General or neuraxial anesthesia: what is best choice for red code cesarean section?

Enrico **Corno** [1,*], Giuseppe **Marino** [2], Clara **Repossini** [2], Silvana **Papandrea** [2], **Francesca** Bonati [3], Armando **Pintucci** [4], Isabella **Maini** [5], Stefania **Fieni** [6], Tullio **Ghi** [1], Tiziana **Frusca** [1], Patrizia **Vergani** [2], Anna **Locatelli** [2]

[1] Obstetrics and Gynaecology Unit, Department of Medicine and Surgery, University of Parma, Parma, Italy.
[2] Department of Medicine and Surgery, University of Milano-Bicocca, Milan, Italy.
[3] Carate Hospital, ASST Brianza, Monza Brianza, Italy.
[4] Hospital of Desio, ASST Brianza, Monza Brianza, Italy.
[5] Hospital of Monza, FMBBM-ASST Monza, Monza Brianza, Italy.
[6] Obstetrics and Gynecology Unit, University Hospital of Parma, Parma, Italy.

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Objective. Red code (RC) cesarean section (CS) is an obstetrics emergency performed for immediate risk for the life of the woman or the fetus. We have assessed the role of anesthesia on obstetrics and perinatal outcomes in patients who underwent RC CS.

Materials and Methods. A multicenter retrospective cohort study in four maternity units including all cases of RC CS between January 2018 and December 2021. We collected medical and surgical reports, intrapartum fetal heart rate monitoring. Patients who underwent analgesia during labor were excluded. Outcomes were related to the anesthesiology technique utilized (general anesthesia - GenA *versus* neuraxial anesthesia - NeuraxA). Retrospective audits were performed by an expert obstetric team for assessment of appropriateness of indications for RC CS.

Results. From a total of 168 RC CS (3.5% of deliveries), 122 (72.4 %) cases were included. GenA (45.1%) was compared with NeuraxA (54.9%). While GenA was associated with a shorter decision-to-delivery interval (DDI) (p = 0.028) and better umbilical artery (UA) pH (p = 0.005), it was related to a greater blood loss (p = 0.006), UA base excess (BE) < -16 mmol/L (p = 0.013) and need for neonate reanimation (p = 0.028).

Moreover, on multivariate analysis, only appropriateness of indication for RC CS (p = 0.003) and GenA (p = 0.008) were independently related to a worse neonatal UA BE, while DDI was not significant (p = 0.53).

Conclusions. NeuraxA seems the preferential type of anesthesia during CR CS, because GenA is related to worse perinatal outcomes in terms of UA BE and neonatal reanimation and greater maternal blood loss.

	NEURAXIAL ANESTHESIA	GENERAL ANESTHESIA	MISSING	P-VALUE
Number of cases	67 (54.9%)	55 (45.1%)	0	/
Maternal anamnesis				
Maternal Age	32.49 (SD ± 5.8)	33.2 (SD ± 5.7)	0	0.503
BMI at delivery	28.2 (SD ± 4.3)	28.0 (SD ± 4.2)	18	0.844
Previous CS	6	10	4	0.133
Cefalic presentation	57	47	4	0.407
Comorblity	18	11	0	0.375
Gestational age at delivery	38.5 (SD ± 2.3)	37.4 (SD ± 4.7)	0	0.110
CS indications				
Sentinel event	25	24	4	0.478
Appropriateness	41	45	4	0.014
Timing				
Decision-to-incision interval (min)	19.08 (SD ± 11.6)	15.78 (SD ± 9.0)	5	0.089
Decision-to-delivery interval (min)	24.03 (SD ± 12.4)	19.31 (SD ± 10.7)	4	0.028
Maternal outcomes				
Blood loss (mL)	453.73 (SD ± 280.7)	725.47 (SD ± 726.4)	6	0.006
Blood trasfusion	0	3	4	0.053
Surgical complications	8	4	4	0.389
Neonatal outcomes				
UA pH	7.14 (SD ± 0.15)	7.22 (SD ± 0.16)	7	0.005
UA BE < 12	6	11	7	0.084
UA BE < 16	1	7	7	0.013
UA lactates > 7	11	11	11	0.601
Apgar score at 5min < 7	13	11	4	0.934
Neonatal reanimation	17	24	5	0.028
Neonatal inubation	10	12	5	0.301
Neonatal ICU access	9	15	4	0.056
Hypothermia	2	3	5	0.480