Patient Expectations and Experiences of Level of Consciousness During Regional Anesthesia: an Observational Study at Hua Hin Hospital

ความคาดหวังและประสบการณ์ของผู้ป่วย เกี่ยวกับระดับความรู้สึกตัว ระหว่างผ่าตัด ด้วยวิธีระงับความรู้สึกเฉพาะส่วน

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ABSTRACT

Background: There is a concern respecting intraoperative level of consciousness during regional anesthesia. Patients often expect complete unconsciousness due to misinterpreting what regional anesthesia accomplishes. Consequently, this unfulfilled experience could affect the patient's overall satisfaction. This study aimed to assess patients' expectation regarding level of consciousness during regional anesthesia compared with their actual experience and associated factors. Satisfaction toward provided anesthetic care was evaluated likewise.

Method: A prospective observational study was conducted with 130 patients from April - June 2017. A structured questionnaire was administered to patients who received neuraxial block for an elective surgical procedure, after discharge from recovery room. Statistical data were analyzed by SPSS version 18.

Results: Semi-consciousness was the most frequent anticipated experience by patients. Eighty-six patients (66%) had their expectation set by the anesthesiologist/ anesthesia provider. According to univariate analysis, preoperative anxiety and perioperative comfort were associated with having at least 4-point difference between expected and experienced level of consciousness (p=0.03 and 0.029 respectively). In addition, source of expectation also correlated with overall anesthetic experiences significantly (p=0.005).

Conclusions: Despite the fact that semi-consciousness could be anticipated during regional anesthesia, anesthesiologists and anesthesia providers, as a primary source of expectation regarding level of consciousness, should communicate expectations thoroughly, providing complete knowledge to the patient accordingly.

Keywords : Regional anesthesia, level of consciousness, satisfaction

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บทคัดย่อ

การที่ผู้ป่วยยังคงรู้สึกตัวระหว่างการระงับความรู้สึกเฉพาะส่วน (regional anesthesia) หรือ ผู้ป่วยมีระดับความรู้สึกตัว (level of consciousness) ไม่ตรงกับที่คาดหวังไว้ อาจส่งผลต่อสภาวะจิตใจหรือความพึงพอใจโดยรวมได้ การศึกษาครั้งนี้จัดทำขึ้นเพื่อศึกษาความคาดหวังด้านระดับความรู้สึกตัวของผู้ป่วย และประสบการณ์ที่ได้รับระหว่างผ่าตัด รวมถึงศึกษาปัจจัยที่เกี่ยวข้อง และความพึงพอใจโดยรวมของผู้ป่วยกลุ่มนี้ต่อการให้บริการทางวิสัญญี

วิธีการศึกษา: การศึกษานี้เป็นการศึกษาเชิงสังเกตแบบไปข้างหน้า ในผู้ป่วย 130 ราย ที่มาผ่าตัดแบบไม่เร่งด่วน โดยใช้วิธีระงับความรู้สึกเฉพาะส่วน (regional anesthesia) ที่โรงพยาบาลหัวหิน ตั้งแต่เดือนเมษายน ถึง มิถุนายน พ.ศ. 2560 โดยให้ผู้ป่วยตอบแบบสอบถามเกี่ยวกับระดับความรู้สึกตัว และประสบการณ์ด้านต่างๆ ในระหว่างผ่าตัด ข้อมูลทางสถิติถูกวิเคราะห์โดยโปรแกรม SPSS version 18

ผลการศึกษา: ในระหว่างการผ่าตัด ผู้ป่วยส่วนใหญ่ยังคงต้องการรู้สึกตัวบ้าง โดยร้อยละ 66 ของผู้ป่วยนั้น ความคาดหวังต่อระดับความรู้สึกตัวกำหนดโดยวิสัญญีแพทย์หรือทีมวิสัญญี จากการวิเคราะห์ตัวแปรเดียว พบว่าความวิตกกังวลก่อนผ่าตัดและความไม่สุขสบายระหว่างผ่าตัด สัมพันธ์กับภาวะที่ผู้ป่วยมีระดับความรู้สึกตัวต่างกับที่คาดหวังเกิน 4 คะแนน (p=0.03 and 0.029 ตามลำดับ) และประเภทของผู้ให้ความรู้แก่คนไข้สัมพันธ์กับประสบการณ์ด้านวิสัญญีอย่างมีนัยสำคัญ (p=0.005)

สรุป: ผลของการศึกษานี้ได้ย้ำให้เห็นถึงความสำคัญของการสื่อสารระหว่างทีมวิสัญญีและผู้ป่วย และการให้ความรู้ที่ถูกต้องแก่ผู้ป่วยเกี่ยวกับการระงับความรู้สึกเฉพาะส่วน รวมถึงระดับความรู้สึกตัวระหว่างผ่าตัด เพื่อพัฒนาและปรับปรุงการดูแลทางวิสัญญีให้มีคุณภาพมากยิ่งขึ้น

คำสำคัญ : การระงับความรู้สึกเฉพาะส่วน ระดับความรู้สึกตัว ความพึงพอใจ
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Introduction

In recent decades, increasing popularity of regional anesthesia (RA) has been witnessed by anesthesiologists. Continuous developments in its technical aspects have provided better quality and safety of anesthetic care to patients in all age groups. Further evidences show significant advantages over general anesthesia (GA) including superior postoperative analgesia and faster functional recovery.[1] Excessive depth of anesthesia and perioperative hypotension under GA are associated with higher mortality.[2] Using of neuraxial techniques in specific procedures potentially decreases major morbidity and mortality.[3, 4] Presently, RA is recommended for many surgical procedures unless contraindicated.[5, 6] At Hua Hin Hospital, from August 2016 – June 2017, RA was performed in 1,522 patients from total 5,231 patients (29%), indicating the percentage has increased from the past years.[7]

Although beneficial role of RA is emphasized extensively, remaining awake during surgery is one distinct limitation. In the operating room, a patient might feel anxious, nervous and fearful which could have a psychological impact that consequently affects overall

satisfaction.[8, 9] Sedation might not be adequate for some patients, since they often anticipated complete unconsciousness. Furthermore, the use of sedation incautiously can also be hazardous especially in the elderly.[10]

The previous studies have demonstrated that dividing line between GA and RA is possibly vague from the patients' perspective, as evidenced by complaints of intraoperative awareness from individuals who underwent RA/ monitored anesthesia care (MAC). The incidence of complaints concerning unexpected explicit recall is similar in patients receiving GA and RA.[11] This represents a failure of communicating appropriate expectations, regarding level of consciousness during RA and of patient understanding in relation to RA.

The objectives of this present study were to assess patients' expectations relating to levels of consciousness during RA compared with their actual experiences and associated factors. In addition, overall satisfaction toward provided RA was also assessed with a goal to improve quality of anesthetic care in terms of anesthesia providers and communication with patients.

Methods

After approval by the Hua Hin Hospital ethics committee, a prospective study was initiated that included 130 patients undergoing surgery with regional anesthesia from April - June 2017 at Hua Hin Hospital. This was designed to be a prospective observational study. Perioperative anesthetic management and patient sedation depended on the attending teams. Personal data of respondents were coded and maintained confidentially.

The study inclusion criteria were: Patients who underwent surgical procedure receiving regional anesthesia, older than 20 years of age, American Society of Anesthesiologists (ASA) physical status I to IV, fully conscious and able to communicate after the operation. Participants were excluded from the study, if any of following criteria was present: Emergency surgery, cesarean section, and anesthetic technique conversion to general anesthesia. Patients who declined to participate in the interview were withdrawn from the enrollment.

A questionnaire (table 1) was developed based on the previous literature.[12] It was originally written in English and translated into Thai. These interview questions were reviewed and approved by a panel of experts. Assessing patients' expectation in the preoperative period may potentially bias a respondent, so a structured questionnaire was administered postoperatively after patients completed discharge criteria from the recovery room.

In addition to patients' demographic data, including educational level and monthly income, their expected level of consciousness was identified based on a 1–10 scale, with 1 being complete unconsciousness and 10 being complete wakefulness. The highest/lowest levels of consciousness they experienced during the operation and the source of their expecta-

tion was also assessed. The respondents were also asked about preoperative anxiety and intraoperative comfort on a 1–10 scale, as well as overall satisfaction. The interview was validated for patient comprehension before the study.

Table 1 Structured interview to assess level of consciousness after regional anesthesia.

1. Thinking back to before the procedure, what level of consciousness did you expect?
2. During the actual procedure, what was your highest and lowest level of consciousness?
3. How did your actual experience compare with your expectations?
    1) My experience was as expected
    2) My experience was better than expected
    3) My experience was worse than expected
4. Who set your expectation for the level of consciousness during your procedure?
    1) Anesthesiologist or anesthesia provider
    2) Surgeon or member of surgical team
    3) Nurse
    4) Other (please specify)
    5) Do not know/do not remember
5. How much anxiety did you have before the procedure?
6. How much uncomfortable experience did you have during the procedure?
7. How much overall satisfaction did you have for provided regional anesthesia?

Statistical analysis

The sample size was calculated by the formula: $n = Z^2_{1-a} P(1-P) / d^2$, based on the study of Dave S.[13] that reported 35% of the patients had actual experienced level of consciousness during RA as expected. The sample size of 115 is adequate for the analysis with 95% confidence interval (95%CI) and a relative error (d/P) of 25% and the author increased the sample size to 130 patients to reduce margin of error.

Statistical analysis was performed using SPSS for Windows (versions 18.0, SPSS Inc.). Patient characteristics and other numerical data were reported by descriptive statistics, such as: mean, standard deviation, and minimum/maximum. To compare these independent results, numerical data was analyzed by Mann-Whitney U test and One-way ANOVA. Catagorial data was analyzed by Monte Carlo exact test. The univariate and multivariate logistic regression analysis was performed to identify risk factors

associated with having at least a 4-point difference between the experienced and expected levels of consciousness. P-value < 0.05 is considered statistically significant.

Results

130 patients were selected as participants, who met the enrollment criteria, with 58.4% being male and a mean age of 55 ± 17 years. All demographic data and patient characteristics were presented in table 2. As shown in figure 1 (below), anesthesiologist/ anesthesia provider was the most common response as a source of expectation (66%). And the majority of the patients (93.8%) reported that their overall anesthetic experience was as good as or better than they expected.

Table 2 Demographics and patient characteristics (N=130)

Demographics	Number of Patients (%)
Gender	
Male	76 (58.46%)
Female	54 (41.54%)
Age (year), mean±S.D. (range)	55±17 (20-86)
ASA physical status	
I	47 (36.15%)
II	71 (54.62%)
III	12 (9.23%)
Educational level	
None/ elementary school	52 (40%)
High school	34 (26.15%)
High vocational certificate	21 (16.15%)
Bachelor's degree	22 (16.92%)
Advanced degree	1 (0.77%)
Monthly income	
Less than 10,000 THB	63 (48.46%)
10,001-20, 000 THB	45 (34.62%)
20,001-50, 000 THB	22 (16.92%)
More than 50,000 THB	0 (0%)

Table 2 Demographics and patient characteristics (N=130) (con.)

Demographics	Number of Patients (%)
Type of Procedure	
General surgery	34 (26.15%)
Orthopedic	71 (54.62%)
Urological	22 (16.92%)
Gynecological	3 (3.21%)
Duration (min), mean±S.D. (range)	113±44 (30-245)

Data expressed as n (%) unless otherwise specified.

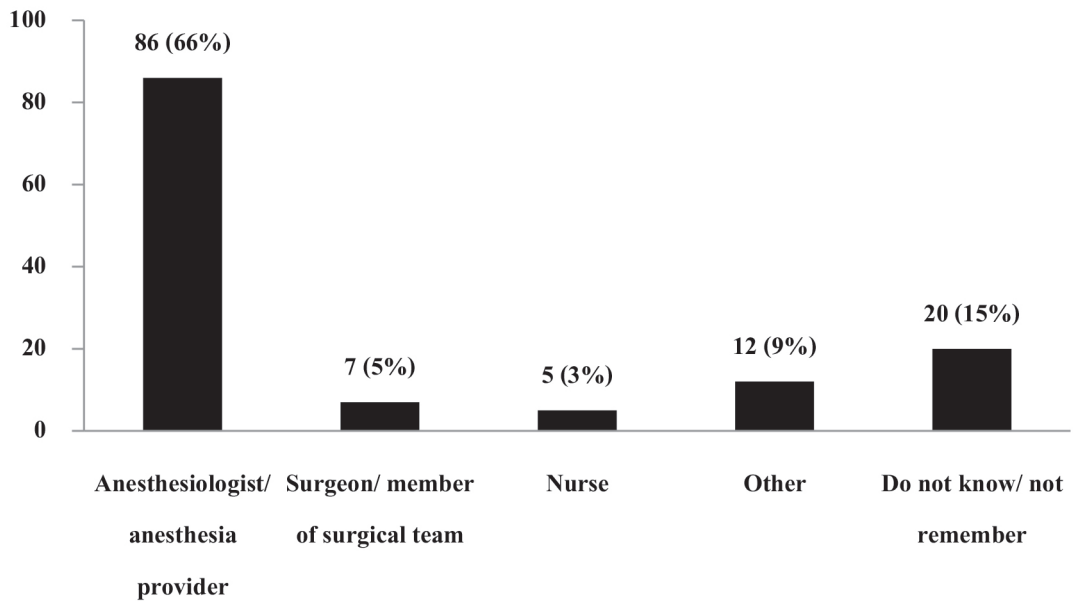

Fig. 1 Source of expectations regarding level of consciousness.

Table 3 lists the expected level of consciousness, along with the highest and lowest levels of consciousness subjectively experienced. The participants reported score 5 as a modal response for the expected level of consciousness (35 patients, 27%) and also the lowest level of consciousness experienced (37 patients, 28%). While completely awake (score 10) was a modal response for highest level of consciousness experienced (103 patients, 79%). Moreover, 32 patients (24%) were sometime more awake than expected by at least 4 points.

Table 3 Expected and experienced levels of consciousness in patients undergoing RA.

Level of Consciousness (LOC)	Expected LOC	Highest Level Experienced	Lowest Level Experienced
1 - 3	46 (35.38%)	0 (0%)	35 (26.92%)
4 - 7	57 (43.85%)	11 (8.46%)	61 (46.92%)
8 - 10	27 (20.77%)	119 (91.54%)	34 (26.15%)

According to univariate analyses (table 4), preoperative anxiety and perioperative comfort were associated with having at least 4-point difference from expected level of consciousness (p =0.03 and 0.029 respectively). Correspondingly, patients' satisfactions between these 2 groups were also statistically different. But multivariate logistic regression analysis (table 5) indicated that none of the risk factors had an independent effect (all adjusted p>0.05), neither preoperative anxiety and perioperative comfort. Additionally, Monte Carlo exact test demonstrated that source of expectation had a correlation with overall anesthetic experience, that was statistically significant (p=0.005). Satisfaction scores were also significantly different in patients who reported worse anesthetic experience, than expected when compared with the rest (p<0.001) as presented in table 6.

Table 4 All characteristics crosstab

Factors	≥4 points of expected LOC (32)	Within 4 points of expected LOC (98)	Relative risk (95%CI)	P-value
Female patients	15 (46.88%)	39 (39.8%)	1.335 (0.598-2.981)	0.481
Age	52.03±17.72	55.4±17.16	0.989 (0.966-1.012)	0.339
ASA≥3	1 (3.13%)	11 (11.22%)	0.255 (0.032-2.058)	0.200
Educational level				
None/ elementary school	15 (46.88%)	37 (37.76%)	1	
High school	10 (31.25%)	24 (24.49%)	1.028 (0.397-2.66)	0.955
High vocational certificate	3 (9.38%)	18 (18.37%)	0.411 (0.105-1.604)	0.201
Bachelor's degree	3 (9.38%)	19 (19.39%)	0.389 (0.1-1.514)	0.173
Advanced degree	1 (3.13%)	0 (0%)	-	-

Table 4 All characteristics crosstab (con.)

Factors	≥4 points of expected LOC (32)	Within 4 points of expected LOC (98)	Relative risk (95%CI)	P-value
Monthly income				
Less than 10,000 THB	18 (56.25%)	45 (45.92%)	1	
10,001-20,000 THB	9 (28.13%)	36 (36.73%)	0.625 (0.251-1.556)	0.313
20,001-50,000 THB	5 (15.63%)	17 (17.35%)	0.735 (0.236-2.292)	0.596
50,001-100,000 THB	0 (0%)	0 (0%)	-	-
Type of operation				
General surgery	8 (25%)	26 (26.53%)	1	
Orthopedic	17 (53.13%)	54 (55.1%)	1.023 (0.391-2.677)	0.963
Urological	7 (21.88%)	15 (15.31%)	1.517 (0.458-5.02)	0.495
Gynecological	0 (0%)	3 (3.06%)	-	-
Duration of surgery	124.84±51.17	109.49±40.38	1.008 (0.999-1.017)	0.087
Source of expectation				
Anesthesiologist/ anesthesia provider	18 (20.93%)	68 (79.07%)	1	
Surgeon /member of surgical team	2 (28.57%)	5 (71.43%)	1.511 (0.271-8.440)	0.638
Nurse	3 (60%)	2 (40%)	5.667 (0.879-36.514)	0.068
Other	1 (8.33%)	11 (91.67%)	0.343 (0.042-2.838)	0.321
Do not know/ do not remember	8 (40%)	12 (60%)	2.519 (0.895-7.086)	0.080
Preoperative anxiety†	3.5±2.06 (1-10)	2.73±1.5 (1-7)	1.297 (1.025-1.642)	0.03*
Perioperative comfort†	3.19±1.57 (1-6)	2.55±1.32 (1-6)	1.369 (1.032-1.815)	0.029*
Satisfaction score†, ‡	8.69±1.03 (7-10)	9.13±0.85 (7-10)		0.031*

†Data are expressed as mean±S.D. (min-max), * p <0.05, ‡ Mann-Whitney U test

Table 5 Multivariate analysis

Factors	≥4 points of expected LOC (32)	Within 4 points of expected LOC (98)	Relative risk (95%CI)	P-value	Adjusted Relative risk (95%CI)	P-value
Preoperative anxiety	3.5±2.06 (1-10)	2.73±1.5 (1-7)	1.297 (1.025-1.642)	0.03*	1.235 (0.966-1.578)	0.092
Perioperative comfortable	3.19±1.57 (1-6)	2.55±1.32 (1-6)	1.369 (1.032-1.815)	0.029*	1.284 (0.961-1.717)	0.091

Data are expressed as mean±S.D. (min-max), *p<0.05

Table 6 Overall anesthetic experience and source of expectation/ satisfaction score

	As expected	Better	Worse	P-value
Anesthesiologist/ anesthesia provider	78 (70.27%)	7 (63.64%)	1 (12.5%)	0.005*
Other personnel /none	33 (29.73%)	4(36.36%)	7 (87.50%)	
Satisfaction score, mean±S.D. (min-max)	9.07±0.86 (7-10)	9.36±0.81 (8-10)	7.88±0.99 (7-10)	<0.001*

* p <0.05

Discussion

As regional anesthesia becomes part of mainstream anesthetic care, the concept of best practice regarding neuraxial technique has been refined continuously. Nevertheless, patients' anticipation toward level of consciousness during RA is relatively disregarded. From anesthesia provider's perspective, the goal of anesthetic care in RA is not complete unconsciousness; on the contrary, there were complaints of intraoperative awareness from patients who underwent RA. This misconception indicates a failure of informed consent and the establishment of appropriate expectations concerning experience of the procedure.

This study focused mainly on patients who received neuraxial technique dissimilar to the previous ones, which had included MAC cases. Therefore the study results could be a better representative for a population in terms of external validation. Contrast to the study by Esaki et al.[12] complete unconsciousness was not the most frequent expectation by the participants who underwent RA at Hua Hin Hospital.

Instead, approximately 40% of the patients in this study anticipated just being semiconscious during the operation.

From statistical analysis, although preoperative anxiety and perioperative comfort correlated with having at least 4-point difference from expected level of consciousness as stated in the univariate model, no independent predictor was found in multivariate analysis.

Interestingly, patient expectation regarding level of consciousness might be influenced by non-anesthesia personnel. Combining with fast-paced and stressful pre-procedural environment, these factors hold a great potential for miscommunication. Therefore, anesthesia providers should clearly set appropriate expectations preoperatively. This is especially important as only 66% of patients had their expectations set by the anesthesiologists/anesthesia providers during the preoperative visit. Furthermore, this study also found that anesthesiologists/anesthesia provider, as a source of expectation were associated with overall anesthetic experience significantly. This highlights the importance of pre-procedural communication between anesthesia team and patients respecting the degree of expected amnesia and sensations that patients may experience during these procedures.

In addition, the author believes that the study outcome reflects a problematic system in preoperative visit coverage of the hospital and inadequate communication during the informed consent process due to disproportion between anesthesia personnel and their workload. These issues could be further studied and addressed with the hospital administrators as well.

There are some limitations in this study. The author was partly involved with the survey administration, which could lead to interviewer bias. It was based on assessment of the subjective experience of the patient only. In future research, the process of obtaining informed consent and patient knowledge in RA could be further investigated. Additonally, intraoperative objective assessment might be conducted if feasible.

Conclusion

Although being semiconscious is most desirable during RA, certain patients might have some unmet expectation concerning level of consciousness, that could affect overall satisfaction. With recognition of this problem, anesthesiologists and anesthesia providers, as the primary source of expectation, must educate, make through thorough communication with patients, in the preoperative service accordingly, setting more realistic expectations.

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