

The relationship of combined spinal-epidural analgesia and low-back pain after vaginal delivery

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ÖZET

Vajinal doğum sonrası görülen bel ağrısının kombine spinal-epidural analjezi ile ilişkisi

Bu çalışmada, kombine spinal-epidural analjezi uygulamasının vajinal doğum sonrası görülen bel ağrısı insidansına etkisini araştırmayı amaçladık. Çalışmaya 198 hasta alındı. Hastalar, doğum analjezisi tercihlerine göre iki gruba ayrıldı. Birinci gruba, oturur pozisyonda kombine spinal-epidural analjezi uygulandı (CSE grubu, n=104). İkinci grup ise kombine spinal-epidural analjezi uygulanmasını istemeyen hastalardan oluşturuldu (non epidural grup, n=94). Hastalara doğumdan bir gün, üç gün, bir ay ve altı ay sonra bel ağrıları ya da bununla ilişkili bir semptomları bulunup bulunmadığı soruldu. Toplam 60 adet, doğumdan sonra başlamış bel ağrısı hastası belirledik (CSE grubunda 32 ve non-epidural grupta 28 adet). Uzun dönem takipte gruplar arasında anlamlı bir fark belirlemedik. Sonuç olarak, kombine spinal-epidural analjezi, doğum sonrasında görülen bel ağrısı sıklığında bir artışa yol açmamaktadır.

Anahtar kelimeler: Doğum, bel ağrısı, kombine spinal-epidural

SUMMARY

In this study, we aimed to determine the effects of combined spinal-epidural block on low back pain incidence after vaginal delivery. 198 patients included into the study. Patients were separated into two groups regarding labor analgesia request. Combined spinal-epidural analgesia was performed in sitting position for the first group (CSE Group, n=104). The second group consisted of women who had chosen not to have CSE (non-epidural group, n=94). The patients were asked for low-back pain and other symptoms related to it on the first day, third day, one month and sixth months after the delivery. Totally, we determined 60 new onset low back pain cases after the delivery (32 in CSE and 28 in non-epidural group). We didn't establish any significant differences during long-time follow-ups between the groups. We concluded that, combined spinal-epidural analgesia could be performed safely without increasing the backache incidence after delivery.

Key words: Labor, low-back pain, combined spinal-epidural

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Introduction

Low back pain is a common problem. It can be caused by inflammation, infection, development abnormalities, and mechanical and degenerative disorders. Pregnancy and childbirth are also causes and studies have shown that fifty percent of women suffer low back pain in the postpartum period (Carlson et al. 2003, MacEvilly and Buggy 1996) and 10-25 % of women with permanent low back pain relate their symptoms to pregnancy (Kristiansson et al. 1996, Svensson et al. 1990). The increase in use of regional methods in the labour wards has led to a discussion of possible effects on the incidence of postpartum low back pain of epidural, spinal, and combined spinal-epidural block (CSE) (Ostheimer 1997). The current literature contains studies both supporting and refuting the association between epidural analgesia and low back pain after birth.

The normal physiological changes in pregnancy may cause low back pain in pregnancy and postpartumly via the mechanical and structural changes in the skeletal and vertebral systems. Retrospective studies (Russel and Groves 1993, MacArthur et al. 1990) investigating low back pain resulting from epidural analgesia suggest a combination of immobility, muscle relaxation secondary to epidural block and weak posture which might contribute to the resultant low back pain. However, no association between epidural analgesia and permanent low back pain has been found in any prospective studies (MacArthur et al. 1997, Russell and Dundas 1996, MacArthur et al. 1995, Breen et al. 1994). This study was designed to compare the incidence of postpartum new onset low back pain in women having combined spinal-epidural analgesia with a group in which combined spinal-epidural analgesia was not performed.

Material and Method

After obtaining approval of the faculty ethics committee (18/09/2004 - No: 10556), and written consent from the patients 198 women planned for vaginal delivery in the Gynecology and Obstetrics Clinic and classified as class I or II according to the criteria of American Society of Anesthesiologists (ASA), included in this study.

Inclusion criteria were pregnant with 37-42 weeks of gestation, complicationsfree pregnancy,

no history of spinal surgery, cardiac failure or allergy to anesthetics or opioids.

Ages, weight gain during pregnancy, parity, fetal weight, educational status (primary school, high school, university) of the patients were recorded.

The cases were allocated according to their analgesic preferences. Combined spinal-epidural analgesia was given to women in the CSE group (n=104). Before establishing the block, 10 ml/kg Ringer Lactate solution was given. Under a sterile procedure, the epidural space was entered via the L3-L4 or L4-L5 interspace with a 17 gauge Tuohy needle, employing loss of resistance to air. A 25 gauge spinal needle inserted through the Tuohy needle to reach the subarachnoid space. After checking out the free cerebrospinal fluid, 0.5 ml (2.5 mg) bupivacaine and 0.5 ml (25 mg) fentanyl in 2 ml saline injected into the subarachnoid space. The spinal needle removed and the epidural catheter advanced and fixed 3-4 cm inside the epidural space. Pain was measured with 10-point visual analogue scale (VAS, 0-10; 0: No pain, 10: Worst pain imaginable). When pain was first experienced and VAS score higher than 3, 3 ml bupivacaine and 50 mg fentanyl was prepared in a 10 ml saline solution, of which 5 ml was administered via the epidural catheter. If analgesia was not restored within 5 minutes (VAS score higher than 3), the remaining dose administered via the same catheter. This protocol continued until the end of the birth. Site of the puncture (L₃-L₄, L₄-L₅), the number of attempts required for successful block, degree of the difficulty of procedure regarding the attempt number for a successful block (easy, moderate, difficult), the ease of interspinous palpation regarding to possibility of spinous process palpation (easy, moderate, difficult), paresthesia elicited during the procedure, operator's experience (fellow [specialist in anesthesiology and reanimation], resident [4 or 5 years assistant doctor in anesthesiology and reanimation]) were recorded.

The second group of women had chosen not to have CSE (non-epidural group).

Low back pain was inquired at 24 hours after delivery. Patients complaining of low back pain asked about the onset time of the pain (before pregnancy, during pregnancy, after pregnancy). Patients also interviewed by telephone at the 3rd day, 1st month and 6th month.

The data evaluated in our Biostatistics Department Laboratory. SPSS 13.0 statistical package program

Table 1: Demographic characteristics of the groups.

	CSE (n=104)	Non-epidural (n=94)
Age (year)	24.3 ± 5.3	23.5 ± 4.7
Fetal weight (gr)	3456 ± 398	3439 ± 403
Number of birth (primiparous/multiparous)	56/48	52/42
Weight gain during pregnancy (kg)	9.2 ± 1.6	10.1 ± 1.8
Educational status (primary/high/university)	18/52/34	14/47/33

CSE: Combined spinal-epidural

Data were given as mean ± SD or case number (n).

Table 2: Incidence of low-back pain.

	1st Day	3rd Day	1st Month	6th Month
CSE (n = 60)	39 (32%)	37 (30%)	33 (27%)	17 (14%)
Non-epidural (n = 63)	46 (37%)	42 (34%)	38 (31%)	26 (21%)

CSE: Combined spinal-epidural

Data were given as case number (n) and %.

used in the statistical evaluation of the data. Mann-Whitney U test applied for comparison of the two groups; Pearson Chi-square test and Fisher's Chi-Square test applied for the examination of categorical data. $p < 0.05$ regarded statistically significant.

Results

There were 104 women in the CSE group and 94 in the non-epidural group, and no differences were detected in demographic data between the two groups (Table 1). Postpartum low back pain

Table 3: Demographic characteristics of women with and without low-back pain

	With pain (n=123)	Without pain (n=75)
Age (year)	28.2 ± 4.5	27.3 ± 4.9
Fetal weight (gr)	3273 ± 619	3112 ± 700
Number of birth (primiparous/multiparous)	52/71*	39/55
Weight gain during pregnancy (kg)	10.3 ± 2.1	9.8 ± 1.7
Educational status (primary/high/university)	30/47/46	22/24/29

* $p < 0.05$ for multiparity vs primiparity

Data were given mean ± SD or case number (n).

Table 4: Incidence of new onset low-back pain after delivery

	1st Day	3rd Day	1st Month	6th Month
CSE (n:32)	20 (33%)	20 (33%)	19 (32%)	8 (13%)
Non-Epidural (n:28)	15 (25%)	16 (26%)	15 (25%)	8 (13%)

CSE: Combined spinal-epidural

Data were given as case number (n) and %.

Table 5: Factors possibly associated with low back pain in the combined spinal-epidural group.

	1st Day (n:39)	3rd Day (n:37)	1st Month (n:33)	6th Month (n:17)
Level				
(L3-4/L4-5)	26/13	26/11	23/10	12/5
Multiple procedure	10 *	7	8	3
Difficult procedure	17 *	17 *	12	8
Difficult palpation	22	21	15	9
Paresthesia	13 *	8	9	5
Performer				
(F/R1/R2)	7/19/13	7/18/12	6/18/9	3/10/4

F: Fellow, R1: Resident (5 years), R2: Resident (4 years)

* $p < 0.05$

was complained of in 123 of the 198 cases; 60 in the CSE group and 63 in the non-epidural group (ns) (Table 2). There were no significant differences in demographic data between these except that postpartum low back pain was significantly more common in multiparous women ($p < 0.05$; Table 3).

New onset low back pain developing after pregnancy was present in 60 cases; in 32 women in CSE group and in 28 women in non-epidural group (n.s.). There was no difference in the incidence of new onset low-back pain between groups at first day, third day, one month and six months after delivery (Table 4). Factors possibly associated with new onset low back pain in the combined spinal-epidural group are shown in Table 5. Paresthesia during the CSE procedure, difficulty in locating the epidural space, and multiple attempts were overrepresented ($p < 0.05$).

Discussion

We investigated the association between postpartum low back pain and combined spinal-epidural analgesia in 198 vaginal deliveries, of which CSE was given in 104 cases. The incidence of postpartum low back pain in previous studies is 10%-67% (Kristiansson et al. 1996, Ostgaard and Andersson 1992); in ours it was 62%. 60 cases (49%) were in the combined spinal-epidural group and 63 (51%) in the non-epidural group (n.s.). New onset low back pain was developed

in 60 of these 123 cases; 32 (26%) in the CSE group and 28 (23%) in the non-epidural group (n.s.). A previous study has similarly failed to find a relationship between spinal analgesia and low back pain (To 2003).

Many factors may cause postpartum low back pain. Weight gain during pregnancy (Palot and Jolly 1995, Breen et al. 1994), the number of previous births (Palot and Jolly 1995, Ostgaard and Andersson 1992), fetal weight, pregnancy at an early age (Breen et al. 1994, Raoul and Anat 1994), educational status, epidural analgesia, presence of low back pain before or during pregnancy (Ostgaard and Andersson 1992), have all been suggested and also refuted (Leighton and Halpern 2002, Russell and Dundas 1996, Ostgaard and Andersson 1991, Fast et al 1990, Berg et al 1988). In the present study there was no relation between postpartum low back pain and the above factors. However, we found a significant correlation with multiparity.

Low back pain before and during pregnancy is a major risk factor for pain in the postpartum period (To and Wong 2003, MacArthur et al. 1997, Russell and Dundas 1996, Palot and Jolly 1995, Breen et al. 1994, Raoul and Anat 1994). In our study, 23 (19%) cases had low back pain before pregnancy and 40 (33%) during pregnancy. All the women in both groups who experienced low back pain before or during pregnancy had complained of it in the postpartum period. These results agree with other studies, again confirming

that spinal-epidural analgesia does not contribute to permanent postpartum low back pain (Leighton and Halpern 2002, Russell and Groves 1993).

Russell (Russell and Groves 1993) reported an 18 % incidence of new onset low back pain in par-turients receiving epidural and 12 % in those who did not receive epidural analgesia. MacArthur (MacArthur et al. 1995) found rates of 19 % and 11 %. These retrospective studies concluded that the epidural anesthesia was causal to posture, muscle relaxation, and immobility during labor. In our study, 32 cases (26 %) in the combined spinal-epidural group developed low back pain. A previous study (Loughnan et al. 2002) found rates of 29 % in the epidural group and 28 % in the non-epidural group. Howell (Howell et al. 2001) found no difference between epidural and non-epidural groups at 3 and 12 months. MacArthur (MacArthur et al. 1995) found an increased risk of low back pain in women receiving epidurals only on the 1st day (epidural 53 %, 43 % non-epidural); the difference was no longer present at seven days and 6 months, similar with our own experience.

It has been suggested that joint immobility, causing loss of protective reflexes, poor posture and tense positions during birth, could contribute to low back pain (MacEvilly and Buggy 1996). MacArthur et al. (MacArthur et al. 1995) found in a study of low back pain occurring after vaginal delivery, emergency caesarean and elective caesarean delivery performed under epidural anesthesia, found that no low-back pain was occurred in elective caesarean group. They related this not to epidural needle trauma but to the fact that this group did not experience of labor pain, suggesting the problem may be related to posture.

We found no significant correlation between low back pain associated with CSE analgesia and factors such as the operator's experience, approach, invasive procedure level, the difficulty of interspinous space palpation, and dural punction presence. Mense (Mense 1993) has suggested that intramuscular hematomas may cause pain and Gronblad (Gronblad et al. 1984) suggested that periostal specific receptors could be activated by small hematomas formed as a result of the insertion of epidural needle. These explanations might account for pain occurring as a result of trauma during difficult procedures. Low back pain associated with epidural analgesia was not observed to be severe or permanent (Russell and Groves 1993, Leighton and Halpern 2002). In our study,

the incidence of complaints of low back pain on the first day was 62.5 % in the CSE group and 25 % in the non-epidural group; however, at the 6th month these rates were 25 % and 29 %.

In conclusion, we have shown that combined spinal-epidural block during labor does not increase the incidence of postpartum new onset low back pain after the first day. Difficulties during the procedure, elicitation of paresthesia, and multiple attempts may increase the risk of postpartum low back pain in the short-term but not the long-term. Thus, we believe that combined spinal-epidural analgesia does not increase the risk of developing new onset low back pain in labor.

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