

Factors Related to Patient Satisfaction on Postoperative Epidural Analgesia

Banchobporn Songthamwat MD*, Prok Laosuwan MD*, Waraporn Kanson MD*, Monson Ussawanopkiat MD*, Phatthanaphol Engsusophon MD*, Somrat Charuluxananan MD*

* Department of Anesthesiology, Faculty of Medicine, Chulalongkorn University and King Chulalongkorn Memorial Hospital, Thai Red Cross Society, Bangkok, Thailand

Background: Postoperative pain is the most common problem during perioperative period. An inadequate postoperative pain control causes numerous undesirable consequences. Patient satisfaction, an indicator reflecting quality of care in hospitals, depends on the management of pain.

Objective: To evaluate the factors affecting patient satisfaction after epidural analgesia in a tertiary care center.

Material and Method: Two hundred sixty-two patients who met the criterion in Acute Pain Service at King Chulalongkorn Memorial Hospital between October 2013 and September 2014 were enrolled in the present prospective cohort study. Demographic data, perioperative management related to analgesia, numerical pain score (NPS = 0 to 10), patient satisfaction score (0 to 10; 0 = worst, 10 = best), side effects, and problems resulting from epidural analgesia were recorded.

Results: Two hundred thirty-seven patients (90.5%) rated overall satisfaction score greater than 7. The median (range) overall satisfaction score of receiving epidural analgesia was 9 (3 to 10). The factors associated with increasing satisfaction score were duration of indwelling epidural catheter at three days or less, $p = 0.022$, $OR = 0.13$ (0.023 to 0.750), and low pain score, $p = 0.009$, $OR = 0.03$ (0.003 to 0.426). The factor related to dissatisfaction was motor weakness of lower extremities, $p = 0.012$, $OR = 15.05$ (1.815 to 124.723).

Conclusion: Majority of patients reported high level of satisfaction of pain management relating to epidural analgesia. Decreasing duration of indwelling epidural catheter and low pain score promoted satisfaction whereas motor weakness affected patient dissatisfaction.

Keywords: Epidural analgesia, Patient satisfaction, Postoperative pain management, Risk factor

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Postoperative pain is the most frequent problem during perioperative period⁽¹⁾. An inadequate postoperative pain control causes numerous undesirable consequences including postoperative cardiopulmonary complications and immunological imbalance^(2,3). This could lead to a delayed recovery and prolong hospital admission⁽⁴⁾. Some patients may experience chronic pain and subsequently have a poor quality of life⁽⁵⁾. Although there are several techniques of pain treatment, epidural anesthesia, and analgesia have shown more advantages compared to other methods in many studies^(6,7).

Patient satisfaction is one of important indicators reflecting quality of clinical care in hospitals and depends on the management of pain⁽⁸⁻¹⁰⁾. Nowadays, acute pain service (APS) has been established in several institutions aiming to provide a quality of medical care.

We organized APS, which is anesthesiologist-based, in our tertiary teaching hospital to enhance an effective care. Therefore, to improve the quality of APS at King Chulalongkorn Memorial Hospital, we conducted a cohort study to determine the factors influencing patient satisfaction with postoperative pain management after receiving epidural analgesia. The adverse events and problems related to epidural analgesia were also studied as the secondary outcome.

Material and Method

After the institutional Ethics Committee approval and written informed consent, patients underwent surgery with epidural catheter insertion performed for postoperative pain management at King Chulalongkorn Memorial Hospital, between October 1, 2013 and September 30, 2014, were included in the prospective cohort study. Patients younger than 18 years or unable to report pain score or satisfaction score were excluded.

Standard management of epidural anesthesia and postoperative analgesia, depending on list

Correspondence to:

Songthamwat B. Department of Anesthesiology, Faculty of Medicine, Chulalongkorn University and King Chulalongkorn Memorial Hospital, Thai Red Cross Society, Bangkok 10330, Thailand.
Phone: +66-2-2564295
E-mail: Sbanchobporn@gmail.com

anesthesiologists, was administered. Patients were visited daily by anesthesiologists who were responsible for APS at the day after surgery until the epidural catheter was removed. Patient demographic data, type of surgery, anesthetic profiles regarding epidural technique and analgesics used, average postoperative pain score (numerical pain score (NPS) = 0 to 10), adverse events, and problems resulting from epidural analgesia were collected. The patients were also asked to rate the overall satisfaction score (0 to 10; 0 = worst, 10 = best) of epidural analgesia for postoperative pain management when discharged from APS.

Statistical analysis

Descriptive statistics were derived for the study population and were expressed as a number (%) and mean (SD) or median (range), depending on

Table 1. Demographic data (n = 262)

Variable	n (%)
Age (year)	
18 to 60	141 (53.8)
>60	121 (46.2)
Gender	
Male	129 (49.2)
Female	133 (50.8)
ASA status	
I	96 (36.6)
II	144 (55.0)
III	22 (8.4)
Underlying disease	148 (56.5)
Current analgesics	7 (2.7)
Non-elective surgery	5 (1.9)
Type of surgery	
Thorax	17 (6.5)
Upper abdomen	125 (47.7)
Lower abdomen	87 (33.2)
Others (i.e., extremities)	33 (12.6)
Level of epidural catheter	
Thoracic level	100 (38.2)
Lumbar level	162 (61.8)
Epidural technique	
Intermittence	203 (77.5)
Infusion	8 (3.1)
PCEA	51 (19.4)
Epidural drug	
Morphine	205 (78.2)
Fentanyl	26 (9.9)
Local anesthetic drug	23 (8.8)
Local anesthetic drug with narcotics	8 (3.1)
Overall patient satisfaction score	9 (3 to 10)
Satisfaction score >7	237 (90.5)

ASA = American Society of Anesthesiologists; PCEA = patient-controlled epidural analgesia
Values are presented in frequency (%) or median (range)

variable distribution. The correlations of each variable with satisfaction score greater than 7 were assessed using Student t-tests or Chi-square tests. Binary logistic regression with odds ratio (OR) and 95% confidence interval (CI) were used as estimates of risk for categorical variables. Significant ($p < 0.05$) variables were then

Table 2. Univariate analysis of variables divided by patient satisfaction: patient and surgical factors

Variable	Satisfaction >7, n (%)	Satisfaction ≤7, n (%)	p-value
ASA status			0.221
I	83 (35.0)	13 (52.0)	
II	133 (56.1)	11 (44.0)	
III	21 (8.9)	1 (4.0)	
Underlying disease			0.063
No	99 (41.8)	15 (60.0)	
Yes	138 (58.2)	10 (40.0)	
Current analgesics			0.509
No	231 (97.5)	24 (96.0)	
Yes	6 (2.5)	1 (4.0)	
Surgery			0.390
Elective	233 (98.3)	24 (96.0)	
Non-elective	4 (1.7)	1 (4.0)	
Type of surgery			0.020*
Thorax	12 (5.1)	5 (20.0)	
Upper abdomen	115 (48.5)	10 (40.0)	
Lower abdomen	78 (32.9)	9 (36.0)	
Others	32 (13.5)	1 (4.0)	
Site of catheter			0.101
Thoracic level	87 (36.7)	13 (52.0)	
Lumbar level	150 (63.3)	12 (48.0)	
Epidural technique			0.872
Intermittent	183 (77.2)	20 (80.0)	
Infusion	7 (3.0)	1 (4.0)	
PCEA	47 (19.8)	4 (16.0)	
Epidural drug			0.975
Morphine	185 (78.1)	20 (80.0)	
Fentanyl	24 (10.1)	2 (8.0)	
Local anesthetic	21 (8.9)	2 (8.0)	
Local anesthetic with narcotics	7 (2.9)	1 (4.0)	
Pain score at the day after surgery			0.006*
Pain score 0	120 (50.6)	12 (48.0)	
Pain score 1-3	99 (41.8)	8 (32.0)	
Pain score 4-6	17 (7.2)	3 (12.0)	
Pain score 7-10	1 (0.4)	2 (8.0)	
Duration of indwelling catheter			0.024*
1 day	55 (23.2)	6 (24.0)	
2 days	127 (53.6)	12 (48.0)	
3 days	51 (21.5)	4 (16.0)	
>3 days	4 (1.7)	3 (12.0)	
Catheter related problems			0.001*
No	232 (97.9)	20 (80.0)	
Yes	5 (2.1)	5 (20.0)	
Change of treatment plan			0.037*
No	229 (96.6)	22 (88.0)	
Yes	8 (3.4)	3 (12.0)	

ASA = American Society of Anesthesiologists; PCEA = patient-controlled epidural analgesia
* Statistically significant, $p < 0.05$

entered into separate multivariate logistic regression models to calculate adjusted odds ratio (AOR). All analyses were performed by using SPSS v.21.0 for Windows. A two-sided *p*-value of less than 0.05 was considered statistical significance.

Results

Two hundred sixty-two patients were included in the analysis. Demographic data, epidural anesthetic profile, surgical characteristics, and overall patient satisfaction score are shown in Table 1.

According to satisfaction, 90.5% (237) of patients rated overall satisfaction score greater than 7 and the median overall score was 9 (3 to 10). Factors associated with patient satisfaction score greater than 7, including NPS at the day after surgery, are

shown in Table 2. Side effects and complications that corresponded to the epidural analgesia are expressed in Table 3. After adjustment for patients, anesthetic techniques, and surgical factors, there was a relationship between good patient satisfaction (satisfaction score greater than 7) and duration of indwelling catheter, *p* = 0.022, AOR = 0.13 (0.023 to 0.750), pain score, *p* = 0.009, AOR = 0.03 (0.003 to 0.426), and motor weakness of lower extremities, *p* = 0.012, AOR = 15.05 (1.815 to 124.723) (Table 4). Some problems regarding management of epidural analgesia occurred. For instance, the medications could not be injected through an epidural catheter or the epidural catheter became dislodged. The analgesic treatment plans were consequently changed to achieve a better pain control.

Table 3. Univariate analysis of variables divided by patient satisfaction: side effects

Variable	Satisfaction >7, n (%)	Satisfaction ≤7, n (%)	<i>p</i> -value	OR (95% CI)
Dizziness			0.099	5.47 (0.721 to 41.537)
No	193 (81.4)	24 (96.0)		
Yes	44 (18.6)	1 (4.0)		
Nausea			0.970	0.98 (0.414 to 2.304)
No	153 (64.6)	16 (64.0)		
Yes	84 (35.4)	9 (36.0)		
Vomiting			0.609	1.48 (0.485 to 4.49)
No	185 (78.1)	21 (84.0)		
Yes	52 (21.9)	4 (16.0)		
Pruritus			0.880	1.20 (0.523 to 2.751)
No	122 (51.5)	14 (56.0)		
Yes	115 (48.5)	11 (44.0)		
Drowsiness			0.851	1.14 (0.324 to 4.046)
No	205 (86.5)	22 (88.0)		
Yes	32 (13.5)	3 (12.0)		
Respiratory depression			0.141	0.20 (0.018 to 2.336)
No	235 (99.2)	24 (96.0)		
Yes	2 (0.8)	1 (4.0)		
Numbness			0.011*	0.04 (0.008 to 0.258)
No	235 (99.2)	21 (84.0)		
Yes	2 (0.8)	4 (16.0)		
Motor weakness			0.049*	0.10 (0.013 to 0.728)
No	235 (99.2)	23 (92.0)		
Yes	2 (0.8)	2 (8.0)		
Hypotension			0.818	-
No	235 (99.2)	25 (100)		
Yes	2 (0.8)	0 (0.0)		

Table 4. Factors associated with satisfaction score >7 (multivariable models)

Variable	<i>p</i> -value*	Adjusted odds ratio (95%CI)
Duration of indwelling catheter (>3 days/1day)	0.022	0.13 (0.023 to 0.75)
Pain score (severe pain/no pain)	0.009	0.03 (0.003 to 0.426)
Absence of motor weakness	0.012	15.05 (1.815 to 124.723)

* Multivariate analysis by forward stepwise logistic regression found that of the 7 variables used in our model, three were significant

Discussion

The present study presented the satisfaction score on epidural analgesic techniques for postoperative pain management. The concept of patient satisfaction is quite complex and multidimensional^(11,12); hence, understanding the problems correlated with satisfaction could encourage clinicians to improve the quality of healthcare. Most satisfaction studies of anesthesia reported high levels of satisfaction^(13,14). Epidural analgesia is effective with low rate of adverse effects⁽¹⁵⁾. Several studies have shown that patients receiving epidural analgesic techniques generally had lower VAS pain scores and a higher level of satisfaction^(16,17). However, some patients were very satisfied with pain management despite significant amount of pain^(18,19). This is most likely secondary to the inevitable pain expectation⁽¹⁹⁾. Therefore, pain cannot be used as the sole indicator of patient satisfaction.

According to the results, high level of overall satisfaction of epidural analgesia was rated (satisfaction score greater than 7, 90.5%), and it was found comparable to other studies^(20,21). Furthermore, apart from mild postoperative pain, the factors favored satisfaction in this study was the duration of indwelling epidural catheter. Leaving the left epidural catheter in situ may cause patients discomfort and produce numbness from local anesthetic agents. Therefore, they might prefer a shorter period of indwelling epidural catheter. Regarding the difference in current clinical practices for epidural analgesia, the technique of epidural pain management (patient-controlled epidural analgesia (PCEA), rescued by PCEA dose vs. infusion or bolus, rescued by nurse) in our study was not a significant factor. This was consistent with previous studies indicating that time to rescue drugs did not predict satisfaction^(22,23).

Nevertheless, factor determining dissatisfaction was motor weakness of lower extremities, which was similar to the previous study. Lubenow et al found that factors affecting dissatisfaction in postoperative epidural analgesia were wet tap and motor weakness⁽²⁴⁾. Weakness of the lower limbs could also be the hindrance for ambulation and could lead to a delayed recovery. Reducing the concentration of local anesthetics diminishes the degree of motor weakness and might improve patient satisfaction. As for the complications of epidural analgesia, even though we also found respiratory depression as a major complication, the number was small and did not associate with dissatisfaction. Among three patients facing respiratory depression, a patient whom safely

treated with medications still rated high satisfaction score.

However, there were limitations in the present study. This was a prospective cohort study. As a result, in our clinical settings, most patients who received epidural analgesia underwent major operations that intended to confront moderate to high pain intensity. When implied with other groups of patients, it should be speculated meticulously. The validated satisfaction test had not been used in the present study. Patients were interviewed with questionnaires that are routine practice in the author's center. Additionally, patient satisfaction theories compare differences between patient expectation and provision of medical care; likewise, it can be affected from many aspects e.g., psychological factors. That is, further researches are needed to evaluate and illustrate other components that could impact patient satisfaction.

In conclusion, most patients reported high level of satisfaction of pain management relating to epidural analgesia. Short duration of epidural catheter indwelling, and low pain score promoted satisfaction whereas motor weakness affected patient dissatisfaction.

What is already known on this topic?

Epidural analgesia provides effective postoperative pain control and good patient satisfaction.

What this study adds?

The present study confirmed that patients rated high satisfaction on epidural analgesia, although some patients experienced side effects. There are factors associated with satisfaction rather than pain issue.

Potential conflicts of interest

None.

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ปัจจัยที่มีผลต่อความพึงพอใจของผู้ป่วยในการระงับปวดหลังการผ่าตัดด้วยวิธีให้ยาระงับปวดผ่านสายที่คาไว้ในช่องเหนือไขสันหลัง

บรรจบพร ทรงธรรมวัฒน์, ประก เหล่าสุวรรณ, วราภรณ์ แก่นสน, มนต์สรร อัครวทเกียรติ, พัฒนพล เอ็งสุโสภณ, สมรัตน์ จารุลักษณะนันท์

ภูมิหลัง: ความปวดเฉียบพลันหลังการผ่าตัดเป็นอาการไม่พึงประสงค์ที่ก่อให้เกิดภาวะแทรกซ้อนและผลเสียในด้านต่างๆ การให้การดูแลและระงับปวดส่งผลต่อความพึงพอใจของผู้ป่วย ซึ่งสามารถบ่งบอกถึงคุณภาพในการดูแลผู้ป่วยที่มาเข้ารับการผ่าตัดในแต่ละโรงพยาบาลเช่นกัน

วัตถุประสงค์: ศึกษาถึงปัจจัยต่างๆ ที่มีผลต่อความพึงพอใจของผู้ป่วยต่อการระงับปวดหลังการผ่าตัดด้วยวิธีให้ยาระงับปวดผ่านสายที่คาไว้ในช่องเหนือไขสันหลัง

วัสดุและวิธีการ: ผู้ป่วยที่ได้รับการระงับความปวดหลังการผ่าตัดด้วยวิธีใส่สายทางช่องเหนือไขสันหลังจำนวน 262 ราย ที่อยู่ภายใต้การดูแลของหน่วยระงับปวดเฉียบพลัน จะถูกเก็บข้อมูลในการศึกษาแบบพรรณนาชนิดไปข้างหน้า โดยวิสัญญีแพทย์เป็นผู้สอบถามผู้ป่วยถึงคะแนนความพึงพอใจต่อการดูแลระงับปวดด้วยวิธีการใส่สายทางช่องเหนือไขสันหลังโดยใช้ patient satisfaction score; 0-10, 0 = ไม่พอใจมากที่สุด และ 10 = พอดีมากที่สุด และเก็บบันทึกข้อมูลที่เกี่ยวข้อง คะแนนความปวด (numerical pain score; NPS = 0 to 10) รวมทั้งผลข้างเคียงที่เกิดจากการระงับปวดด้วยวิธีนี้

ผลการศึกษา: ผู้ป่วยจำนวน 237 ราย (ร้อยละ 90.5) ได้ให้คะแนนความพึงพอใจ >7 โดยปัจจัยที่มีผลเพิ่มความพึงพอใจ คือระยะเวลาในการมีสายทางช่องเหนือไขสันหลัง 3 วันหรือน้อยกว่า, $p = 0.022$, AOR = 0.131 (0.023-0.750), คะแนนความปวดที่น้อย $p = 0.009$, AOR = 0.034 (0.003-0.426) และปัจจัยที่มีผลลดความพึงพอใจคืออาการชาอ่อนแรง, $p = 0.012$, AOR = 15.048 (1.815-124.723)

สรุป: ผู้ป่วยมีความพึงพอใจต่อการดูแลระงับปวดหลังการผ่าตัดด้วยวิธีให้ยาระงับปวดผ่านสายที่คาไว้ในช่องเหนือไขสันหลังอยู่ในเกณฑ์สูง ระยะเวลาที่สั้นของการคาสายไว้และคะแนนความปวดที่น้อยจะช่วยเพิ่มความพึงพอใจ ส่วนอาการชาอ่อนแรงจะลดความพึงพอใจต่อการได้รับการระงับปวดด้วยการใส่สายทางช่องเหนือไขสันหลัง
