrial thickness and type at progesterone start were analyzed. Demographic and cycle characteristics and outcomes were compared among recipients with an endometrial thickness of < 7 vs. ≥7mm, and among recipients with an endometrial type of 1 compared to types 2 and 3. Comparative statistics were used to compare the groups. Mixed effects logistic regression was used to analyze the impact of endometrial thickness and endometrial type on clinical pregnancy (CP) and live birth (LB) rate among shared recipients of the same donor cycle, accounting for repeated recipients and donors. Potential confounders

considered were recipient age, donor age, days of estradiol administration, embryo quality, frozen embryo, euploid embryo, number of embryos transferred, and embryo age. A threshold value for endometrial thickness associated with improved odds of LB was calculated using an area under the curve model.

**RESULTS:**

A total of 2075 oocyte recipient transfer cycles from shared donors were identified and included in the study. 468 donors and 1364 recipients were included in the analysis. Recipients with endometrium <7mm (N=73) had a significantly lower LB rate compared to recipients with lining ≥7mm (N=2000) (31.5% vs. 48.7%, p=0.0039). There were no significant differences in CP and LB rates among type 1 (N=947) compared to type 2/3 (N=1055) endometrial lining. Increased endometrial thickness was significantly associated with CP (OR 1.08, 95% CI 1.02-1.14, p=0.004) and LB rates (OR 1.07, 95% CI 1.02-1.13, p=0.008) after controlling for confounders. The thickness threshold that simultaneously maximized sensitivity and specificity for LB was 10 mm, with an average probability of LB of 0.48 and sensitivity and specificity of 0.59 and 0.62, respectively. The model AUC was 0.65.

**CONCLUSIONS:**

When controlling for the oocyte factor using a shared donor model, patients with endometrial thickness of ≥7mm had increased LB rate, however a thicker lining was associated with better outcomes, with LB rate optimized at a threshold of 10 mm. This data will be used to generate a multi-dimensional model to optimize synchronization and endometrial preparation to maximize the likelihood of implantation and positive reproductive outcome.

**REFERENCES:**


1. K E Liu, M Hartman, A Hartman, Z -C Luo, N Mahutte, The impact of a thin endometrial lining on fresh and frozen–thaw IVF outcomes: an analysis of over 40 000 embryo transfers, *Human Reproduction*, Volume 33, Issue 10, October 2018, Pages 1883–1888, https://doi-org.eresources.mssm.edu/10.1093/humrep/dey281
2. Gingold JA, Lee JA, Rodriguez-Purata J, et al. Endometrial pattern, but not endometrial thickness, affects implantation rates in euploid embryo transfers. *Fertility and Sterility*. 2015;104(3). doi:10.1016/j.fertnstert.2015.05.036.