THE EFFECT OF DIFFERENT LOCAL ANAESTHETICS AND THEIR DOSES, USED FOR LABOUR PAIN RELIEF WITH PCEA, ON FOETUS: A RANDOMIZED DOUBLE BLIND CONTROLLED TRIAL

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Introduction

Epidural analgesia effectively relieves pain during labour, but controversy exists as to the effect of epidurals on mode of delivery and effects on the foetus and neonate.

Umbilical cord blood pH and lactates strongly correlate with neonatal morbidity and mortality.

Goal and objectives

The goal of the study was to evaluate the effect of different local anaesthetics (LA) and their doses, used for labour epidural analgesia, on foetus.

❑ To investigate the affect of LAs concentration, used for labour pain management with PCEA, on the mode of delivery.

❑ To find out the the rate of side effects for new-born when different doses of LAs are used epidurally.

❑ To evaluate the relation between LA concentration and umbilical cord blood pH.

Inclusion and exclusion criteria

Included:

Primiparas with term singleton cephalic pregnancy, age >18<40 year, who requested epidural analgesia and signed the written informed consent, ASA I-II, the dilation of cervix ≤5 cm, no contraindications for epidural.

Excluded:

Obesity (BMI>35kg/m²), gestational diabetes, hypertension, pre-eclampsia, eclampsia, HELLP syndrome, premature rupture of membranes (>18h), foetal growth retardation, stillborn or newborn with physical damage.

Materials and Methods

A randomized double blind controlled trial of healthy primiparas was carried at 2014 - 2016 in the Maternal unit of a teaching hospital. Labour pain was relieved with PCEA using LA and opioid fentanyl 2 mcg/ml. The randomisation plan was made. The patients were allocated into 6 groups : B1-bupivacaine (B) 0.0625%, B2-B 0.1%, B3- B 0.125%, L1-levobupivacaine (L) 0.0625%, L2 -L 0.1%, L3-L 0.125%. Umbilical cord gas was collected after delivery.

Data were analysed using SPSS 21.0 software. Kruskal-Wallis test was used to compare the means. Qualitative variables were compared using chi-squared test. Linear logistic regression was used to prognose the meaning. $P < 0.05$ was considered statistically significant.

Results

The number of patients included in the trial was 237. Nine patients were excluded according to study protocole because of insufficient labour pain relief, bleeding and new-born death.

Groups were similar according to ASA class($p=0.35$), age($p=0.41$), gestational age($p=0.78$), BMI($p=0.53$), duration of delivery stages (I,II) ($p=0.79$; $p=0.47$). Birth weight($p=0.35$) and Apgar score at 1 and 5 minutes($p=0.14$ and $p=0.76$) between groups doesn't differ.

The mode of delivery and new-born side effects

	Mode of delivery n (%)			Foetal bradycardia n (%)	Meconium in amniotic fluid n (%)	O2 request for newborn n (%)
	Vaginal	Instrumental	Caesarean			
B 0,0625%	31 (88.6)	0	4(11.4)	6(17.1)	5 (14.3)	1(2.9)
B 0.1%	38(88.4)	4(9.3)	1(2.3)	8(18.6)	8(18.6)	6(14)
B 0,125%	30(71.4)	1(2.4)	11(26.2)	10(23.8)	8(19)	4(9.5)
L 0,0625%	33(84.6)	1(2.6)	5(12.8)	4(10.3)	6(15.4)	2(5.1)
L 0,1%	28(71.8)	2(5.1)	9(23.1)	8(20.5)	8(20.5)	7(17.9)
L 0,125%	33(84.6)	0	6(15.4)	3(7.7)	6(15.4)	0
χ²	19.16			5.54	0.84	11.88
p	0.04			0.353	0.97	0.04

B – bupivacaine; L - levobupivacaine

Proper umbilical cord blood gas samples were taken for 162 (69.6%) patients. Umbilical cord gas pH and lactates between groups were similar ($p=0.09$).

The correlation between total dose of local anaesthetics and umbilical cord gas pH is weak, but significant ($r=-0.18$; $p=0.02$). Linear logistic regression revealed that when total dose of local anaesthetic increases 10 mg, that determines decrease of umbilical cord blood pH in 0.04 ($B=7.3$; $p=0.03$). And dose limit of LA, when influence to umbilical cord blood pH appears, is 62.19 mg.

Conclusions

- ❑ Increasing dose of local anaesthetics affects mode of delivery
- ❑ Local anaesthetic concentration doesn't affect the rate of new-born side effects.
- ❑ Increasing dose of local anaesthetic increase foetal acidosis.