

Preoperative Anxiety in Adult Patients Undergoing Day Care Surgery: Prevalence and Associated Factors

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ABSTRACT

Background: There is a paucity of data related to anxiety levels in patients undergoing day care surgery in India. **Methods:** Preoperative anxiety was assessed using Amsterdam Preoperative Anxiety and Information Scale (APAIS) 1 day before surgery and on the day of surgery, and the patients were categorized as cases (APAIS score ≥ 13) and controls (APAIS score < 13). Sociodemographic characteristics, clinical features, and fears associated with anesthesia and surgery were also noted. **Results:** Out of the 399 patients recruited, 58.1% experienced significant preoperative anxiety. The fear of needles ($P = 0.002$), fear of waking up during the surgery ($P < 0.001$), and the patient's need of additional information regarding anesthesia and surgery ($P < 0.001$) were significantly associated with preoperative anxiety. **Conclusion:** A significant proportion of patients scheduled for day care surgery have preoperative anxiety. A preanesthetic workup of a patient with adequate clarification about their doubts and fears related to anesthesia and surgery is recommended to bring down the level of anxiety.

Key words: Anxiety, risk factors, day care surgery, preoperative


Key messages: (1) Preoperative anxiety does exist in a significant proportion of patients scheduled for day care surgery. (2) The factors significantly associated with preoperative anxiety were fear of injection or needles, fear of waking up during the surgery, and the patient's need for additional preoperative information regarding anesthesia and surgery. (3) A preanesthetic workup of a patient with adequate clarification about their doubts and fears related to anesthesia and surgery is recommended to bring down the level of anxiety.

Day care surgery has witnessed an exponential increase both globally and in India over the past few years.^[1,2] Numerous patients, with multiple comorbidities,

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previously deemed unfit for day care surgery, are now undergoing day care surgical procedures. The advantages of day care surgery include shorter hospitalization times, shorter waiting time, decreased risk of infections, early mobilization, lower costs, and reduced bed occupancy. The other presumed advantages include less stress for the patients due to avoidance of prolonged hospital stay and decreased time of separation from the family and home environment.

Day care surgery seems to be an attractive option for many patients, but recent studies have shown that preoperative anxiety is observed more frequently in day care patients when compared with in-patients undergoing fast-track surgery.^[3] Some authors recommend that anxious patients and those who wish strongly for inpatient treatment should be excluded from day care surgical procedures.^[3,4] Wetsch *et al.* have reported that day care surgery also has additional stress and that all patients may not be fit for shortened hospitalization.^[3]

Preoperative anxiety is a real concern for many patients undergoing anesthesia and surgery.^[5,6] Literature reports that 60%–92% of patients experience significant preoperative anxiety.^[6] Autonomic response associated with increased anxiety may cause tachycardia, hypertension, and arrhythmias and increase the risk of intraoperative hypothermia.^[6] Preoperative patient anxiety in the day care setup is especially relevant as sedative premedication is often omitted. Other factors contributing to patient stress and anxiety may include time pressures associated with the surgery in 1 day's time, waiting time in the ward prior to surgery, interaction with the hospital staff (nurses, anesthetists), and arranging an accompanying person and monetary resources. In addition, patients may have fears regarding anesthesia, surgery, and adverse events in the recovery period. There is a dearth of data from India in this field. Therefore, this study attempted to examine the prevalence and factors associated with preoperative anxiety in patients undergoing day care surgical procedures.

METHODOLOGY

Design

This was a cross-sectional study to evaluate the prevalence of anxiety in patients posted for day care surgery. However, a case-control framework was used to assess the factors associated with preoperative anxiety.

Setting

The study was conducted in a medical college with tertiary and specialist surgical departments.

Sample

Consecutive patients posted for day care surgery were recruited for the study after obtaining informed written consent. The inclusion criteria were as follows: (i) adults within the age group of 18–70 years, (ii) with or without a history of previous surgery, and (iii) American Society of Anaesthesiologists (ASA) Class 1–2, scheduled for elective surgery.

The exclusion criteria were as follows: (i) patients with a known history of anxiety or depressive disorders, (ii) people with mental retardation or with difficulties in speech and hearing, resulting in impaired communication, and (iii) patients who had taken an anxiolytic medication within 24 h prior to surgery.

Assessments

The following instruments were used to evaluate the patients:

- (i) *Amsterdam Preoperative Anxiety and Information Scale (APAIS)*^[7]: The scale has been specifically developed to evaluate preoperative anxiety. It is a six-item questionnaire with a 5-point Likert scale for each item. It has been validated against standard measures of anxiety. It has good psychometric properties. The instrument has been translated into many languages and has been validated for use across countries. In this study, we used its English version. Patients with an anxiety score of ≥ 13 on the scale are considered to have clinically significant preoperative anxiety
- (ii) A specially designed proforma to collect sociodemographic characteristics, clinical details, information regarding proposed surgery, and previously known factors associated with preoperative anxiety.

Since the APAIS questionnaire did not distinguish well between the fear of anesthesia and fear of surgery, a list of some selected variables from previous studies that were associated with preoperative anxiety was included in the proforma.

Procedure

Patients who presented to the ward for day care surgery were invited to take part in the study. Details of the study were explained, and written consent was obtained. The APAIS was administered on the day prior to the surgery and repeated on the morning of the surgery. Details of the time taken from admission to the day care ward to the induction of anesthesia and waiting time were also documented.

Statistics

The recommended APAIS threshold of ≥ 13 was used to divide the sample into cases with preoperative

anxiety; patients who scored <13 were not anxious and consequently considered controls. The mean and standard deviation were used to describe continuous variables, while frequency distributions were obtained for categorical data. The Chi-squared test and Student's *t*-test were used to assess the significance of bivariate associations for the categorical and continuous variables, respectively. Variables that were significant on bivariate statistical tests were entered into multiple logistic regression analysis. Odds ratio and 95% confidence interval were calculated. SPSS version 16 was used to analyze the data.

The sample size was calculated using the Epi Info program using the following assumptions:

(i) For the prevalence component, with a precision of 5%, confidence interval of 95%, and a 25% prevalence,^[8] the sample size calculated was 323. (ii) For the factors associated with preoperative anxiety component, assuming exposure among cases being 25% and among controls being 10%, power of study 80%, and error of 5%, the sample size required was 224, with 112 cases and 112 controls.

Ethics

Approval was obtained for the research protocol from the Institutional Review Board (IRB Min. No. 10909) of Christian Medical College, Vellore, prior to the recruitment of patients.

RESULTS

A total of 399 people were recruited for the study. The sociodemographic and clinical characteristics of the total study population are documented in Tables 1 and 2, respectively. The majority were middle-aged men (72.2%), literate (86.5%), married (79.2%), with a previous history of surgery (59.4%) and without health

insurance (97.2%), coming from places which are outside Tamil Nadu (65.2%), and undergoing procedures under general anesthesia (58.6%). Different types of day care surgeries were included under a broad heading of general surgery, orthopedics, ear–nose–throat, urology, and epidural steroid injections.

The majority of patients who were found to be anxious gave history of surgery in the past (56%). They were from other states outside Tamil Nadu (56.5%) and were scheduled for only general anesthesia (56%). The anxiety score taken a day before the surgery (APAIS A1) for cases and controls was 14.22 ± 2.25 and 11.23 ± 2.81, respectively, which was significant (*P* < 0.001). Similarly, the anxiety score taken on the day of surgery (APAIS A2) for cases and controls was 16.09 ± 1.89 and 10.60 ± 2.73, respectively, with *P* < 0.001.

The factors significantly associated with preoperative anxiety were patient's fear of needles/injections (*P* = 0.002), fear of waking up during the surgery (*P* < 0.001), and the need for additional information regarding anesthesia and surgery, which is generally given during the preanesthetic clearance for surgery (*P* < 0.001). Multiple logistic regression analysis showed that factors associated with preoperative anxiety remained statistically significant (*P* < 0.05) [Table 3].

DISCUSSION

This study attempted to examine the prevalence and factors associated with preoperative anxiety. Its strengths included the fact that it recruited consecutive patients, had a large sample size, used a standard instrument to evaluate anxiety, and used multivariate statistics.

The prevalence of preoperative anxiety in our study, using the APAIS, was 58.1%. Studies from different

Table 1: Sociodemographic details of cases and controls

| Characteristics | Total n=399 | Cases n=232 | Controls n=167 |
|--|-------------|-------------|----------------|
| Age (in years) ^a | 38.75±11.44 | 37.74±11.15 | 40.14±11.72 |
| BMI ^a | 24.94±3.78 | 25.04±3.78 | 24.81±3.79 |
| Marital status - married ^b | 316 (79.2) | 181 (78) | 135 (80.8) |
| Gender - male ^b | 288 (72.2) | 165 (71.1) | 123 (73.7) |
| Education - literate ^b | 345 (86.5) | 198 (85.3) | 147 (88.0) |
| ASA class of patients - 1 ^b | 291 (72.9) | 177 (76.3) | 114 (68.3) |
| Previous surgical experience ^b | 237 (59.4) | 130 (56) | 107 (64.1) |
| Without health insurance ^b | 388 (97.2) | 229 (98.7) | 159 (95.2) |
| Type of house - thatched ^b | 313 (78.4) | 187 (80.6) | 126 (75.4) |
| Monthly income ^c | 5000-10000 | 5000-10000 | 8000-15000 |
| Residence (within Tamil Nadu) ^b | 139 (34.8) | 81 (34.9) | 58 (34.7) |
| Residence (outside Tamil Nadu but within India) ^b | 231 (57.9) | 131 (56.5) | 100 (59.9) |
| Residence (outside India) ^b | 29 (7.3) | 20 (8.6) | 9 (5.4) |

BMI – Body mass index; ASA – American Society of Anaesthesiologists. ^aMean±standard deviation; ^bFrequency (%); ^cMedian, interquartile range

Table 2: Clinical profile of the cases and controls

| Clinical variables | Total n=399 | Cases n=232 | Controls n=167 |
|--|-------------|-------------|----------------|
| APAIS-A1 (anxiety on reporting to day care ward a day before surgery) ^a | 12.9±2.90 | 14.22±2.25 | 11.23±2.81 |
| APAIS-A2 (anxiety on the day of surgery) ^a | 13.8±3.54 | 16.09±1.89 | 10.60±2.73 |
| APAIS-N1 (needs more information on reporting a day before surgery) ^a | 6.90±1.63 | 7.31±1.34 | 6.32±1.81 |
| APAIS-N2 (needs information on day of surgery) ^a | 7.17±1.72 | 8.16±1.02 | 5.79±1.55 |
| General surgery | 152 (38.1) | 86 (36.1) | 66 (39.5) |
| Orthopedic surgery | 118 (29.6) | 67 (28.9) | 51 (30.5) |
| ENT surgery | 37 (9.3) | 22 (9.5) | 15 (9) |
| Urological surgery | 69 (17.3) | 45 (19.4) | 24 (14.4) |
| Epidural steroid injections | 23 (5.8) | 12 (5.2) | 11 (6.6) |
| Fear of needles ^b | 60 (15) | 46 (19.8) | 14 (8.4) |
| Fear of waking up during the surgery ^b | 83 (20.8) | 77 (33.2) | 6 (3.6) |
| Fear of pain ^b | 354 (88.7) | 206 (88.8) | 148 (88.6) |
| Fear of bleeding ^b | 22 (5.5) | 17 (7.3) | 5 (3) |
| Fear of disability ^b | 3 (0.8) | 3 (1.3) | 0 |
| Fear of nil per oral status ^b | 1 (0.3) | 1 (0.4) | 0 |
| Duration of surgery ≤1 h ^b | 265 (66.4) | 145 (62.5) | 120 (71.9) |
| Type of anesthesia ^b | | | |
| GA | 234 (58.6) | 130 (56) | 104 (62.3) |
| Neuraxial block | 131 (32.8) | 86 (37.1) | 45 (26.9) |
| Local anesthesia | 34 (8.5) | 16 (6.9) | 18 (10.8) |
| Waiting time (h) ^c | 1.35, 0.3-3 | 1.5, 0.45-3 | 1.3, 0.2-2.35 |
| Total PACU time (from PACU time to discharge from day care), h ^a | 6.04±1.85 | 6.01±1.79 | 6.09±1.94 |

APAIS – Amsterdam Preoperative Anxiety and Information Scale; GA – General Anesthesia; PACU – Postanesthesia care unit. ^aMean±standard deviation; ^bFrequency (%); ^cMedian, interquartile range

Table 3: Multiple logistic regression analysis showing factors associated with preoperative anxiety

| Variables | Odds ratio | 95% CI | P |
|--------------------------------------|------------|-----------|--------|
| Fear of needles | 3.11 | 1.12-8.65 | 0.029 |
| Fear of waking up during the surgery | 6.03 | 2.02-18.0 | <0.001 |
| APAIS (N2) | 5.89 | 4.13-8.38 | <0.001 |

CI – Confidence interval; APAIS N2 – Amsterdam Preoperative Anxiety and Information Scale (need for information score). Factors such as age, gender, marital status, economic status, h/o previous surgery, health insurance, duration of surgery, fear of postop pain, disability, and NPO status were not significant

parts of the world have reported varying prevalence rates, from 23.4% to 76%. A Sri Lankan study reported a prevalence of preoperative anxiety of 23.4%,^[8] whereas a Mexican study showed a much higher prevalence of 76%.^[9]

A study reported 42.2% prevalence and concluded that the preoperative anxiety is a multifactorial issue which needs reduction strategies.^[10] Lichtor *et al.* showed the prevalence of preoperative anxiety as 59% and stated that anxiety seen at the preoperative holding bay could be predicted from the anxiety seen in the afternoon before the surgery.^[11] Our study found this similar association between the anxiety score on the day of surgery and anxiety score taken a day before the surgery, where both the values were not very different from each other. Gangadharan *et al.* reported a 60% prevalence, with the important associated factors being age, gender, marital status, previous surgical experience,

and different types of surgeries.^[12] Wetsch *et al.* reported 38.3% prevalence of preoperative anxiety in day care surgery patients.^[3]

More than half of the patients admitted to day care surgery wards are anxious. This finding is of significance because according to standard day care anesthesia protocols, generally, premedication is usually avoided and therefore, such patients are likely to have more preoperative anxiety. The awareness about the prevalence also points out toward the scope of further research to find out the means to allay the anxiety.

Many factors associated with preoperative anxiety have been mentioned in the literature, namely, gender, marital status, fear of complications, apprehensions, previous surgical experience, socioeconomic status, postoperative pain, type of anesthesia, lack of preoperative information, cigarette and alcohol usage, education, and occupation.^[10,13] We have taken selected variables to examine their association with preoperative anxiety. The majority of patients who were anxious gave a history of previous experience of surgery in our study, but this finding varied from other study.^[14] This may be attributed to the previous unpleasant experience they would have had, or related to surgery or anesthesia. While some studies reported that anxiety is more common in women, we found that males had more anxiety than females.^[7,14]

We found a close association between anxiety and the need for additional information. As in the APAIS study, patients who had a high anxiety score were the ones who needed additional or more information than the patients who had low anxiety score.^[7,14,15] This finding may strengthen the recommendation for a good preoperative workup of patients before surgery, where additional information can be provided and problems can be addressed. Fear of complications during surgery has been reported to have an association with preoperative anxiety.^[13] Out of the selected variables that were studied, the fear of needles or injections and fear of waking up during the operation were found to be significant and commonly associated with the preoperative anxiety, in our day care population.

During the preanesthetic check-up, information regarding the type of anesthesia is generally explained to all patients by the examining anesthesiologist. But, due to time constraints, complexity of the disease process, or language barrier, there might be a deficiency in the explanation of the related information of anesthetics and surgery. In some studies, it has been found that the patients who received better preanesthetic information showed low scores on the anxiety scale when compared with those who did not receive any explanation.^[16] However, an association was found in our study where the anxious patient had a higher need for additional information. Our study did not show any significant association between the level of anxiety and educational status or occupational status.

Other factors such as age, sex, socioeconomic status, marital status, body mass index, previous experience of surgery, presence or absence of health insurance, duration of waiting period prior to administration of anesthesia, type of anesthesia, and residential status were not significantly associated with preoperative anxiety. In our institutional practice, the surgical waiting period ranges from 2 to 3 months; hence, patients may not mind waiting for 6 h preoperatively on the day of surgery. Therefore, this did not have an association with anxiety in our patients, unlike some study where prolonged waiting time was shown to cause distress among patients.^[17] But even then, support strategies are recommended by the authors, to be implemented by the nursing staff during the waiting period in day care centres to reduce anxiety. There was no significant difference found in relation to the type of anesthesia, but patients who were planned for general anesthesia were more anxious than the ones who were planned for regional or local anesthesia, which was similar to the results of a recently published study.^[18] This may point toward a limited knowledge about the types of anesthesia available, the risks associated with each, and previous surgical experience. This can also help us in

planning future studies to assess the awareness about anesthesia among patients and thereby improving the quality of care. Incidentally, we also found that patients who were anxious belonged mainly from states outside Tamil Nadu, even though this did not reach statistical significance. This might imply that most of the patients who come from far off places need more flexibility in their treatment plans and facilities to reduce their anxiety.

There have been some limitations to our study. The pediatric and geriatric populations have been excluded from the study, even though they constitute a good number in the daycare surgery patient pool. Different types of surgeries were included in the study and they were not divided according to their duration and nature.

CONCLUSION

A considerable number of patients scheduled for day care surgery were found to have a significant amount of preoperative anxiety. In our study, the factors associated with preoperative anxiety that were significant were the fear of injections or needles, fear of waking up during the surgery, and the need for additional information that the patients require regarding anesthesia and surgery. Hence, a good preanesthetic workup of patients, with adequate clarification about their doubts and fears related to anesthesia and surgery, is recommended to bring down the level of anxiety.

Amsterdam preoperative anxiety and information scale (APAIS)

1. I am worried about the anesthetic
2. The anesthetic is on my mind continually
3. The procedure is on my mind continually
4. I am worried about the procedure
5. I would like to know as much as possible about the anesthetic
6. I would like to know as much as possible about the procedure.

(The measure of agreement with these statements should be graded on a 5-point Likert scale from 1 = *not at all* to 5 = *extremely*).

The anxiety scale (APAIS A) consists of four items (questions 1, 2, 3, 4), each of which could be scored from 1 to 5. The score of the anxiety scale is the sum of these four questions, with a scoring range from 4 to 20. The cut-off score is 13. Score ≥ 13 defines significant anxiety, whereas < 13 defines mild anxiety.

The need-for-information scale (APAIS N) consists of two items (questions 5 and 6), each of which could be scored from 1 to 5. The sum of the need-for-information

scale is the sum of these two questions, with a scoring range from 2 to 10. Cut-off being 5. Score ≤ 5 needs no excessive information, whereas score > 5 needs more information than the legal explanation about the procedure.

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Conflicts of interest

There are no conflicts of interest.

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