A Retrospective Cohort Analysis of Cerclage in Triplet Pregnancies: Perinatal Outcomes & Gestational Age at Delivery

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BACKGROUND

The risk of preterm birth in triplet pregnancies is significant. Cervical cerclage has not demonstrated efficacy in this population. However, only a few small studies that address this subject have been published. We analyzed a national database to delineate the risk of preterm birth & perinatal complications after cerclage placement in triplet pregnancies.

METHODS

All U.S. triplet births (2006-2013) with prior preterm birth or abortions (indicators of cervical insufficiency) were selected. Congenital anomalies, diabetes/hypertension disorders (common indications of delivery) & induction of labor cases were excluded. Variables analyzed included: demographics, obstetric interventions, gestational age at delivery, perinatal complications, neonatal outcomes (low Apgar, assisted ventilation, NICU admission, surfact/antibiotic use, seizures). Cases that underwent cerclage placement were selected, with non-cerclage triplets as controls, matched by demographic & preceding obstetric data (planned ratio 1:1). Binary comparisons included MWU & $\chi 2$ test. Logistic and Cox regression were used to calculate adjusted odds and hazard ratios of preterm birth & complications (outcome) according to cerclage placement (predictor). Kaplan-Meier curves were plotted by subsets according to history of preterm birth and/or abortion.

RESULTS

From ~33 million deliveries, ~43 thousand (1.3%) were triplets. After exclusion criteria & case:control matching, 567 cases & 567 controls were compared. Baseline data & outcomes are shown in the Table. Preterm delivery rates and complications were significantly higher in the cerclage group ($p<0.05$). Adjusted odds ratios showed increase risk of most perinatal complications (Figure). Survival curves showed lower undelivered rates in the cerclage group [log-rank $p<0.009$, HR (95%CI) = 1.2 (1.0 – 1.3)].

Table. Gestational Age at Delivery & Perinatal Outcomes after Cerclage Placement in Triplets vs. Controls (N=580)

	Cerclage N=567	Controls N=567	p-value [a]
	Cases (Percentage) / Median (IQR) [b]		
Baseline Data			
Maternal Age	33.0 (29.0 -36.0)	33.0 (30.0 - 36.0)	0.736
Maternal Race			0.041
Whites	460 (81.1)	428 (75.5)	
Blacks	78 (13.8)	108 (19.0)	
Native-American	2 (0.4)	0 (0)	
Asian	27 (4.8)	31 (5.5)	
Marital Status - Married	516 (91.0)	499 (88.0)	0.121
Smoking	10 (1.9)	10 (1.9)	1.000
Parity - Nulliparous	139 (24.5)	105 (18.5)	0.017
Outcomes			
GA @ Delivery [c]	31.0 (28.0 - 34.0)	32.0 (30.0 - 34.0)	<0.001
Preterm Delivery			
< 37 weeks	549 (96.8)	541 (95.4)	0.282
< 34 weeks	475 (83.8)	432 (76.2)	0.002
< 28 weeks	175 (30.9)	104 (18.3)	<0.001
< 24 weeks	69 (12.2)	36 (6.3)	0.001
PPROM	158 (27.9)	62 (11.0)	<0.001
Chorioamnionitis	23 (4.1)	11 (1.9)	0.054
Non-reassuring fetal status	26 (4.6)	16 (2.8)	0.156
Stained Meconium	7 (1.2)	8 (1.4)	1.000
Composite of Neonatal Complications	535 (94.4)	503 (88.7)	0.001
Birth Injury	0(0)	0 (0)	N/A

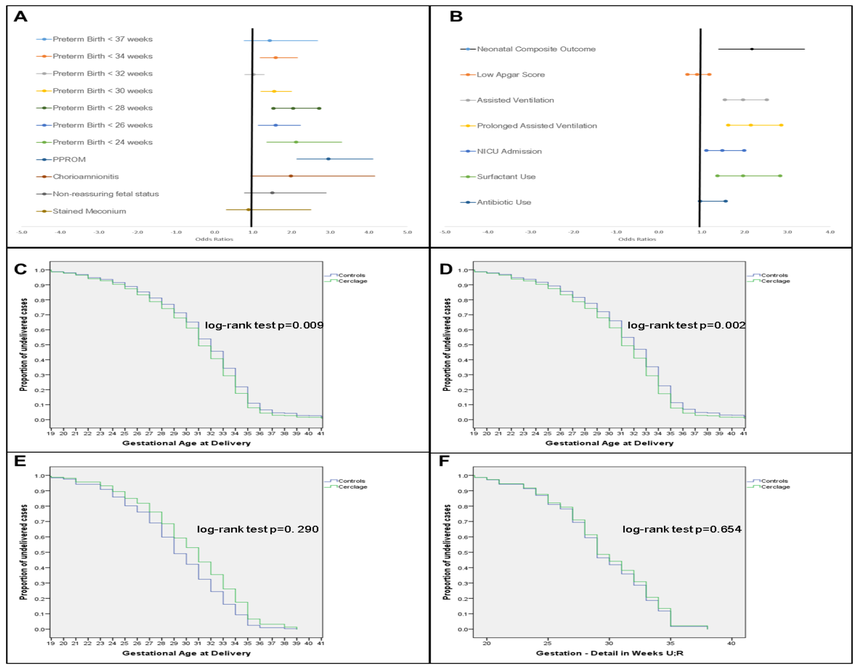
[a] Mann-Whitney U test (for non-parametric distribution data) or Pearson's/Fisher's chi-square test.

[b] Interquartile Range.

[c] Gestational Age at delivery.

[d] Not computable.

Figure. Gestational Age at Delivery and Perinatal Complications after Cerclage Placement in Triplet Pregnancies vs. matched Controls (N=1,134)



A & B. Adjusted Odds ratios for preterm birth (A) and neonatal complications (B) after cerclage placement in Triplet pregnancies vs. matched controls. C – E. Kaplan-Meier curves of proportion of undelivered cases according to gestational age of delivery in all cases (C), cases with prior abortions (D), cases with prior preterm births (E), and with both prior abortion and preterm deliveries (F).

CONCLUSION

Our study confirms that cerclage in Triplets neither decreases preterm birth rates nor improves perinatal outcomes. Cerclage seems to increase risks of adverse outcomes for these babies. Prospective studies are urgently needed to clarify these findings. Until such studies have been accomplished, data presented here should be considered for clinical decision making and patient counseling.