

Comparison of umbilical pH between subjects who had cesarean deliveries under general and regional anesthesia for the indication of fetal heart rate abnormalities: a single center retrospective study

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Introduction

- There are occasions where the benefits of immediate delivery of a fetus due to fetal heart rate abnormalities (FHRA) outweigh the risks of general anesthesia (GA)¹
- Primary aim of our study: compare umbilical blood gases between subjects who had regional anesthesia (RA) and GA as the initial anesthetic technique for cesarean delivery CD performed with the indication of FHRA

Methods

- We searched our electronic medical record for subjects who had cesarean deliveries from July 1, 2020 to June 30, 2021 who had an operative indication of FHRA.
- A study investigator entered data from our electronic medical record into REDCap.

Results

Table 1. Demographic and clinical data for subjects who had cesarean delivery for indication of fetal heart rate abnormality with a documented umbilical blood gas

	General anesthesia as initial anesthetic technique (N=19)	Regional anesthesia as initial anesthetic technique (N=74)	P value
Active COVID infection	1 (5.3%) ¹	2 (2.7%) ²	0.50
Cesarean delivery documented as “STAT” or “emergent”	11 (57.9%)	13 (17.6%)	<0.01*
Time of day of delivery			0.86
0700-1559	7 (36.8%)	29 (39.2%)	
1600-2359	8 (42.1%)	24 (32.4%)	
0000-0659	4 (21.1%)	21 (28.4%)	
Time from entering operating room to delivery in minutes (mean (SD))	17.3 (17.1)	32.8 (12.9)	<0.01*
Time from surgical incision to delivery in minutes (mean (SD))	2.1 (1.5)	6.4 (4.2)	<0.01*
Time from surgical incision to wound closure in minutes (mean (SD))	46.1 (15.5)	47.8 (15.1)	0.65
Umbilical blood gas pH	7.12 (0.19)	7.19 (0.10)	0.02*
1 minute APGAR score (median (IQR))	5 (1-8)	8 (5-8)	0.01*
5 minute APGAR score (median (IQR))	8 (6-9)	9 (8-9)	<0.01*

1.Mild infection, 2|One asymptomatic infection, one mild infection

- 166 subjects had FHRA during study period
- 19 of 21 subjects with GA had a documented umbilical blood gas
- 74 of 145 subjects with RA as initial technique had a documented umbilical blood gas
- 17 of 74 (23%) subjects with RA as initial technique had conversion to GA prior to delivery, 2 subjects had conversion to GA after delivery
- GA and RA cohorts did not differ in age, BMI, gravidity, parity, gestational age, or history of cesarean delivery

Regional anesthesia as initial technique added 15.5 extra minutes from entering OR to delivery

Discussion

- We found clinically and statistically significant differences in umbilical pH and APGAR scores at 1 and 5 minutes between subjects who had GA and RA as initial technique for CD that had an indication of FHRA
- Decision to proceed with GA is based on judgment of attending obstetrician who has to act in real time with imperfect data
- Limitations: subjects who received GA likely had fetuses with more distress compared to subjects who had RA and 17 subjects had RA as initial technique but required conversion to GA prior to delivery of infant
- Unanswered question: when is it better to proceed directly to GA rather than take 15 extra minutes to attempt RA with 23% failure rate?



References

1. Lim G, Facco FL, Nathan N, Waters JH, Wong CA, Eltzschig HK. A Review of the Impact of Obstetric Anesthesia on Maternal and Neonatal Outcomes. *Anesthesiology*. 2018;129(1):192-215. doi:10.1097/ALN.0000000000002182