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Factors Associated with Poor Satisfaction with Anesthesia in Patients Who Had Previous Surgery: A Retrospective Study

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Abstract

Background: As most studies investigating patient satisfaction with anesthesia have some bias, previous results may underrepresent the true level of dissatisfaction with anesthesia.
Objectives: This study aimed to identify factors associated with patient satisfaction with anesthesia.
Methods: Data from patients aged ≥ 20 years who had previous surgery and were scheduled for additional surgery were obtained retrospectively through preoperative interviews conducted. Informed consent for anesthesia was obtained by an anesthesiologist prior to the additional surgery. The patients were assigned to one of four anesthesia satisfaction levels, then were categorized into two groups; a high satisfaction group and a low satisfaction group. After comparing parameters between the two groups, logistic regression analysis was performed to identify factors that were negatively associated with satisfaction with anesthesia.
Results: Of 478 patients interviewed subjects, 469 patients were analyzed. Five individuals were excluded because they were unable to provide informed consent, and four subjects were excluded because they were aged < 10 years at the time of their previous surgery. Age < 65 years, previous surgery for malignancy, female sex, estimated operation duration < 3 hours, and American Society of Anesthesiologists Physical Status score 1 or 2 were included in a logistic regression analysis. Age < 65 years, previous surgery for malignancy, and female sex were predictive of poor patient satisfaction with anesthesia. Reasons for poor satisfaction with anesthesia included postoperative shivering and chills, fear of surgery, ineffective spinal anesthesia, and postoperative surgery-related pain. Of the patients awaiting surgery for malignancy, 57.3% had previous surgery for malignancy.
Conclusions: Age < 65 years, previous surgery for malignancy, and female sex were negatively associated with patient satisfaction with anesthesia. These factors should be considered when preparing patients for future procedures to improve postoperative patient satisfaction.

Keywords: Anesthesia, Patient Satisfaction, Preoperative Interview

1. Background

Patient satisfaction is an important indicator of the quality of services in the field of anesthesiology (1, 2). Previous studies, investigating patient satisfaction with anesthesia have reported data on evaluating satisfaction with anesthetic pre-assessment based on a questionnaire or a single question or evaluating satisfaction postoperatively via a visual analog scale (3-5). Patient satisfaction is a subjective and complex concept, involving physical, emotional, mental, social, and cultural factors (6). It is determined by the quality of the care provided and the patient's expectations of that care. Patient-reported satisfaction with anesthesia is generally high (4, 7-9). Since patient responses may be modified to please hospital or surgical staff (10); hence, the results of previous reports may not accurately reflect the true level of patient dissatisfaction with anesthesia. Thus we think that patient satisfaction with anesthesia should be evaluated postoperatively after a certain period of time.

A preoperative interview conducted the day before the surgery is often the only opportunity for patients to discuss any fears or anxiety they may encounter, regarding their anesthesia and/or surgery with an anesthesia staff member. Feeling of anxiety, vulnerability, confusion, or mistrust may dominate their thought processes. Such feelings can restrict their ability to process new information or to freely provide informed consent (11). Major studies related to patient satisfaction have this form of bias, which affects their results. A retrospective study can reflect patient satisfaction without that bias.

In our clinical experience, some patients with cancer exhibited "grief cycle phases" similar to those described by the Kueber-Ross model (12).

2. Objectives

We expected that in the current study, malignancy was the reason for a previous surgery, and the scheduled surgery had a significant influence on patient satisfaction with anesthesia. The present study investigated preoperative patient satisfaction with anesthesia in patients who had previous surgery under general anesthesia or local anesthesia and were scheduled to undergo another operation. Data derived from preoperative interviews with patients before the scheduled additional operation were reviewed in an effort to identify factors that influenced patient satisfaction with anesthesia.

3. Methods

The protocol of this retrospective observational study was approved by the Ethics Committee of Osaka Medical College (reference code 1713Rin-123), which waived the requirement for informed consent because of the retrospective design of the study. Data derived from patients aged $\geq$ 20 years who had previous surgery under general anesthesia or local anesthesia were obtained by reviewing the information recorded during a preoperative interview conducted for the purpose of obtaining informed consent for anesthesia between January and February 2015. Patients who were scheduled to undergo electroconvulsive therapy and those who were going to undergo an emergency operation were excluded from the study.

An anesthesiologist with 13 years of experience performed all preoperative interviews in a preoperative interview room on the same floor as the operating rooms, in the presence of an experienced staff nurse. The interviews included both open and closed questions. During the interview, an anesthesia care plan was developed after careful investigation of medical, surgical, and anesthesia histories. The patient was educated about anesthesia, their choices of anesthesia were reviewed, and the risk factors associated with the anesthesia were discussed. All interviews were conducted on the workday before the surgery. If the patient could not move from their ward to the preoperative interview room, the interview was conducted at their bedside. A brochure was given to each patient prior to admission to the hospital. The brochure briefly described general anesthesia, epidural anesthesia, and spinal anesthesia. Before the above-described preoperative interview, the patient watched a video in which general anesthesia, epidural anesthesia, and spinal anesthesia were explained and the possible complications of anesthesia were discussed.

The information about previous surgeries at our institute and other institutes was collected. Meanwhile reviewing patient requests and dissatisfaction recorded in preoperative records, patient satisfaction with previous anesthesia was assigned to one of four levels (Table 1) (9). Level 1 was defined as "satisfied". Level 2 was defined as "somewhat dissatisfied". Level 3 was defined as "dissatisfied". Level 4 was assigned if a patient rejected surgery and their surgeon requested consultation with a psychiatrist. Patients were not specifically asked whether they were "satisfied", "somewhat dissatisfied", or "dissatisfied" with the anesthesia they had previously undergone. The patients were asked if they had any complaints about their previous anesthesia, and in cases where they did the reasons for those complaints were explored as a routine component of the preoperative interview. The patients were divided into two groups prior to further analysis, a "high satisfaction" group containing those whose satisfaction was rated level 1, and a "low satisfaction" group containing those whose satisfaction was rated level 2, 3, or 4. These two groups were then compared to identify factors that were positively or negatively associated with satisfaction with anesthesia.

3.1. Statistical Analysis

In group comparisons, Mann-Whitney U test was used for continuous variables and chi-square test or Fisher's exact test were used for categorical variables. Logistic regression analysis was performed using the categorical variables that yielded significant P values (< 0.05) in the univariate analysis. SPSS V. 22 (IBM, Armonk, NY) was used for all statistical analyses.

4. Results

A total of 478 adult patients were interviewed preoperatively by the anesthesiologist. Five patients who were unable to provide written informed consent were excluded from the analysis; 1 with Parkinson's disease, 1 with atypical psychosis with hospitalization in accordance with the Medical Care and Protection of the Mental Health and Welfare Law in Japan, 1 with schizophrenia, 1 with an American Society of Anesthesiologists Physical Status score of 4 (13) under intubation, and 1 with mental retardation. Four patients whose only previous surgery occurred when they were under 10 years of age were also excluded from the

Table 1. Categorization of Patient Satisfaction Level and Group

	Satisfaction Level	Number of Cases[a] (N = 469)	Group
No complaint or satisfied	1	415 (88.5)	High satisfaction
Complaint or somewhat dissatisfied	2	38 (8.1)	Low satisfaction
Complaint with anger or despair, or dissatisfied	3	14 (3.0)	Low satisfaction
Rejection of surgery, prompting a suggested psychiatrist consultation	4	2 (0.4)[b]	Low satisfaction

[a] Values are expresses as No. (%).
[b] Two patients initially declined surgery, but they ultimately agreed to it.

analysis. Of the 478 patients interviewed, therefore, 469 patients were analyzed.

Table 2 shows the wide variety of previous operations that the patients underwent in the present study. Table 3 shows the causes of patient dissatisfaction with anesthesia. The previous experiences of patients in the low satisfaction group included failed epidural tube insertion before the surgery, pain during spinal anesthesia intervention, difficulty of spinal anesthesia, iatrogenic dermatitis, ineffective spinal anesthesia during cesarean section and/or transurethral resection, intraoperative asthma, postoperative vomiting, difficulty breathing postoperatively due to pneumothorax, postoperative surgical pain, postoperative confusion, and postoperative syncope caused by bleeding or Wolff-Parkinson-White syndrome. Age, sex, American Society of Anesthesiologists Physical Status score, previous surgery for malignancy, and estimated operation duration differed significantly in the high satisfaction and low satisfaction groups (Table 4). Age < 65 years, previous surgery for malignancy, and female sex had significant effects on anesthesia satisfaction (Table 5). Of the 260 patients who were scheduled to undergo surgery for malignancy, 149 (57.3%) previously underwent surgery for malignancy.

5. Discussion

In the present study, age < 65 years and female sex were significantly associated with poor patient satisfaction with anesthesia in patients who had previous surgery and were scheduled to undergo another operation. These findings are concordant with previous studies investigating patient satisfaction with anesthesia (7, 9, 14). In addition to those variables, we thought that prior surgery for a malignant tumor would be significantly associated with poor satisfaction with anesthesia. We expected that patients who underwent surgery for a malignant tumor would report poor satisfaction with anesthesia. Such patients are likely to go through a grief cycle due to their cancer diagnosis (12), and it is likely that some would be in a state of denial or anger. Having previously surgery for malignancy was negatively associated with satisfaction with anesthesia. Notably however, it did not seem that the cause was being scheduled for subsequent surgery for malignancy. More than half of the patients who were scheduled to undergo surgery for malignancy experienced a surgical procedure in the past for a similar reason. Although we thought that those patients may be better prepared to accept the scheduled surgery, patients who had previous surgery for malignancy had dissatisfaction with anesthesia.

Many factors are known to contribute to postoperative patient satisfaction, including accessibility and convenience of services, institutional structure, interpersonal relationships, competence of health professionals, information leaflets, the provision of nurses devoted to anesthesia, and the patient's own expectations and preferences (15-17). Recovery from anesthesia and surgery is sometimes complicated by pain, nausea, vomiting, anxiety, and a variety of other major and minor complaints (8, 9). Postoperative complications reportedly affect postoperative patient satisfaction (9, 14). In the present study, a significantly lower number of patients in the high satisfaction group had postoperative complications than in the low satisfaction group.

Because this was a retrospective observational study, we reviewed the information that was recorded in patients' medical records. Specifically, we focused on information obtained during a preoperative interview with an anesthesiologist that was aimed at obtaining informed consent for anesthesia. As well as seeking informed consent, during this interview, the anesthesiologist provided an explanation of the anesthesia that was to be administered, and obtained relevant information pertaining to previous surgery and types of anesthesia administered, any unexpected events, postoperative complications, and complaints recalled by the patient. The patients approached and analyzed in the present study were often anxious and preoccupied, and could have also been compromised by their current medical conditions. These factors might contribute to negative recollections of their past experiences (18).

Table 2. Types of Previous Surgery[a]

	Total (N = 469)	High Satisfaction Group (N = 415)	Low Satisfaction Group (N = 54)
Gastrointestinal	102 (21.7)	89 (21.4)	13 (24.1)
Urological	79 (16.8)	64 (15.4)	14 (25.9)
Orthopedic	56 (11.9)	51 (12.3)	5 (9.3)
Gynecological	46 (9.8)	37 (8.9)	9 (16.7)
ENT/faciomaxillary	45 (9.6)	42 (10.1)	3 (5.6)
Neurological	32 (6.8)	29 (6.2)	3 (5.6)
General thoracic	30 (6.4)	30 (7.2)	0 (0.0)
Cardiovascular	27 (5.8)	27 (6.5)	0 (0.0)
Mammary	17 (3.6)	15 (3.6)	2 (3.7)
Plastic	13 (2.8)	13 (3.1)	0 (0.0)
Ophthalmological	8 (1.7)	8 (1.9)	0 (0.0)
Obstetric	8 (1.7)	5 (1.2)	3 (5.6)
Dental	6 (1.3)	4 (1.0)	2 (3.7)

Abbreviation: ENT, ear, nose, and throat.
[a]Values are expressed as No. (%).

Table 3. Causes of Dissatisfaction with Anesthesia in the Low Satisfaction Group (N = 54)

Event	Number of Cases
Intraoperative	
Fear of adverse events during anesthesia	8
Ineffective spinal anesthesia	8
Teeth or soft tissue injury	4
Intraoperative awareness	1
Pain at the site of regional anesthesia	1
Intravenous line complication/s	1
Postoperative	
Shivering or chills	9
Surgery-related pain	7
Hoarseness	5
Vomiting	4
Confusion	4
Neurological deficit	4
Throat pain	2
Dyspnea	2
Asthma	2
Headache	1
Hallucination	1
Urinary retention	1
Perioperative	
Communication issues with anesthesiologists	4

The current study had several limitations. One is that because the study was retrospective and observational, patients were not specifically asked whether they were "satisfied", "somewhat dissatisfied", or "dissatisfied" with anesthetic services they had received previously. Patients were asked if they had any complaints about their previous anesthesia, and in cases where they did the reasons for those complaints were explored during the preoperative interview as a routine matter. Possibly, it was a difference between patient satisfaction with anesthesia and having no complaints about their previous anesthesia. Furthermore, differentiation between "patient satisfaction with previous anesthesia" and "quality of recovery from the previous surgery" is problematic. Some of the patients' comments were focused on the perioperative experience and not specifically on their anesthetic care (19). Previous poor recovery may influence patient satisfaction (20). Another limitation is that we did not analyze data pertaining to the time when previous surgery was conducted, or how many times previous surgery had been conducted. Finally, the place where the previous surgery had been conducted was not analyzed in the present study. These factors pertaining to time and location might influence the patient satisfaction with anesthesia.

5.1. Conclusions

Age < 65 years, previous surgery for malignancy, and female sex were negatively associated with satisfaction with anesthesia in patients who had previous surgery and were scheduled for another operation. Those patients who had previous surgery for malignancy expressed dissatisfaction. Other factors contributing to poor postoperative satisfaction with the previous surgery were fear of the operation, shivering and chills, ineffective spinal anesthesia, and postoperative surgical pain. These factors should be taken

Table 4. Comparisons of Characteristics Between the Two Groups[a]

Variables	High Satisfaction Group (N = 415)	Low Satisfaction Group (N = 54)	P Value
Patient characteristics			
Age, y	68 (55 - 75)	57 (42 - 68)	< 0.001
Age < 65 y	149 (35.9)	35 (64.8)	< 0.001
Male	223 (53.7)	19 (35.2)	0.010
ASA-PS 1	313 (75.4)	48 (88.9)	0.027
ASA-PS 2 or 3	102 (24.6)	6 (11.1)	0.027
Data pertaining to previous surgery			
Number of previous surgeries	1 (1 - 2)	1 (1 - 2)	0.597
Previous surgery for malignancy[b]	179 (43.1)	32 (59.3)	0.026
Event during general anesthesia	8 (1.9)	37 (68.5)	< 0.001
Event during spinal anesthesia	4 (1.0)	18 (14.8)	< 0.001
Postoperative complication	3 (0.7)	42 (77.8)	< 0.001
Data pertaining to scheduled surgery			
Surgery for malignancy	226 (54.5)	34 (63.0)	0.237
Estimated operation duration	3.5 (2 - 4)	2 (2 - 4)	< 0.001
Estimated operation duration < 3 hours	138 (33.3)	28 (51.9)	0.007
Admission to intensive care unit planned	58 (14.0)	3 (5.6)	0.089

Abbreviation: ASA-PS, American Society of Anesthesiologists Physical Status.
[a]Values are expressed as median (IQR) or as No. (%).
[b]Data were missing for one patient.

Table 5. Results of Logistic Regression Analysis[a]

Variables	P Value	Odds Ratio	95% Confidence Interval
Age < 65 y	< 0.001	3.23	1.71 - 6.10
Previous surgery for malignancy	0.007	2.35	1.26 - 4.38
Female sex	0.026	2.03	1.09 - 3.80
Estimated operation duration < 3 h	0.116	1.63	0.89 - 2.98
ASA-PS 1 or 2	0.529	1.35	0.53 - 3.44

Abbreviation: ASA-PS, American Society of Anesthesiologists Physical Status.
[a]Accuracy 88.5%, Hosmer - Lemeshow, P = 0.940.

into account when explaining procedures to patients and providing patient education for future procedures in order to improve postoperative patient satisfaction.

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Footnotes

Authors' Contribution: Junko Nakahira designed the study, interpreted the data, and drafted the manuscript. Toshiyuki Sawai collected the data and reviewed the manuscript. Junichi Ishio confirmed the analysis of the data and reviewed the manuscript. Shoko Nakano collected the data and helped to draft the manuscript. Toshiaki Minami designed the study and reviewed the manuscript. All authors have read and approved the final manuscript.

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