

A comprehensive analysis of patient satisfaction with anesthesia

ABSTRACT

Background: Patient satisfaction with anesthesia after surgical treatment is a complex concept that includes not only the level of satisfaction with the anesthesia itself but also the presence of fears, worries, depression, evaluation of the anesthesiologists' work, as well as cognitive dysfunction as a possible negative consequence of anesthesia.

Objective: Conducting a comprehensive analysis of patients' satisfaction with anesthesia.

Methods: Questionnaire of patients' satisfaction with anesthesia (Sinbukhova E.V., Lubnin A.Yu.), State-Trait Anxiety Inventory in the adaptation by Y.L. Hanin, Assessment of Depression, The Montreal Cognitive Assessment (MoCA), and Frontal Assessment Battery. Population consisted of 202 patients.

Results: Satisfaction with anesthesia: assessment "good and higher" with primary anesthesia – 59.7% of patients with repeated – 70% of patients. The most common factors that reduce the assessment of patients' satisfaction with anesthesia are: strong excitement before surgery about operation and anesthesia, no postoperative visit of the anesthesiologist, no visit of the anesthesiologist before the operation, not enough attention of anesthesiologist in the surgery room before anesthesia, nausea, vomiting, pain, dizziness, general discomfort, and thirst. MoCA cognitive assessment before and after anesthesia: $P < 2.2 \times 10^{-16}$ (significant decrease). Depression: major depression in 52% of patients, subclinical depression in 22.8%.

Conclusion: Regular survey of patients' satisfaction should help to improve the quality of medical care. The strong excitement of the patient about the upcoming anesthesia and surgery, and the presence of a high level of anxiety and depression can be factors of reducing the patients' satisfaction with anesthesia. It requires psychological support of patients at the stage of surgical treatment.

Key words: Anesthesia; depression; postoperative cognitive dysfunction; satisfaction

Introduction

Patients' satisfaction with anesthesia after surgical treatment is an important part of the quality of medical care. One of the definitions of patient satisfaction is: the degree of correspondence between expectation and what was obtained as a result,^[1] the other – according to Pascoe, satisfaction is

the patients' reaction consisting of emotional response and cognitive assessment of the care received.^[2]

According to the researches

In Saudi Arabia (2018) (300 patients), the level of satisfaction with anesthesia was moderate in 56.5% of patients, and almost half of the patients were not satisfied with anesthesia for

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various reasons.^[3] In Belgium (2017), according to the data of various aspects of care, 59.1% of patients were very satisfied and 38.9% of patients were simply satisfied;^[4] in Japan (2001), 59% were satisfied with anesthetic provision; and in Ethiopia, the total amount of patients satisfied with anesthetic support was 90.4%.^[5] In the Polish study (250 patients after general and local anesthesia), on the third day after surgery, 87% of patients expressed a positive opinion about the quality of anesthesia.^[6]

According to the data of Heidegger and colleagues, the degree of satisfaction with anesthesia is overly optimistic and sometimes is not genuine.^[1]

Patients' satisfaction with anesthesia after surgical treatment remains the best way to assess the effectiveness from the point of patients' view, it is an important result of hospital care. According to the study, a visit of the anesthesiologist to the patient after surgery was recognized as one of the main factors affecting the degree of patients' satisfaction with anesthesia.^[5] Thus, the importance of regular monitoring of patients' satisfaction level, including anesthesia satisfaction during operations is an urgent task. A regular survey of patients' satisfaction will help to improve the quality of medical care.

Patients' satisfaction with anesthesia is a complex concept that includes not only the level of satisfaction of anesthesia itself but also the presence of fears, depression, worries, evaluation of the anesthesiologist work, as well as cognitive dysfunction as a possible negative consequence of anesthesia. The active study of postoperative cognitive dysfunction (POCD) frequency begins from 1980s of the last century. The frequency of POCD or "perioperative neurocognitive disorders" as it was recommended in 2018 should be called cognitive impairment associated with anesthesia and surgery, diagnosed in the period up to 30 days after anesthesia (delayed neurocognitive recovery) and up to 12 months (postoperative neurocognitive disorder^[7]) and is often underestimated. It mainly occurs in the elderly but can occur in young patients too. In a week after surgery a significant cognitive decline in 19–41% of patients over 18 years and the increased frequency in 3 postoperative months was detected in patients >60 years,^[8] after anesthesia in the middle aged (49.5 years) in the early postoperative period cognitive decline was revealed on the sixth day after surgery.^[9]

Improvements in health care today lead to a steady increase in the number of geriatric population and consequently, increasingly surgical treatment is carried out in older patients with the presence of many comorbidities. According to

a randomized, double-blind, placebo-controlled clinical trial (2016), a quarter of elderly patients experience cognitive decline after surgery which leads to increased morbidity, longer hospital stays, and mortality. Postoperative cognitive dysfunction primarily affects memory, psychomotor skills, executive functions,^[8-13] and there is also an increased risk of development of Alzheimer's disease.^[14] Long-term surgery (anesthesia), old age and pre-existing cognitive impairment, use of drugs and alcohol in history, smoking, trauma, infections, iatrogenic complications, anemia, acute pain, sleep disorders, etc., are predisposing and provoking factors of postoperative cognitive dysfunction.^[12] There are differences in researches methods of patients' testing to detect POCD, as well as disputes about the duration of this dysfunction. As large studies of POCD problem showed patients who had anesthesia and surgery could have an increased risk of dementia developing years after it.^[13,15,16] Cognitive dysfunction in the early postoperative period can be a predictor of cognitive decline and after 5 years^[17] or 7.5 years later.^[7] It is assumed in elderly patients, for example, with coronary heart disease, cognitive decline is associated with the development of the disease itself and not only with the factors of cardiac surgery, cardiopulmonary bypass, or directly the anesthesia itself.^[18] According to another study, POCD does not depend on surgery or choice of anesthetic at the population level.^[19] A systematic review (2018), using the MRI including 269 surgical patients, 36 patients of the control, and 55 healthy persons of control group, shows that a decrease in thalamic and hippocampal volumes and a decrease in cerebral blood flow may be associated with postoperative cognitive dysfunction, whereas preoperative and postoperative pathology of the white matter may be associated with postoperative delirium. However, there is a need for further research to confirm/refute the data.^[20]

Aim of our study was conducting a comprehensive analysis of patients' satisfaction with anesthesia.

Materials and Methods

Ethical considerations Ethical approval for this study was provided by the Ethical Committee "N. N. Burdenko National Medical Research Center of Neurosurgery" of Ministry of Health of the Russia Federation, 16, 4th Tverskaya-Yamskaya St., Moscow, Russia (chairman Konovalov A.N.), 6 March 2018.

All participants of the study signed a written informed consent to participate in this study.

Questionnaire of patients' satisfaction with anesthesia (Sinbukhova E.V., Lubnin A.Yu.), State-Trait Anxiety

Inventory (STAI) in the adaptation by Y. L. Hanin, Assessment of Depression (HADS), The Montreal Cognitive Assessment (MoCA), and Frontal Assessment Battery (FAB).

The survey of each patient after anesthesia was carried out on the third day after surgery using all the declared scales. MoCA and FAB cognitive assessment were conducted twice: before surgery and on the third day after it.

Inclusion criteria

- Population-A: surgical treatment for chronic pain syndrome; population-B: surgical treatment for a pituitary tumor
- Age ≥ 18 years
- MoCA ≥ 16 points on examination on the third day after surgery
- Signed informed consent.

Exclusion criteria

- MoCA < 16 points
- Aphasia disorders
- Unconscious patients at the time of the study.

Questionnaire of patients' satisfaction with anesthesia (Sinbukhova E.V., Lubnin A.Yu.) was developed to assess patients' anesthesia satisfaction; it covers well-known aspects that contribute to patients' satisfaction with anesthetic management. It consists of 57 questions: including series of general questions for the patient such as age, gender, type of pathology, etc., and series of questions for the patient, evaluation in which is performed in points (questions from 14 to 52 inclusive). Satisfaction score varies from 36 points (bad) to 156 points (very good). It also includes the score of satisfaction from 0 to 10 (where 10 is totally satisfied and 0 is totally not satisfied).

It is allowed to use this questionnaire only with reference to the authors. The full version of the questionnaire was published in the Russian journal of Anaesthesiology and Reanimatology (2019, in Russian).^[5]

A questionnaire using criteria: ≥ 18 years, data on the Montreal cognitive assessment scale (MoCA) ≥ 16 points. The survey of each patient after anesthesia is carried out on the third day after surgery.

Results and Discussion

Statistical analysis was performed with R-Studio Version 1.0.153© 2009–2017. Linear regression was used for detections of relationship between the variables. Mann–Whitney U-test was used for assessing the differences

between 2 independent samples. A value of $P < 0.05$ was considered statistically significant.

Population: 202 patients (114 women and 88 men). The average age of 50.2 years (standard deviation 15,5).

The average duration of anesthesia was: population-A: 226.95; population-B: 109.65 min.

This anesthesia was the primary general anesthesia for 30.7% of patients, and 69.3% had a previous history of general anesthesia.

Cognitive functions were evaluated twice: before surgery and on the third day after it. The data are presented in Figure 1.

Thus, as we can see from Figure 1, before surgery, the median of cognitive assessment was 27 points (from 21 to 30 points), the average value 26.8, after surgery, the median was 24 points (from 16 to 30 points), the average value 23.4. If before surgery the average value according to the data of the majority of patients corresponded to the limit of the norm according to the average value of cognitive function assessment, then after anesthesia, the obtained data corresponded to the cognitive decrease. Comparison of data (MoCA) before and after anesthesia ($P < 2.2 \times 10^{-16}$) showed a significant cognitive decline after anesthesia.

No significant difference between population-A and population-B was found.

FAB: before the surgery, the median of cognitive assessment was 16 points (13 to 18 points) with an average value of 16.03 points. After anesthesia, the median was 13 points (from 11 to 15 points), with an average value of 13 points. Comparison of data before and after anesthesia ($P < 2.2 \times 10^{-16}$) showed a statistically significant decline.

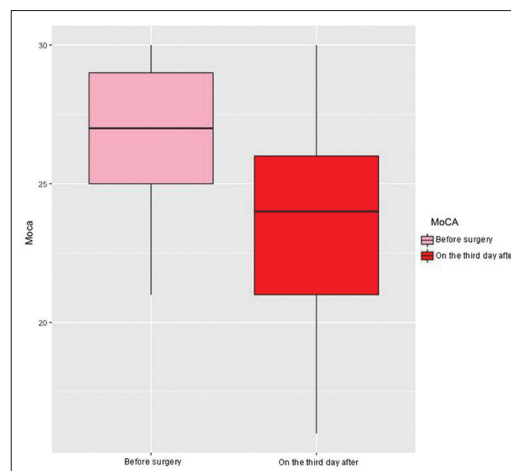


Figure 1: Montreal Cognitive Assessment ($n = 202$)

The assessment of depression level (HADS) performed on the third day after surgery is presented in Figure 2.

Thus, as we can see from Figure 2, median assessment was 11 points, which corresponds to depression. The average value was 10.5 (from 1 to 18 points). 25.2% of patients did not have depression, 22.8% had subclinical depression, and 52% had major depression.

Evaluation of situational anxiety performed on the third day after surgery is presented in Figure 3.

Thus, as we can see from Figure 3: the median of situational anxiety on the third postoperative day was 45 points. The average value was 47.06 (25 to 79 points). The median of personal anxiety on the third postoperative day was 46 points. The average value was 46.73 (23 to 75 points). High situational anxiety was revealed in 58.4% of patients, moderate in 36.1%, the norm value was revealed only in 5.4% of patients. High personal anxiety was detected in 54.5% of patients, moderate in 40.6%, the value of the norm was revealed only in 5% of patients.

These estimations of patients' satisfaction with anesthesia were divided into 1 groups: 1-group consisted of patients with primary anesthesia, 2-group consisted of patients who had previous experience of general anesthesia (1-group: $n = 62$; 2-group: $n = 140$).

Depression, situational, and personal anxiety, satisfaction with anesthesia in all groups in value: Minimum, median, average mean and maximum are in Table 1.

Report the regression model used to assess the associations between the results. Significant results are shown in Table 2.

Thus, linear regression reveals the relationship between 2 variables: satisfaction with anesthesia and depression level. However, the satisfaction could not be explained by depression level only. Other statistical variables in the regression model were not statistically significantly related to the level of patients' satisfaction.

According to the questionnaire of patients' satisfaction with anesthesia (Sinbukhova E.V., Lubnin A.Yu.), the points score can range from 36 (bad) to 156 points (very good). We assume that a score of ≥ 130 is a good value, and a score < 100 indicates a fairly low patients' satisfaction. The data are presented in Figure 4.

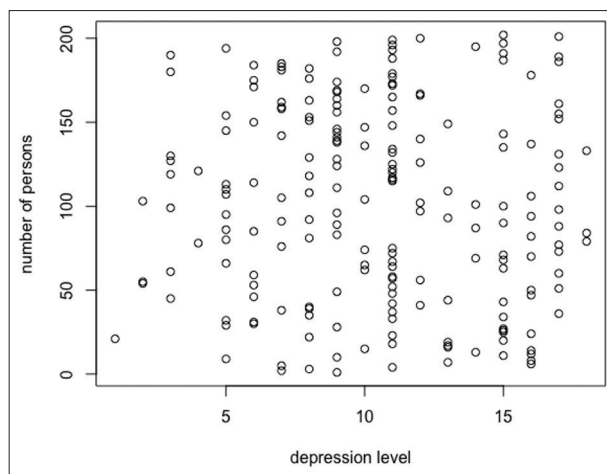


Figure 2: Assessment of depression level ($n = 202$)

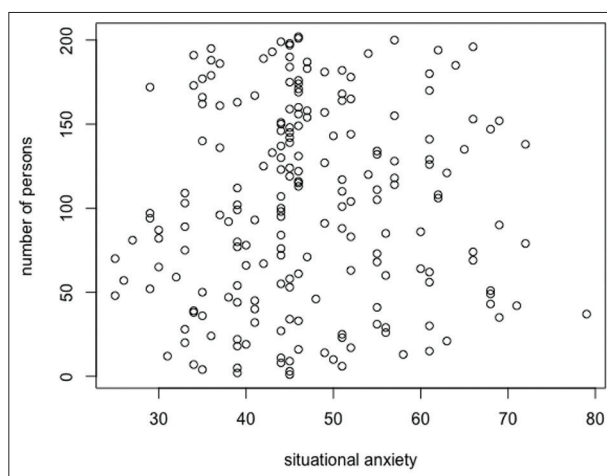


Figure 3: Assessment of situational anxiety ($n = 202$)

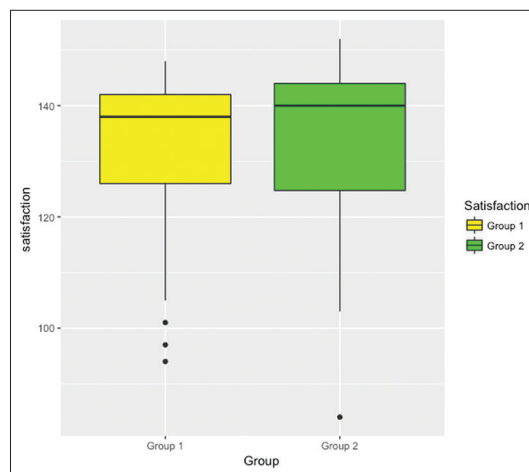


Figure 4: Patients' satisfaction with anesthesia: 1-group ($n = 62$), 2-group ($n = 140$)

In our study with primary anesthesia, only 2 people chose a score < 100 points, with repeated anesthesia in 1 patient. However, rates "good or above" (130 points) were selected

Table 1: Depression, situational, and personal anxiety, satisfaction with anesthesia in 1-group (with primary anesthesia) and in 2-group (who had previous experience of general anesthesia)

Depression	Situational anxiety	Personal anxiety	Satisfaction with anesthesia
1-group (n=62)			
Min.: 1.00	Min.:26.00	Min.:23.00	Min.:94.0
Median:11.00	Median:45.00	Median:46.00	Median:138.0
Mean:10.55	Mean:47.16	Mean:45.76	Mean:132.1
Max.:17.00	Max.:69.00	Max.:72.00	Max.:148.0
2-group (n=140)			
Min.:2.00	Min.:25.00	Min.:25.00	Min.: 84.0
Median:10.50	Median:45.50	Median:45.50	Median: 140.0
Mean:10.45	Mean :47.01	Mean:47.16	Mean: 134.1
Max.:18.00	Max.:79.00	Max.:75.00	Max.:152.0

Table 2: Regression analysis of prediction of patients' satisfaction with anesthesia by depression level in 1-group and 2-group

	Estimate	SE	T	P
1-group (n=62)				
Intercept	141.0237	4.3126	32.70	<2e-16 ***
Depression	-0.8478	0.3786	-2.24	0.0288 *
2-group (n=140)				
Intercept	141.5606	2.9589	47.843	<2e-16 ***
Depression	-0.7180	0.2635	-2.725	0.00727 **

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

by 59.7% of patients with primary anesthesia and by 70% of patients with repeated. Nevertheless, when using Mann–Whitney U-test (1-group and 2-group, P value = 0.15), no significant difference was found.

The most common factors that reduce the assessment of patients' satisfaction with anesthesia were: no postoperative visit of the anesthesiologist, no visit of the anesthesiologist before the operation, not enough, in the opinion of the patient, attention to him of anesthesiologist in the surgery room before anesthesia, nausea, vomiting, pain, dizziness, general discomfort, thirst, and strong excitement before the operation about the upcoming operation and anesthesia.

Out of these factors, the largest number of complaints were made by patients of fear and excitement before surgery and general anesthesia. Out of 202 patients in the study – to the question of the questionnaire “I was worried about anesthesia before surgery”: “very worried” – 71.29% of patients; “strongly” – 21.29% of patients; “moderately” – 6.5% of patients; “not worried” – 0.1% of patients.

Thus, the patients' strong excitement about the upcoming anesthesia and surgery, and the presence of a high level of anxiety and depression can be a factor reducing the patients'

satisfaction with anesthesia. It requires psychological support of patients at the stage of surgical treatment.

Conclusion

The importance of regular monitoring of patients' satisfaction levels including satisfaction with anesthesia after surgery is an actual task. A regular survey of patients' satisfaction will help to improve the quality of medical care.

The program aimed at increasing patients' satisfaction with anesthesia should include medical literacy of the doctor, improvement of communication between the anesthesiologist and the patient, provision of medical information, participation of the patient in decision-making concerning treatment, effectiveness of the received treatment, and continuous monitoring of patients' satisfaction with anesthesia.

Strong patients' anxiety about the upcoming anesthesia and surgery, and the presence of a high level of depression can be a factor reducing patients' satisfaction with anesthesia. It requires psychological support of patients at the stage of surgical treatment.

Comparison of data before and after anesthesia showed a significant cognitive decline after anesthesia. Thus, the development of measures for the prevention and correction of possible cognitive decline after using general anesthesia remains an urgent task for future researches.

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Conflicts of interest

There are no conflicts of interest.

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