Clinical observation of ropivacaine compuled with sufentanil for painless childbirth

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Abstract: This study aimed to explore the effect of ropivacaine combined with sufentanil on maternal lactation and infant, which were used by different anesthesia method for painless childbirth. 284 cases of voluntary acceptance of painless childbirth pregnant were involved in this study and divided into control group and observation group. Ropivacaine combined with sufentanil epidural anesthesia (CEA) was used in the control group, and ropivacaine combined with sufentanil epidural block (CSEA) anesthesia was used in the observation group. Meanwhile, maternal colostrum time, postpartum lactation and neonatal Apgar score were analyzed. The colostrum time of the observation group was significantly shorter than that in the control group and the lactation quantity of 24h was significantly higher than that in the control group. There were significant differences between the control and the observation groups ($P<0.05$). However, there was no significant difference in neonatal Apgar score ($p>0.05$). Combined spinal epidural anesthesia of ropivacaine combined with sufentanil is more conducive to the early postpartum lactation compared with epidural anesthesia. And both of the two ways of anesthesia had no effect on the neonatal Apgar score.

Keywords: Ropivacaine; sufentanil; painless childbirth; lactation.

INTRODUCTION

Delivery mode could affect the maternal postpartum lactation (Kornelsen, 2005). And it also have some impact on the newborn. The painless of uterine contraction, fear, and nervous during natural childbirth could stimulate the sympathetic nerve which would inhibit the secretion of prolactin and early breast feeding (Dewandre *et al*., 2008; Frame, 1961) .At present, painless labor has been widely used in clinical. Sufentanil is a potent opioid analgesics which had rapid onset and long duration of analgesic action (Dewandre *et al*., 2010). It could across the blood brain barrier and combined with plasma protein (Minkowitz, 2007). Ropivacaine is a new long-acting amide class of local anesthetics. It had many characteristics such as sensory-motor nerve block separation, low toxic to the cardiovascular system and central nervous system (Bundscherer *et al*., 2015; Minkowitz, 2007). Therefore, they are widely used in the painless childbirth. In this paper, we aimed to study the effect of ropivacaine- sufentanil epidural anesthesia and combined spinal block anesthesia on maternal lactation and infant.

MATERIAL AND METHOD

248 cases of voluntary acceptance of painless childbirth pregnant from march 2012 to December 2014 in the hospital were selected in this study. Inclusive Criteria: (1) all the cases were obstetric clinics term, cephalic, singleton pregnancies (2) Prenatal care during pregnancy were normal (3) pregnant women and their family members are informed, cooperated with the study. Exclusion criteria: (1) pregnant women who had breast feeding taboo (2) pregnant women had analgesic, sedative drug allergies and addiction history. The patients were divided into observation and control group according to the order of treatment. In the observation group, there were 82 cases primipara and 42 cases pluripara; pregnancy week (37-42 weeks); age (22-36). Among control group, there were 86 cases primipara and 38 cases pluripara; pregnancy week (37-41 weeks); age (20-37). There was no significant difference between the 2 groups of women in the age of pregnancy and other general information ($P>0.05$).

Methods

After entering the clinical delivery, the routine monitoring and fetal monitoring were performed for all the women. The changes of vital signs were closely observed. Upper extremity venous channel was established within 3-4cm of the cervix. The Ringer's solution was infused and conventional low-flow nasal cannula oxygen was treated for the patients. The left lateral decubitus position, hands clinging to the knee and mandibular close to the chest to be the buckling shape was taken for the delivery woman. For the observation group, ropivacaine combined with sufentanil epidural block (CSEA) anesthesia was used. Sufentanil citrate (Yichang human well Pharmaceutical Co., Ltd. Batch number: NMPN: 20003688, standard: 10ml, 0.5mg) was diluted from 50ug/ml to 0.4ug/ml and then slowly injected into the subarachnoid space after the success of L3-4 spinal puncture, which would see the cerebrospinal fluid once the puncture was successful. At the same time, the 3-4 cm of epidural catheter was set at the pretext end Total 100ml of 0.08% ropivacaine

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hydrochloride (produced by Astra Zeneca, Drug approval number: 20020249) combined with the 0.4g/ml sufentanil citrate were injected into the guide tube within 15min. Once the palace mouth was completely open, the medicine was immediately stopped. As for the control group, ropivacaine combined with sufentanil epidural anesthesia (CEA) was used. 3ml of 2% lidocaine hydrochloride (Beijingzizhu Pharmaceutical Co., Ltd. Batch number: NMPN: H11022388) was injected after successful puncture. of the stent Set the epidural catheter about 4ml at the pretext end and observed it for 5min. Total 10ml of 0.1% ropivacaine hydrochloride combined with the 2g/ml sufentanil citrate were injected into the guide tube if there was no subarachnoid block and local anesthetic drug poisoning symptoms. The maternal pain symptoms were observed and the medicine was used for twice time if there was no significant improvement (Stratmann *et al*., 2005).

Observed indicator

Maternal colostrum time, postpartum lactation within 24h and the Apgar score of newborn after 15,10 min of born time

Evaluation criterion

Evaluation criterion of postpartum lactation: Enough milk: Breast-feed times in 24h and neonatal urination times were more than 6 times, and there are more than 1 times enough amount or 3~5 times less amount of soft stool. The newborns could sleep more than 3H after breast-feeding. Proper amount of milk: Breast-feed times in 24h and neonatal urination times were less than 6. The newborn infant could sleep after feeding a small amount (less than 30ml) of milk. Milk deficiency: breast-feed times in 24h and neonatal urination times were less than 5.The newborn infants would not sleep until they were fed right amount of powdered formulas (>30ml). Effective postpartum lactation= (Enough milk+ Proper amount of milk)/cases*100%.

STATISTICAL ANALYSIS

All data were assessed by SPSS 21.0 program. The quantitative data was tested by T test with each group and represented by (x±S). The enumeration data was tested by x2 test and given by [n(%)]. Differences were considered to be statistically significant at $P<0.05$.

RESULTS

Maternal colostrum time

The maternal colostrum time was (28.24±13.80) h and (32.58±10.33) h respectively for observation group and control group. The results showed that there was significant difference between the two group ($p<0.01$).

Postpartum lactation within 24h

The results of postpartum lactation within 24h were shown in table 1. The effective postpartum lactation of observation group was significantly higher than that in the control group and the difference was thought to be statistically significant ($p<0.05$).

The Apgar score of newborn

The results of the Apgar score of newborn after 15,10 min of born time were revealed in table 2. There was no significant difference in Apgar score of newborn between the two group.

DISCUSSION

Painless childbirth is also known as labor analgesia (Caton, 2002). The impact of painless childbirth on maternal and children has been the focus of research with the widely application in clinical practice(Sapsford *et al*., 2006). Ropivacaine was a long-acting amide local anesthetics, it could block the excitability and conduction of nerve by inhibiting neuronal sodium channels (Lundgren, 2005). But it had low systemic toxicity due to the low affinity to the sodium channels of myocardial cell (Tam *et al*., 2015). The delivery women could keep normal physical activity by using ropivacaine for labor analgesia which is conducive to the acceleration of cervical dilatation and shortening of the first stage of labor (Ulutas *et al*., 2015); Sufentanil was a kind of opioid drugs and had potent analgesic effect compared with fentanyl. The drug could ensure adequate myocardial

Table 1: Comparison of postpartum lactation within 24h

Group	Cases	Enough milk	Proper amount of milk	Milk deficiency	Effective postpartum lactation
Observation group	124	42 (33.87)	62 (50.00)	20 (16.13)	104 (83.87)
Control group	124	38 (30.65)	51 (41.13)	35(28.23)	89 (71.77)

Note: Compared with control group, *p<0.05

Table 2: The Apgar score of newborn after 15,10 min of born time (x ± S)

Groups	Cases	1min	5min	10min
Observation group	124	9.5±2.5	9.5±2.5	9.5±1.8
Control group	124	9.4±2.6	9.5±2.4	9.5±2.6

oxygen supply and had good hemodynamic stability (Caton, 2002; Lundgren, 2005).

In this study, we explored the effect of ropivacaine combined with sufentanil on maternal lactation and infant, which were used by epidural anesthesia and combined spinal block anesthesia. The results showed that the colostrum time in the observation group was significantly shorter than that in the control group, and the amount of postpartum lactation within 24h was significantly higher than that in the control group ($p<0.05$) which demonstrated that ropivacaine combined with sufentanil by spinal epidural block anesthesia could significantly shorten the time of maternal colostrum and improve milk yield compared with epidural anesthesia. However, the Apggr score of newborn after 15,10 min of born time had no significant difference between the two group, it indicated the anesthesia method had on effect on the newborn. In summary, ropivacaine combined with sufentanil by spinal epidural anesthesia was more beneficial to early lactation compared with epidural anesthesia. While the Apgar score of neonates were not affected by the two anesthesia methods.

REFERENCES

Bundscherer A, Malsy M, Gebhardt K, Metterlein T, Plank C, Wiese CH, Gruber M and Graf BM (2015). Effects of ropivacaine, bupivacaine and sufentanil in colon and pancreatic cancer cells *in vitro*. *PR*, **95**: 126-131.

Caton D (2002). Anesthesia for childbirth: Controversy and change. *AJOG*, **186**: S25-S30.

Dewandre PY, Decurninge V, Bonhomme V, Hans P and Brichant JF (2010). Side effects of the addition of clonidine 75 microg or sufentanil 5 microg to 0.2% ropivacaine for labour epidural analgesia. *IJOA*, **19**: 149-154.

Dewandre PY, Kirsch M, Bonhomme V, Columb M, Hans P and Brichant JF (2008). Impact of the addition of sufentanil 5 microg or clonidine 75 microg on the minimum local analgesic concentration of ropivacaine for epidural analgesia in labour: A randomized comparison. *IJOA*, **17**: 315-321.

Frame AM (1961). The psycho prophylactic method of painless childbirth 1 1Part of a lecture-demonstration, the Royal Melbourne Hospital. *Australian Journal of Physiotherapy*, **7**: 72-78.

Kornelsen J (2005). Essences and imperatives: An investigation of technology in childbirth. *Social Science & Medicine*, **61**: 1495-1504.

Lundgren I (2005). Swedish women's experience of childbirth 2 years after birth. *Midwifery*, **21**: 346-354.

Minkowitz HS (2007). Fentanyl iontophoretic transdermal system: A review. *TRAPM*, **11**: 3-8.

Sapsford RR, Richardson CA and Stanton WR (2006) Sitting posture affects pelvic floor muscle activity in parous women: An observational study. *AJP*, **52**: 219-222.

Stratmann G, Gambling DR, Moeller-Bertram T, Stackpole J, Pue AF and Berkowitz J (2005). A randomized comparison of a five-minute versus fifteen-minute lockout interval for PCEA during labor. *IJOA*, **14**: 200-207.

Tam KW, Chen SY, Huang TW, Lin CC, Su CM, Li CL, Ho YS, Wang WY and Wu CH (2015). Effect of wound infiltration with ropivacaine or bupivacaine analgesia in breast cancer surgery: A meta-analysis of randomized controlled trials. *International Journal of Surgery*, **22**: 79-85.

Ulutas M, Secer M, Taskapilioglu O, Karadas S, Akyilmaz AA, Baydilek Y, Kocamer B, Ozboz A and Boyaci S (2015). General versus epidural anesthesia for lumbar microdiscectomy. Journal of Clinical Neuroscience: *OJNSA*, **22**: 1309-1313.