Delivery latency and placental cord insertion in preterm labor with singleton pregnancy

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Problem statement

Marginal and velamentous cord insertion are associated with increased risk of spontaneous preterm birth (PTB) that includes preterm labor (PTL) and preterm premature rupture of membranes (PPROM). A shorter transvaginal cervical length (≤ 2 cm) and amniotic fluid index (≤5 cm) independently predict delivery within 7 days in PPROM. The aim of this study was to determine whether peripheral insertion of umbilical cord (PIUC) is associated with short delivery latency in PTB with PTL and PPROM.

Methods

This study was conducted retrospectively in delivered women with singleton pregnancy between 24-42 weeks of gestation. 110 women were delivered < 37 weeks and 112 women were delivered at term (≥ 37 weeks). Velamentous cord insertion, twin, placenta previa, abruptio placenta, fetal anomaly, uterine anomaly, and PTB with medical and surgical indications were excluded. PIUC was defined ≤ 3 cm from placental edge. Multiple regression analysis was used for statistical analysis.

Results

Comparison of placental characteristics

	PTB (n=110)	Term (n=112)	P-value
Pl. to birth weight ratio	0.26±0.07	0.19±0.03	<0.001
Pl. the longest length (cm)	17.87±2.79	19.86±2.19	0.691
Pl. the shortest length (cm)	15.54±2.68	17.13±2.01	0.147
Pl. thickness (cm)	2.06±0.57	2.25±0.59	0.119
Cord insertion (cm)	4.02±2.28	4.96±2.57	0.207
PIUC (%)*	26 (40.6%)	24 (36.4%)	0.940
Cord length (cm)	38.70±12.70	43.49±12.08	0.354
Cord thickness (cm)	1.27±0.45	1.10±0.27	0.069

Multiple regression analysis between factors and delivery latency

Factors	β± SE	P-value
Cord insertion	3.551±1.439	0.017
Age	-0.183±0.571	0.750
Parity	-5.455±4.009	0.180
Cx length	1.355±3.270	0.680
Cx dilatation	-1.628±1.732	0.349
AFI	0.435±0.571	0.449
CRP	-0.319±2.145	0.882
Placenta to birth weight ratio	-0.050±37.162	0.999
Pl. the longest length	1.447±1.158	0.217
Pl. thickness	11.000±5.319	0.044
Cord length	-0.114±0.250	0.649
Cord thickness	6.734±6.664	0.317

Clinical characteristics in PTB

	PTB (n=110)	PTL (n=54)	PPROM (n=56)	P-value
Age (yrs)	31.67±5.16	30.47±5.51	32.64±4.88	0.099
Parity	0.61±0.70	0.44±0.62	0.73±0.76	0.068
Adm GA (weeks)	30.86±3.89	29.72±4.12	31.90±3.43	0.026
Del GA (weeks)	32.06±3.35	31.87±3.52	32.88±2.80	0.210
Delivery latency (day)	11.41±24.63	16.63±31.13	6.67±15.77	0.122
Adm Cx length (cm)	0.83±1.06	0.52±0.83	1.11±1.18	0.026
Cx dilatation (cm)	1.78±2.11	2.17±2.39	1.42±1.78	0.164
AFI (cm)	9.87±5.14	11.78±5.26	8.13±4.44	0.004
CRP (mg/dl)	0.77±1.33	0.76±1.44	0.77±1.25	0.988
Infant weight(g)	2006.4±684.0	1996.7±723.9	2098.2±594.9	0.544
pl. weight (g)	482.3±151.8	490.0±156.8	485.4±141.4	0.902
pl. to birth weight ratio	0.26±0.07	0.26±0.08	0.24±0.06	0.269
pl. the longest length (cm)	17.87±2.79	18.23±2.83	17.62±2.74	0.387
pl. thickness (cm)	2.06±0.57	2.02±0.48	2.07±0.66	0.718
Cord insertion (cm)	4.02±2.28	4.35±2.33	3.63±2.17	0.209
PIUC (%)	40.60%	30.00%	51.50%	0.083
Cord length (cm)	38.70±12.70	37.43±11.82	40.15±13.37	0.398
Cord thickness (cm)	1.27±0.45	1.33±0.46	1.22±0.42	0.337

Comparison between PIUC and non PIUC in PTB

	PIUC (≤3cm, n=47)	Non PIUC (>3cm, n=63)	P-value
Age (yrs)	31.62±6.03	31.59±4.63	.988
Parity	0.46±0.65	0.65±0.75	.308
Delivery latency (day)	3.00±3.68	9.82±17.2	.031
Cx length (cm)	1.03±1.21	0.68±0.93	.198
Cx_dilatation (cm)	1.73±2.4	1.81±1.91	.881
AFI (cm)	8.66±5.1	10.72±5.07	.119
CRP (mg/dl)	0.88±1.89	0.69±0.75	.588
Infant weight (g)	1937.69±547.25	2128.65±719.55	.259
Pl. weight (g)	474.04±121.89	497.08±164.45	.547
Pl. to birth weight ratio	0.26±0.07	0.25±0.08	.692
Pl. the longest length (cm)	17.25±2.35	18.38±2.99	.113
Pl. the shortest length (cm)	2.18±0.49	1.95±0.62	.126
Cord length (cm)	37.21±12.02	40.01±13.08	.390
Cord thickness (cm)	1.19±0.39	1.33±0.47	.219

Conclusion

PIUC was associated shorter delivery latency in preterm singleton pregnancy. Placental cord insertion site should be evaluated at ultrasonographic examination of women with preterm labor.