

# Factors Related to Patient Satisfaction Regarding Spinal Anesthesia

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## Abstract

**Purpose :** Regional anesthesia has been shown to improve the clinically oriented outcome and many studies investigating the use of regional anesthesia have incorporated patient satisfaction measurements. This study was undertaken to find the factors related to patient satisfaction after spinal anesthesia which is the most frequent regional anesthesia conducted.

**Method :** A prospective descriptive study of spinal anesthesia and post-operative survey of patients on the day after surgery was conducted by collecting pre-operative and intra-operative data on a constructed questionnaire. Post-operative data including average pain score, satisfaction score of receiving spinal anesthesia, adverse effects and willingness to accept or refuse spinal anesthesia for a similar surgery again were asked by the performer of spinal anesthesia or trained anesthesia personnel.

**Results :** The average satisfaction score of receiving spinal anesthesia of 522 patients was  $8.30 \pm 1.80$  which was divided into 502 (96.2%) of satisfied patients (satisfaction score  $\geq 5$ ) and 20 (3.8%) of dissatisfied patients (satisfaction score  $< 5$ ). Factors associated with dissatisfaction were the increasing number of attempts of spinal block,  $p = 0.028$ , OR = 0.67 (0.48-0.96) ; pain during spinal block,  $p = 0.035$ , OR = 0.77 (0.60-0.98), inadequate analgesia,  $p = 0.005$ , OR = 0.07 (0.01-0.45) and post-operative urinary retention,  $p < 0.001$ , OR = 0.07 (0.02-0.28). Factors associated with refusal to have spinal anesthesia for similar surgery again were : female gender,  $p = 0.008$ , OR = 6.00 (1.61-22.37), low body weight,  $p = 0.009$ , OR = 0.95 (0.92-0.98), intra-operative vomiting,  $p = 0.01$ , OR = 5.02 (1.47-17.08) and low satisfaction score of spinal anesthesia,  $p < 0.001$ , OR = 0.04 (0.01-0.12).

**Conclusion :** The patients receiving spinal anesthesia gave a high rate of patient satisfaction score of receiving spinal anesthesia. Ensuring quality of spinal anesthesia, improving clinical skill of anesthesiologists and prevention of side effects especially urinary retention would improve patient satisfaction.

**Key word :** Spinal Anesthesia, Satisfaction, Quality

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Quality of health care has been defined as the degree to which health services increase the likelihood of desired health outcome consistent with current professional knowledge<sup>(1,2)</sup>. Quality of life is relevant in this context and can be measured after anesthesia and surgery by<sup>(1)</sup> objective dimensions (desired treatment outcome, functional status) and/or<sup>(2)</sup> subjective dimensions (assessments of well being or affective component and patient satisfaction), is an important measure of quality of care that can contribute to a balanced evaluation of the structure, process and outcome of services<sup>(2-5)</sup>. Measurement of patient satisfaction has become increasingly important in the anesthesia service. It ensures the quality of anesthesia care<sup>(6,7)</sup>, improves and intensifies the anesthesiologist to patient relationship<sup>(8)</sup> and can also be seen as a marketing tool in terms of customer orientation<sup>(9)</sup>.

Regional anesthesia and analgesia have been shown to improve the clinically oriented outcome<sup>(10)</sup>, and many studies investigating the use of regional anesthesia have incorporated patient satisfaction measurements. At King Chulalongkorn Memorial Hospital, spinal anesthesia is performed for nearly half of the patients undergoing surgery, however, data on patients receiving spinal anesthesia are not well established, despite the potential benefits of regional anesthesia. The authors established a prospective study of spinal anesthesia and post-operative survey of patients on the day after surgery as quality assurance (QA) activity to determine factors related to patient satisfaction.

## METHOD

After protocol approval from the institutional ethics committee and written informed consent was obtained, the authors collected data prospectively on 522 adult patients undergoing surgery under spinal anesthesia at King Chulalongkorn Memorial Hospital, a 1,500 bed tertiary hospital as part of an ongoing quality improvement programme (hospital accreditation) by the Department of Anesthesiology, Faculty of Medicine, Chulalongkorn University. The performer of spinal anesthesia entered the pre-operative and intra-operative data on a constructed data collecting questionnaire. Data collection also included patient characteristics, type of surgery, comprehensive anesthetic details, verbal numeric pain score during spinal injection (0 = no pain, 10 = most imaginable pain), intra-operative adverse events and adverse events in

postanesthesia care unit such as hypotension, nausea, vomiting, shivering visceral pain and inadequate analgesia, urinary retention, pruritus, drowsiness, respiratory depression

On the day after surgery the performer of spinal anesthesia or trained anesthesia personnel visited the patients and collected the post-operative data including average post-operative pain score by verbal numeric pain score 0-10, drowsiness, respiratory depression, postdural puncture headache. The patients were asked to rate the satisfaction score of spinal anesthesia 0-10 (0 = most dissatisfied, 10 = most satisfied) and to choose whether the patient would accept or refuse to receive spinal anesthesia for a similar surgery again.

## Statistical analysis

Descriptive statistics were derived for the study population and are expressed as number (%) or mean (SD). Associations of categorical variables with patient dissatisfaction (satisfaction score < 5) were assessed using chi-square tests, and the significance of continuous variables was assessed with *t*-tests. Univariate odds ratio (OR) and 95 per cent confidence interval (CI) were used as estimates of risk for categorical variables. Significant ( $p < 0.05$ ) variables were then entered into separate multivariate logistic regression models to calculate the adjusted OR. All analyses were performed using SPSS version 10.0 for Windows. A two-sided *p*-value of  $< 0.05$  was used for statistical significance.

## RESULTS

Peri-operative data for 522 patients were entered into the database. The characteristics and type of surgery of the study population are presented in Table 1. The average (mean  $\pm$  SD) satisfaction score of receiving spinal anesthesia of 522 patients was  $8.30 \pm 1.80$  which could be divided to binary groups: 502 (96.2%) satisfied patients (satisfaction score  $\geq 5$ ) and 20 (3.8%) dissatisfied patients (satisfaction score < 5). Table 2 and Table 3 show the univariate analysis of the variables between the satisfied group and dissatisfied group. There was no patient with respiratory depression, severe drowsiness and postspinal headache in the study. Table 4 shows factors associated with satisfaction score of spinal anesthesia service < 5 by multivariable model.

There were 495 patients (94.8%) who answered whether they would accept or refuse receive spinal anesthesia for a similar surgery again. Thirty-

**Table 1. Patients' and surgical characteristics.**

Variables	%	
Age (year)	40.4 ± 15.1	
Weight (kg)	63.8 ± 11.0	
Male	158	30.3
Female	364	69.7
Obstetric	262	50.2
Gynecology	53	10.2
Urology	74	14.2
General surgery	97	18.6
Orthopedics	25	4.8
Plastic surgery	11	2.1

Values presented in mean ± SD and frequency

three patients (6.66%) refused to receive spinal anesthesia for a similar surgery. After adjustment for patient, anesthesia condition, intra-operative and post-operative events there was relationship between refusal of spinal anesthesia for similar surgery and sex, body weight, intra-operative vomiting and satisfaction score of receiving spinal anesthesia as shown in Table 5. The reasons for refusal of spinal anesthesia for a similar surgery were: disliked being conscious during the operation for 14 patients (42.4%), disliked to perceiving any pain for 6 patients (18.1%), inadequate analgesia during operation for 3 patients (9.12%), respiration discomfort for 3 patients (9.1%) and afraid of long-term backache for 2 patients (6.1%). Other reasons were intra-operative shivering, transient neuro-

logical deficit and disliked being operated on 1 patient (3.0%) for each reason.

## DISCUSSION

The authors found a high degree (mean score 8.30) and high rate of patient satisfaction score of receiving spinal anesthesia  $\geq 5$  (96.1%) in patients interviewed on the first day after surgery which was consistent with former studies<sup>(9,11,12)</sup>. The rate of dissatisfaction was low (3.8%). However, it is recognized that patient responses may be modified to please staff and to avoid repercussions for negative care appraisal<sup>(2,13,14)</sup>, and hence this may be an under-representation of the true level of dissatisfaction. Other hospital satisfaction surveys have reported a dissatisfaction rate of less than 15 per cent<sup>(9,15,16)</sup>. It has been suggested previously that patients do not know what to expect during their hospitalization to allow them to rate their satisfaction appropriately<sup>(14)</sup>. However, by identifying the areas for improvement for a small number of patients, the authors could be advancing the quality of care for an anonymous majority of patients.

The authors found that an increasing number of attempts of spinal block and intensity of pain score while conducting the spinal anesthesia were predictors of dissatisfaction, therefore, patients with difficulty in spinal block may need special care such as supervisor or guideline to decrease the number of attempts. Intra-operative inadequate analgesia was

**Table 2. Univariate analysis of discrete variables between satisfied and dissatisfied patients.**

Variables	Incidence	%	Dissatisfaction rate	%	Univariate OR (95% CI)	P
Female sex	364	69.7	14	3.8	1.01 (0.38-2.68)	1
Performer student	139	26.6	8	5.8	1.88 (0.75-4.72)	0.262
$\geq 3$ attempts of spinal block	77	14.8	7	9.1	0.30 (0.11-0.78)	0.018
Local anesthetics lidocaine	260	49.8	12	4.6	1.53 (0.61-3.82)	0.483
Intrathecal morphine	238	45.6	8	3.4	1.26 (0.51-3.15)	0.777
Urinary catheterization	234	44.9	8	3.4	1.23 (0.49-3.06)	0.825
Intra-operative hypotension	119	22.8	5	4.2	0.88 (0.31-2.47)	0.788
Intra-operative nausea	55	10.5	2	3.6	1.06 (0.24-4.70)	1
Intra-operative vomiting	21	4.0	0	0.0	-	1
Intra-operative shivering	44	8.4	1	2.3	1.78 (0.23-13.6)	1
Intra-operative visceral pain	19	3.6	1	5.3	0.70 (0.09-5.57)	0.530
Intra-operative inadequate analgesia	7	1.3	2	28.6	0.09 (0.01-0.49)	0.026
Post-operative hypotension	1	0.2	0	0.0	-	1
Post-operative urinary retention	20	3.8	4	20.0	0.13 (0.04-0.43)	0.005
Post-operative nausea	81	15.5	1	1.2	3.60 (0.47-27.28)	0.340
Post-operative vomiting	56	10.7	1	1.8	2.33 (0.30-17.80)	0.711
Post-operative pruritus	91	17.4	1	1.1	4.15 (0.54-31.40)	0.225

**Table 3. Univariate analysis of continuous variables between satisfied and dissatisfied patients.**

Variables	Satisfied Patients		Dissatisfied Patients		P
	No.	Mean $\pm$ SD	No.	Mean $\pm$ SD	
Age (years)	501	40.2 $\pm$ 15.0	20	43.6 $\pm$ 16.6	0.336
Body (kg)	481	63.8 $\pm$ 11.0	19	61.7 $\pm$ 9.2	0.407
Attempts of spinal block	502	1.5 $\pm$ 0.9	20	2.1 $\pm$ 1.2	0.004
Pain during spinal block	498	2.3 $\pm$ 1.77	20	3.3 $\pm$ 2.3	0.013
Post-operative pain	502	3.4 $\pm$ 2.3	20	2.9 $\pm$ 2.1	0.300

**Table 4. Factors associated with satisfaction score of spinal anesthesia  $\geq 5$  (multivariable models).**

Variables	Parameter estimate	Standard error	P	Adjusted odds ratio (95% CI)
Attempts at spinal block	-0.38	0.17	0.028	0.67 (0.48-0.96)
Pain during spinal block	-0.26	0.12	0.035	0.77 (0.60-0.98)
Inadequate analgesia	-2.58	0.91	0.005	0.07 (0.01-0.45)
Post-operative urinary retention	-2.54	0.66	< 0.001	0.07 (0.02-0.28)

**Table 5. Factors associated with refusal to have spinal block for the same surgery again (multivariable models).**

Variables	Parameter estimate	Standard error	P	Adjusted odds ratio (95% CI)
Female sex	1.79	0.67	0.008	6.00 (1.61-22.37)
Body Weight	-0.04	0.01	0.009	0.95 (0.92-0.98)
Intra-operative vomiting	1.61	0.62	0.010	5.02 (1.47-17.08)
Satisfaction score for spinal anesthesia	-3.21	0.56	< 0.001	0.04 (0.01-0.12)

another factor strongly associated with dissatisfaction. This is not surprising given that patients are oblivious to most intra-operative events that do not result in adverse post-operative outcome. Traditionally, the perceived role of the anesthesiologist has been restricted to the immediate pre-operative and intra-operative periods<sup>(17)</sup>, whereas, anesthesiologists are now considered to have a greater involvement in pre-operative preparation and post-operative care<sup>(18, 19)</sup>. This should allow earlier detection and treatment of post-operative complications. Post-operative adverse event were not associated with patient dissatisfaction except post-operative urinary retention. In the present study use of intrathecal morphine was not associated with dissatisfaction. which can be explained by 2 reasons : 1) Intrathecal morphine provides long lasting post-operative analgesia which can cause more satisfaction. 2) The number of patients in

the present study is too small to detect the association of urinary retention caused by intrathecal morphine. However, to the authors' knowledge this is the largest satisfaction survey of patients receiving spinal anesthesia.

Factors associated with refusal to receive spinal anesthesia for the same surgery again were low satisfaction score of spinal anesthesia care, female gender, low body weight and intra-operative vomiting. The decreasing body weight corresponds to the female gender who were less acceptable to receive spinal anesthesia again. Intra-operative vomiting may cause suffering and patient discomfort which is accordant with previous studies<sup>(20,21)</sup>.

In a clinical setting such as anesthesia, using patient satisfaction as an indicator to monitor the quality of clinical care has potential merit. The conceptual problems with patient satisfaction might be

insurmountable, because perceptions of quality of care are subjective. Methodologically, the authors used closed-ended questions that allowed standardization of responses for statistical analysis and included qualitative open-ended questions about reasons for dissatisfaction. The limitations of the present study were the small sample of dissatisfied patients and descriptive design of the study.

In summary, the authors found a high rate high degree of patient satisfaction with spinal anesthesia. Factors associated with dissatisfaction were the increasing number of attempts of spinal block, intensity of pain during spinal block, intra-operative

inadequate analgesia and post-operative urinary retention. Ensuring quality of spinal anesthesia, improvement of clinical skill of anesthesiologists, and prevention of side effects should be considered. Given the low incidence of dissatisfaction, focused research on interventions that would improve patient satisfaction would be an enormous challenge.

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important to avoid? The perspective of a panel of expert anesthesiologists. *Anesth Analg* 1999; 88: 1085-91.

## ปัจจัยเกี่ยวข้องกับความพึงพอใจของผู้ป่วยที่ได้รับการให้ยาระงับความรู้สึกโดยการฉีดยาชาเข้าช่องน้ำไขสันหลัง

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**วัตถุประสงค์ :** การให้ยาระงับความรู้สึกเฉพาะส่วนส่งผลดีต่อผลลัพธ์ของผู้ป่วยที่ได้รับการให้ยาระงับความรู้สึก ปัจจุบันการศึกษาเกี่ยวกับการให้ยาระงับความรู้สึกมักมีการวัดผลความพึงพอใจร่วมด้วย การศึกษานี้มีวัตถุประสงค์เพื่อหาปัจจัยเกี่ยวข้องกับความพึงพอใจในการได้รับยาชาเข้าช่องน้ำไขสันหลัง ซึ่งเป็นวิธีการให้ยาระงับความรู้สึกที่นิยมทำกันมากที่สุด

**วิธีการศึกษา :** เป็นการศึกษาแบบพรรณานิตไปข้างหน้า โดยวิสัญญีแพทย์ผู้ฉีดยาชาเข้าช่องน้ำไขสันหลัง บันทึกข้อมูลทั้งในระยะก่อนให้ยาระงับความรู้สึก รายละเอียดเกี่ยวกับการให้ยาระงับความรู้สึก ลงในแบบสอบถามที่สร้างขึ้น ผู้ให้ยาระงับความรู้สึกหรือบุคลากรวิสัญญีที่ผ่านการฝึกในการสอบถามข้อมูลจะสอบถามและบันทึกความเจ็บปวดเฉลี่ยหลังการผ่าตัด, คะแนนความพึงพอใจในการให้ยาระงับความรู้สึก, ภาวะแทรกซ้อนที่เกิดขึ้น และการที่ผู้ป่วยจะยอมรับหรือปฏิเสธการฉีดยาชาเข้าช่องน้ำไขสันหลังอีก ถ้าต้องได้รับการผ่าตัดชนิดเดียวกับในวันหลังการผ่าตัด

**ผลการศึกษา :** คะแนนเฉลี่ยความพึงพอใจในการได้รับการฉีดยาชาเข้าช่องน้ำไขสันหลังเท่ากับ  $8.30 \pm 1.80$  ซึ่งแบ่งผู้ป่วยได้เป็น กลุ่มที่พึงพอใจ (คะแนนความพึงพอใจ  $\geq 5$ ) 502 คน (96.2%) และกลุ่มที่ไม่พึงพอใจ (คะแนนความพึงพอใจ  $< 5$ ) 20 คน (3.8%) ปัจจัยที่เกี่ยวข้องกับความไม่พึงพอใจ ได้แก่ การถูกฉีดยาชาเข้าช่องน้ำไขสันหลังหลายครั้ง  $p = 0.028$ , OR = 0.67 (0.48–0.96) ความเจ็บปวดระหว่างการฉีดยาชา  $p = 0.035$ , OR = 0.77 (0.60–0.98) ระดับการขาระหว่างผ่าตัดไม่เพียงพอ  $p = 0.005$ , OR = 0.07 (0.01–0.45) และหลังผ่าตัดต้องใส่สายสวนปัสสาวะ  $p < 0.001$ , OR = 0.07 (0.02–0.28) ปัจจัยที่เกี่ยวข้องกับการที่ผู้ป่วยปฏิเสธการได้รับการฉีดยาชาเข้าช่องน้ำไขสันหลังอีก ถ้าต้องรับการผ่าตัดแบบเดียวกัน ได้แก่ เพศหญิง  $p = 0.008$ , OR = 6.00 (1.61–22.37) น้ำหนักตัวน้อย  $p = 0.009$ , OR = 0.95 (0.92–0.98) การอาเจียนระหว่างผ่าตัด  $p = 0.01$ , OR = 5.02 (1.47–17.08) และความพึงพอใจในการได้รับการฉีดยาชาเข้าช่องน้ำไขสันหลังต่ำ  $p < 0.001$ , OR = 0.04 (0.01–0.12)

**สรุป :** ผู้ป่วยมีความพึงพอใจในการได้รับยาระงับความรู้สึกโดยการฉีดยาชาเข้าช่องน้ำไขสันหลังอยู่ในเกณฑ์สูง การควบคุมคุณภาพของการฉีดยาชาเข้าช่องน้ำไขสันหลัง การพัฒนาทักษะของวิสัญญีแพทย์ในการฉีดยาชาเข้าช่องน้ำไขสันหลัง ตลอดจนการป้องกันภาวะแทรกซ้อนหรือผลข้างเคียงโดยเฉพาะอย่างยิ่งภาวะปัสสาวะไม่ออกจะช่วยเพิ่มความพึงพอใจในการให้ยาระงับความรู้สึกโดยการฉีดยาชาเข้าช่องน้ำไขสันหลังได้มากขึ้น

**คำสำคัญ :** การฉีดยาชาเข้าช่องน้ำไขสันหลัง, ความพึงพอใจ, คุณภาพ

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