

Title: PERINATAL OUTCOMES IN PREGNANCIES ACHIEVED THROUGH GESTATIONAL SURROGACY: INVESTIGATING THE INFLUENCE OF TREATMENT VERSUS HOST EFFECTS ON ART OUTCOMES

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Background: Existing evidence demonstrates a consistent association between the use of assisted reproductive technologies (ART) and adverse perinatal outcomes such as low birthweight (LBW) and preterm delivery. It remains unclear whether these poor outcomes may be attributed to a “treatment effect” or to the underlying infertility, a “host effect”. Gestational surrogacy (GS) represents an optimal model to evaluate the magnitude of each of these effects by allowing a comparison between GS births and those conceived spontaneously and carried by the same host, thus holding maternal factors constant and isolating the effect of ART treatment.

Objective: To determine whether pregnancies achieved through GS are associated with increased risk for adverse perinatal outcomes when compared to spontaneous pregnancies carried by the same host.

Materials and Methods: We conducted a retrospective cohort analysis of gestational surrogates delivering live births between January 1995 and December 2005 from a single surrogacy agency. Comparison of outcomes between spontaneous and GS pregnancies was performed using random effects multivariable logistic regression to adjust for multiple covariates, and to account for correlation between birth outcomes to the same woman.

Results: Data were obtained for 128 births, of which 75 were singletons conceived spontaneously. There were 53 births from GS, of which 29 (55%) were singletons. Among singletons, the number of preterm births (<37 weeks gestation) was not significantly different between spontaneous (5%) and surrogate gestations (14%) (p=0.17). However, after adjusting for gestational age, parity, and fetal gender, offspring of surrogate births were, on average, 484 grams lighter (p<0.01) and were at significantly greater risk for LBW (<2500 g) (p<0.01). With respect to obstetrical and neonatal complications, there were no significant differences between the two groups but there was a trend toward increased rates of preterm labor and preterm premature rupture of membranes among surrogate births (see table 1).

Table 1. Adverse obstetrical and neonatal outcomes among spontaneous and surrogate singleton gestations

	Spontaneous	Surrogate	p-value
Low birth weight	0 (0%)	4 (15%)	0.01
Pregnancy induced hypertension	2 (3%)	2 (7%)	0.31
Pre-eclampsia	1 (1%)	0 (0%)	>0.99
Pre-term Bleeding	5 (7%)	3 (10%)	0.68
Gestational Diabetes	0 (0%)	2 (7%)	>0.99
Placenta Previa	1 (1%)	2 (7%)	0.19
Preterm Labor	2 (3%)	4 (14%)	0.05
NRFHT¹	4 (5%)	0 (0%)	0.57
Oligohydramnios	1 (1%)	1 (3%)	0.48
PPROM²	1 (1%)	3 (10%)	0.06
Meconium	3 (4%)	0 (0%)	0.56
Placental Abruption	1 (1%)	0 (0%)	>0.99
NICU Admission	5 (7%)	0 (0%)	0.32

¹NRFHT = Non-reassuring fetal heart tracing

²PPROM = Preterm premature rupture of membranes

Conclusions: While controlling for maternal factors and other potential confounders, we determined that singleton births resulting from GS are at significantly increased risk for LBW than those conceived spontaneously. These data suggest that previously reported adverse perinatal outcomes associated with ART are attributable to a treatment effect rather than the underlying infertility.