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The peripartum hemodynamic profile of singleton versus twin pregnancies in parturients delivering with spinal anesthesia and prophylactive phenylepherine drip measured by noninvasive cardiac output monitoring

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Background and Goal of the Study

Spinal anesthesia is considered gold standard anesthetic technique for cesarean deliveries (CD) but is associated with a high rate of hypotension. The recent international consensus recommends continuous prophylactic phenylephrine infusion (PPI) administered throughout CD titrated to blood pressure measurements to prevent hypotension. However little information is available on hemodynamic profiles of women with twin pregnancies as compared to singleton pregnancies perioperatively. Therefore, in this study we aim to compare maternal hemodynamic changes both intraoperatively and postoperatively with the use of the NICAS bio impendence monitor in healthy singleton versus twin parturients undergoing CD deliveries with spinal anesthesia with PPI.

Materials and Methods

After IRB approval and signed informed consent, healthy term women with either twin or singleton undergoing spinal anesthesia for uncomplicated CD were enrolled. The following data were collected - cardiac output (CO), strove volume (SV), mean arterial pressure (MAP), and total peripheral resistance (TPR). Measurements were measured at 5 time points: 1) before arrival in OR , 2) after spinal anesthesia with PPI, 3) after beginning of oxytocin infusion 4) in post anesthesia care room 5)24 hours postoperatively and 6) 48 hours postoperatively. All parturients received standardized spinal solution consisting of 12 mg hyperbaric, 20 mcg fentanyl and 100 mcg preservative-free morphine. PPI was administered was titrated to preserve blood pressure to 20% of baseline blood pressure and stopped at the end of surgery. Oxytocin was administered as a continuous infusion (20 units/ 1000cc Ringer lactate) at a rate of 100cc/hr.

Name	Singelton Mean±SD	Twins Mean±SD	*P value*
Baseline			
MAP (mmHg)	89±11	93±11	0.186
CO (l/min)	8.5±1.8	8.5±2.4	0.991
TPR (dyn*Sec/cm^5)	889±242	959±344	0.208
After spinal with PE			
MAP (mmHg)	93±13	98±14	0.105
CO (l/min)	7.7±2.5	7.6±2.2	0.776
TPR (dyn*Sec/cm^5)	1052±382	1122±366	0.389
At time of delivery with pitochin			
MAP (mmHg)	90±12	92±12	0.353
CO (l/min)	7.9±2.9	7.6±2.4	0.541
TPR (dyn*Sec/cm^5)	998±362	1099±471	0.219
About 1 hour after delivery			
MAP (mmHg)	83±12	91±13	0.006
CO (l/min)	6.0±1.8	5.2±1.6	0.033
TPR (dyn*Sec/cm^5)	1221±412	1555±578	<0.001
24 hours hour after delivery			
MAP (mmHg)	80±10	88±13	<0.001
CO (l/min)	7.3±2.0	6.2±2.0	0.027
TPR (dyn*Sec/cm^5)	957±308	1277±543	<0.001
48 hours hour after delivery			
MAP (mmHg)	82±9	88±13	0.005
CO (l/min)	7.1±1.9	6.5±1.6	0.125
TPR (dyn*Sec/cm^5)	982±282	1145±299	0.013

Results

One hundred thirty seven women singletons and 27 women twins competed the study. There were no significant differences between groups in age or BMI. . Intraoperatively there was no difference in any hemodynamic parameter. However postoperatively at all three times women with twin pregnancies had higher MAP, lower CO and higher TPR compared with parturients with singleton pregnancies

Conclusions

There were significant hemodynamic changes postoperatively but not intraoperatively in parturients with twin pregnancies compared to women with singleton pregnancies. These changes need to be studied further.