EFFECTS OF EPIDURAL AND INTRAVENOUS REMIFENTANIL ANALGESIA DURING LABOR ON NEONATAL OUTCOME – RETROSPECTIVE OBSERVATIONAL STUDY

Sobot Novakovic S¹, Cuk S¹, Lazic G¹, Rakanovic D¹, Banicevic Ceric A², Visekruna L³

University Clinical Center of Republic of Srpska, Department of Anesthesia and Intensive Care¹University Clinical Center of Republic of Srpska, Department of Gynecology and Obstetrics²University Clinical Center of Republic of Srpska, Department of Pediatrics³

BACKGROUND:

It is widely assumed that any pharmacological form of analgesia must have adverse effects on the baby, while unmodified labor is relatively harmless. Reports have linked epidural with a variety of adverse effects during labor and labor outcome indirectly affecting neonatal outcome. Variety of neonatal side effects were reported including jaundice, sepsis, depressed neurobehavioral testing. Systemic analgesia with opioids has been connected with neonatal side effects as lower Apgar scores, depressed respiration, muscle tone and suckling and lower neurobehavioral scores.

OBJECTIVE

We evaluated the clinical outcome of term neonates born to mothers who received epidural analgesia (E) or systemic analgesia with remifentanyl (R) during labor with aim to compare whether is one type of analgesia superior to another in term of neonatal outcome.

METHODS:

Data was collected retrospectively over the course of one year. We have evaluated the medical records of 247 full term neonates, 208 were born to mothers who received E and 39 to mothers who received R. Data on Apgar scores and perinatal complications (infection, sepsis, hyperbilirubinemia, perinatal injuries, asphyxia), and average hospital stay were collected. Mann-Whitney U test, chi square test, and logistic regression analysis were used where appropriate.

RESULTS:

Mean Apgar scores in 1st and 5th minute between E and R were similar (8.83 vs. 8.97 $P = 0.252$; 9.81 vs. 9.87, $P = 0.762$, respectively). Average neonatal hospital stay was not different between groups (4.19 vs. 4, $P = 0.557$). The percentage of neonates with any perinatal complication were similar between groups (28.3% vs. 32.5%, $P = 0.598$). Neonates born by cesarean delivery (CD) had statistically significant worse outcomes compared to neonates that were delivered vaginally (odds ratio 2.8 95%CI [1.30647–6.17692]).

CONCLUSIONS:

We did not find statistically significant difference in mean Apgar scores and perinatal complications between neonates who received epidural vs. remifentanyl analgesia. We measured an increased rate of complications in neonates born via CD. Fetal indications for CD may be a significant confounder explaining this finding. Future studies should have a greater sample size and be powered to detect such associations.

Figure 1. Neonatal Complications Frequency Compared to Type of Delivery

Table 1. Maternal Demographic Characteristics

	Epidural (n=208)	Remifentanyl (n=39)	P value
Maternal age	30.8	32.7	0.1354
Gestational week	39.4	39.5	0.3635
Maternal diseases**	31 (14.9)	8 (20.51)	0.378
Parity			
Primipara	135 (64.9)	29 (74.36)	0.251
Multipara	73 (35.1)	10 (25.64)	

*Data presented as mean, n (%)

**Maternal diseases included thrombophilia, PIH, preeclampsia, hypothyroidism, hyperthyroidism, thrombocytopenia, cardiac disease

Table 2. Neonatal Demographic Characteristic and Neonatal Outcomes

	Epidural (N=208)	Remifentanyl (N=39)	P value***
Birth weight	3563.3	3506.9	0.3620 ^x
Birth length	52.8	52.5	0.3735 ^x
Apgar score			
1 min	8.83	8.97	0.2523 [†]
5 min	9.81	9.87	0.7620 [†]
Apgar score <7 in 1st min	3	0	NC****
Apgar score <7 in 5th min	1	0	NC****
Neonatal Perinatal Complications*	59 (28.3)	13 (32.5)	0.598 [‡]
Infections	47(22.6)	8 (20.5)	0.774 [‡]
Hyperbilirubinemia	10 (5.13)	2 (4.8)	0.932 [‡]
Injuries	7 (3.3)	1 (2.5)	NC****
Intracranial hemorrhage and ischemia	2	1	NC****
Respiratory distress	1	0	NC****
Admission to NICU	5	0	NC****
Admission to observational neonatal unit	15 (7.2)	1 (2.5)	0.279 [‡]
Average hospital stay	4.2	4	0.5571 [†]

*Perinatal complications include infections, hyperbilirubinemia, injuries, perinatal asphyxia

**Data presented as mean, n (%)

***P values calculated with Student t-testx, Mann-Whitney† and Chi squared test‡

****NC – not able to calculate

Table 3. Labor Outcomes

	Epidural (N=208)	Remifentanyl (N=39)	P value**
Labor duration (min)	359.5	317.1	0.3752†
Vaginal delivery	181 (86.2)	35 (89.8)	0.535‡
Conversion to C section	28 (13.8)	4 (10.2)	
Indication for C section			
Fetal distress	9 (4.33)	3 (7.69)	0.000‡
Prolonged labor	11 (5.29)	1 (2.56)	0.111‡
Cephalopelvic disproportion	8 (3.85)	0	NC***

*Data presented as mean, n (%)

**P values calculated with Mann-Whitney test† and chi squared test‡

***NC – not able to calculate

References:

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