

The role of USCOM in predicting preterm delivery in women with threatened preterm delivery: a look into maternal cardiovascular maladaptation

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Objective. The aim of this study was to investigate maternal hemodynamic profiles in women with a diagnosis of threatened preterm delivery (TPD) distinguishing between those who delivered early and those who remained undelivered until term.

Materials and Methods. Sixty-one patients with a diagnosis of TPD were enrolled in this prospective observational cohort study and assessed with Ultrasound Cardiac Output Monitor (USCOM®). The subjects were divided into groups according to week of delivery. Group 1 included women who experienced preterm birth (n = 35/61) while Group 2 was comprised of women who delivered at term (n = 26/61). Women with a diagnosis of fetal growth restriction or hypertensive disorders were excluded. Evaluated maternal features were cervical length, urinary culture and vaginal swab results. Perinatal and neonatal outcomes were also evaluated. The study was approved by our local Ethics Committee and all participants gave their informed consent at enrolment.

Results. No differences were found based on maternal age, body mass index, gravidity and parity, positive urinary culture or vaginal swabs, cervical length and neonatal birth-weight percentile. Lower gestational age at delivery ($31.9 \pm$

3.5 vs 38.9 ± 1.4 , $p < 0.0001$), neonatal birth weight (1839.8 ± 643.5 vs 3129.2 ± 487.4 , $p < 0.0001$) and 1st and 5th minute Apgar scores (respectively 7.6 ± 1.7 vs 8.7 ± 0.9 and 8.7 ± 1.1 vs 9.6 ± 1.0 , $p < 0.0001$) were observed in Group 1 vs Group 2. Maternal hemodynamic data are shown in Table 1.

Conclusions. Among the women admitted for TPD the only discriminating factor between term and preterm delivery was an increased TVR in the preterm group. Increased TVR may possibly explain the higher lifetime cardiovascular risk described in preterm-delivering women.

Table 1.

Haemodynamic profile	Group 1	Group 2	p-value
	Preterm deliveries (n° 35/61)	Term deliveries (n° 26/61)	
Heart Rate (bpm)	86.51 ± 14.18	83.00 ± 12.96	0.32
Cardiac Output (L/min)	5.96 ± 1.51	6.20 ± 1.19	0.48
Stroke Volume (mL)	70.11 ± 19.45	76.04 ± 15.70	0.19
Total Vascular Resistance (TVR) (dynes x s/cm ⁵)	1220.80 ± 382.73	1094.00 ± 248.92	0.04