INTERNATIONAL JOURNAL OF OBSTETRIC ANESTHESIA 17 (2008) 15–19

available at www.sciencedirect.com

ScienceDirect

IJOA

Original Article

Comparison of epidural analgesia with combined spinal-epidural analgesia for labor: a retrospective study of 6497 cases

M. Miro, E. Guasch, F. Gilsanz*

Department of Obstetric Anesthesia, Madrid Autónoma University, Hospital Universitario Maternal La Paz. Madrid, Spain

Keywords:
Epidural analgesia
Combined spinal-epidural analgesia
Labor analgesia

Background: Combined spinal-epidural analgesia provides rapid-onset analgesia with minimal motor block, but it is a more invasive technique than epidural analgesia and the risk of complications may be increased. This study compared the safety and effect on delivery of combined spinal-epidural and epidural analgesia in labor.

Methods: A retrospective observational study was performed. Data were collected from 6497 women who received regional analgesia in our tertiary hospital in 2005. The incidence of complications during labor and the day after delivery was compared. The effect on labor outcome with both techniques was also assessed.

Results: 1964 received combined spinal-epidural (30.2%) and 4533 epidural analgesia (69.8%). Quality of analgesia was better in the combined spinal-epidural group. Labor outcome was similar in the two groups. Pruritus, paresthesia and back pain were more frequent in the combined spinal-epidural group. No differences were observed in the incidence of accidental dural puncture or post dural puncture headache.

Conclusions: We found that epidural and combined spinal-epidural analgesia were comparable in terms of safety, and had a similar effect on delivery type.

Introduction

Ideally obstetric analgesia produces effective pain relief with minimal side effects for both mother and baby. Furthermore it should not affect the progress of labor. Combined spinal-epidural (CSE) analgesia offers the advantages of both epidural and spinal techniques while minimizing some of their side effects.[1] It provides rapid onset analgesia and improves analgesic quality.[2] Moreover, the CSE technique reduces local anesthetic dosage producing minimal motor block and increasing maternal satisfaction.[1,3] However, as CSE is a more invasive technique the risk of infectious complications and headache may be increased. Its influence on delivery type compared with epidural analgesia is likewise unclear.

In the present study we compared CSE with epidural analgesia looking at the incidence of complications and the effect on delivery in a tertiary university hospital, a unit with over 10,000 deliveries a year, in which over 90% receive regional analgesia in labor.

Methods

A retrospective observational study was performed. Following local Ethics Committee approval data were collected from documentation of epidural and CSE

M Miro, Resident, **E Guasch**, Staff Physician, **F Gilsanz**, Head of Service and Professor, Department of Obstetric Anesthesia, Madrid Autónoma University, Hospital Universitario Maternal, La Paz. Madrid, Spain.

* *Correspondence to*: Miguel Miró Murillo, Paseo de la Habana 134A-7B, 28036, Madrid, Spain. Tel.: +0034696480258. E-mail: mmiromurillo@hotmail.com.

0959-289X/$ - see front matter

doi:10.1016/j.ijoa.2007.07.003

techniques performed during labor in 2005 in a tertiary university hospital.

Epidural and CSE protocol

All blocks were performed in the sitting position. Monitoring during the procedure included pulse oximetry, ECG, and fetal cardiotocography. The epidural space was located at the L3-4 interspace using loss of resistance to air. In both groups a 3-mL epidural dose test of 0.25% bupivacaine with 1:200 000 adrenaline was given through the epidural catheter. In the epidural group, after the dose test, an 8-mL dose of 0.2% ropivacaine with fentanyl 50 μg was administered through the epidural catheter. This was followed by patient-controlled epidural analgesia (PCEA) using 0.12% ropivacaine with fentanyl 1.2 μg/mL. Boluses of 6-8 mL were available every 20-30 min and a background infusion was set at 6-8 mL/h by the attending anesthesiologist. In the CSE group a needle-through-needle technique was performed with 1 mL of isobaric 0.25% bupivacaine with fentanyl 20 μg injected intrathecally. This was followed by the same PCEA protocol as in the epidural group.

Data collection

A data-collection sheet was completed for all patients receiving regional analgesia. Data included patient characteristics, progress of labor at the time of insertion and mode of delivery. Complications during insertion such as vascular puncture, accidental dural puncture (ADP) and paresthesia were noted. The quality of analgesia and complications during labor including pruritus, nausea and vomiting, incomplete or patchy analgesia, pain at delivery and ineffective analgesia requiring epidural catheter replacement were noted. Post-partum complications such as headache, back pain and urinary retention were recorded by an anesthesiologist 24 h after labor.

Statistical analysis

Data were analyzed using the SPSS statistical package. Patient characteristics, anesthesiologist's experience, progress of labor at the time of insertion, mode of delivery and complications at insertion, during labor and in the immediate post-partum period were analyzed. Univariate analysis was first performed on each variable for comparison between the two techniques. Student's t test was used for continuous quantitative variables, Mann-Whitney U test for ordinate quantitative variables, Fisher's test for dichotomic qualitative variables, χ^2 test with Bonferroni correction for multiple comparisons for nominal qualitative variables. A P value of <0.05 was taken to indicate statistical significance, except in the last test where a value of <0.008 was used. When the univariate study identified statistically significant differences between the two techniques, a multivariate analysis (stepwise logistic regression) was used to detect the existence of confounding factors capable of accounting for observed differences.

Results

A total of 6518 women were initially studied. Data from 21 women were incomplete or lost and were not included in the analysis. The study therefore comprised 6497 women, of whom 1964 (30.2%) received CSE and 4533 (69.8%) epidural analgesia.

Patient characteristics are shown in Table 1. Women who received CSE were more likely to be multiparous and in more advanced labor than those in the epidural group. The experience of the anesthesiologist performing the procedure is shown in Table 2.

Table 3 gives the complications during the procedure. Stepwise logistic regression analysis revealed that paresthesia was more common with CSE analgesia [OR = 1.21 (1.07-1.37)], advancing maternal age [OR = 1.01 (1.00-1.02)] and operator inexperience, the incidence being higher in first year residents [OR = 2.07 (1.83-2.34)] and in second-third year residents [OR = 1.68 (1.40-2.00)] than among the more experienced. A greater proportion of women in the epidural analgesia group than in the CSE group had emetic symptoms, but logistic regression demonstrated that this difference was less in more advanced labor [OR = 0.81 (0.73-0.88)] and analgesic technique was not a significant factor. The most significant factor for developing pruritus was the use of CSE analgesia [OR = 2.15 (1.79-2.57)].

Results for quality of analgesia and labor outcome are shown in Table 4. Fewer women in the CSE group had ineffective analgesia requiring catheter replacement. To analyze differences in labor outcome, multiple comparisons were made using the Bonferroni correction. This revealed more spontaneous deliveries amongst those in the CSE group, but with stepwise logistic regression analysis, parity [OR = 2.10 (1.82-2.42)] and cervical dilatation at initiation of analgesia [OR = 1.13 (1.06-1.21)] were found to be predictive for spontaneous delivery and analgesic technique was not significant.

Table 1 Patient characteristics

	Epidural group n = 4533	CSE group n = 1964	P value
Weight (kg)	73.5 ± 11.4	73.3 ± 10.7	0.573
Height (cm)	162.4 ± 6.6	162.4 ± 6.7	0.737
Age (years)	30.3 ± 5.3	30.8 ± 5.3	<0.001
Multiparous(%)	1533 (34.4)	1009 (52.1)	<0.001
Gestational age (weeks)	38.9 ± 1.8	38.9 ± 1.8	0.723
Cervical dilatation at insertion (cm)	3	5	<0.001

Data are mean +SD except parity number (percent) and cervical dilatation (mode).