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**THE ASSOCIATION BETWEEN PRIOR CESAREAN SECTION AND ASSISTED REPRODUCTIVE TECHNOLOGY (ART) OUTCOMES IN WOMEN UNDERGOING AUTOLOGOUS SINGLE THAWED EUPLOID EMBRYO TRANSFER**

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**OBJECTIVE:**

Rates of cesarean section (CS) continue to increase worldwide [1]. Although a CS is often a necessary intervention, it presents increased risk for short and long-term sequelae in mother and infant [2]. Previous work suggests an association between prior CS and reduced fertility in both natural and ART cycles [3-5]. To our knowledge, there is no published research exploring the relationship between a prior CS and subsequent single thawed euploid embryo transfer (euploid SET). The objective of this study was to determine whether prior mode of delivery correlates with subsequent ART outcomes in patients undergoing euploid SET.

**DESIGN:**

Retrospective cohort study

**MATERIALS AND METHODS:**

All patients undergoing autologous euploid SETs at an academic center with a prior vaginal delivery (VD) or CS from 2012 to 2020 were identified. Cases included patients with 1 prior CS; controls included patients with 1 prior VD. Exclusion criteria included patients with >1 previous live birth and donor/recipient cycles. Our primary outcome was implantation rate (IR); secondary outcomes were ongoing pregnancy/live birth rate (OP/LBR), biochemical pregnancy rate (BPR), and clinical loss rate (CLR). Baseline demographics were obtained: age (at time of



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retrieval and transfer), body mass index (BMI), obstetric history, endometrial thickness at time of transfer (ETATT), presence of blood in catheter and catheter type as markers of transfer difficulty, embryo grade (Modified Gardner), and day of embryo biopsy for genetic testing. Statistical analysis was performed using Student's t-test, Mann-Whitney U test, and chi-square. Logistic multivariable regression models were used to calculate odds ratios and to adjust for confounders, with  $P < 0.05$  considered significant.

## RESULTS:

551 euploid SETs met inclusion criteria and were included in analysis (VD:  $n=347$ ; CD:  $n=204$ ). Patients with a prior CS had a higher BMI (24.50 vs 23.47,  $p=0.009$ ) than those in the VD cohort; demographic data were otherwise similar. In univariate analysis, IR and OP/LBR were significantly lower in patients with a prior CS compared with VD (58.33% vs 68.01%,  $P=0.02$  and 50.00% vs 59.65%,  $P=0.03$ , respectively). After adjusting for age at time of retrieval and transfer, BMI, ETATT, difficulty of transfer, day of biopsy, and embryo grade, prior CS was associated with 41% lower odds of implantation (OR 0.59, CI 0.40-0.88). After adjusting for the same confounders, prior CS was also associated with 38% lower odds of ongoing pregnancy/live birth (OR 0.62, 0.42-0.92). We saw no differences in BPR or CLR.

## CONCLUSIONS:

This is the first study to demonstrate a significant reduction in IR and OP/LBR associated with a prior CS in patients undergoing euploid SET. Patients who deliver via CS may experience post-CS scarring and subsequent isthmocele formation which may alter the uterine milieu and lead to suboptimal implantation. Patients looking to build families with multiple offspring should be counseled that prior CS appears to be associated with significantly lower success following euploid SET. Our work further stresses the importance on a national level of reducing primary CS rates.

## REFERENCES:

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