

Preoperative Anxiety Assessment in Adult Patients Undergoing Elective Surgeries: A Cross-Sectional Observational Study

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ABSTRACT

Introduction

Anxiety is the subjective unpleasant feeling of dread over something unlikely to happen. The incidence of preoperative anxiety ranges from 32% to 76.7%. We aimed to measure the preoperative anxiety level using Amsterdam Preoperative Anxiety and Information Scale questionnaire and clinical rating scale given by attending anesthesiologist / anesthesia residents.

Methods

It was cross-sectional observational study conducted in wards. We enrolled 110 adult patients planned for elective gynecological and gastrointestinal surgeries. After taking informed written consent, principal investigator interviewed the patient, one day prior to surgery in wards using a structured questionnaire of Amsterdam Preoperative Anxiety and Information Scale. Demographics characters were recorded. The attending anesthesia residents (blinded to patient response) performed preanesthetic assessment, provided their subjective rating about patient anxiety and need for information using Clinical Rating Scale.

Results

Out of 110 patient, 57(51.81%) were found to have higher anxiety level. Comparing the APAIS score with various factors, we found younger age, female gender, unemployed status, higher level of education, adverse events in previous surgery and higher grade of surgery was associated with higher anxiety score. Comparing APAIS with Clinical Rating Score, there was poor correlation.

Conclusion

The incidence of preoperative anxiety is high (51.81%) in adult patients undergoing elective surgery. During the preoperative anesthetic checkup, APAIS can be used as a screening tool. It provides relevant information on the presence of preoperative anxiety and need for information, which helps to achieve patient satisfaction and better outcome.

Keywords

Amsterdam preoperative anxiety and information scale (APAIS), anxiety, clinical rating score, need for information, preoperative anxiety

INTRODUCTION

Preoperative period is anxiety provoking and is difficult to measure accurately.¹ Even though it influences the results of surgery and anesthesia, it is not assessed systematically because of time restrictions during the preoperative visit, workload of anesthesiologist or because patient concerns are underestimated. Questionnaires are suitable tools to ask patients about feelings of fear or somatic and cognitive symptoms associated with anxiety. Several validated questionnaires quantify anxiety.² These include Spielberger's State Trait Anxiety Inventory (STAI),³ Amsterdam Preoperative Anxiety Information Scale (APAIS),⁴ Hospital Anxiety and Depression Scale (HADS),⁵ Multiple Affect Adjective Check List (MAACL), Visual Analogue Scale for Anxiety (VAS-A). Among them APAIS provides a specific qualitative questionnaire for evaluation of preoperative anxiety. It is a timesaving economical instrument. It is a widely accepted screening tool, translated and used in many countries including Germany,⁶ the Netherlands,⁴ Japan,⁷ and Sri Lanka.²

We aimed to measure the preoperative anxiety level using APAIS questionnaire and clinical rating given by attending anesthesiologist/anesthesia residents.

METHODS

It was a cross-sectional observational study done for one-year period and was in accordance with the principles of declaration of Helsinki. Eighteen to 65 years patients scheduled for elective gastrointestinal and gynecological surgeries were included. We excluded patient not willing to participate in the study, with documented psychiatric diseases/ mental retardation, under treatment with anti-anxiety agents and/or antidepressants, language disorder/ problem preventing effective communication.

After getting ethical approval from the Department of Anesthesiology and Institutional Review Committee of the institute, informed written consent taken from patient in wards one day prior to surgery. We recorded demographics characters. Patients were interviewed by the principal investigator using a structured questionnaire of APAIS [Table 1] The attending anesthesiologist or second/third year anesthesia residents (blinded to patient response

to APAIS) did subjective rating about patient anxiety and need for information using CRS.

Four items (Item 1, 2, 4 and 5; Cronbach's $\alpha=0.86$) are preoperative anxiety scale and two items (Items 3 and 6; Cronbach's $\alpha=0.72$) are the need for information scale, [Table 1].⁶ The closer the Cronbach's α coefficient is to 1.0, the greater the internal consistency of the items in the scale. Reliability is considered acceptable when Cronbach's α is 0.70. The APAIS correlates with the State-Anxiety-Scale (STAI) with $r=0.74$ [15], $r=0.67$ ⁷ as well as $r=0.64$ ⁸ which is a good indicator for its validity, where r is the correlation coefficient.

Patients judge their agreement with each statement on a 5-point Likert scale from 'not at all' (one point) to 'extremely' (five points). Sum scores range from 4.0 to 20 for the anxiety scale [4.0 (not anxious) to 20 (highly anxious)] and from two to ten for the need for information scale. Based on the component of APAIS scores⁴: anxiety about anesthesia (SUM A) is sum of APAIS1 and APAIS2; anxiety about surgery (SUM S) is sum of APAIS4 and APAIS5; total anxiety (SUM C) is SUM A+SUM S; need for information (SUM I) is sum of APAIS3 and APAIS6. Interpretation of SUM C: Total anxiety score of <11 is Minimal (No Anxiety), Total anxiety score ≥ 11 is High Anxiety. Need for information (SUM I): scores from 2.0 to 5.0 is little (No Information requirement), scores >5.0 is More (High Information requirement). In Clinical Rating Scale (CRS), assessment of patient's anxiety and need for information is done by using an adapted version of the APAIS4 with some modifications in wording i.e. 'I am worried about the procedure' to 'the patient is worried about the procedure'. The rating scale is the same as in the patient version. Based on the component of CRS scores, anxiety about anesthesia (SUM CA) is sum of CRS1 and CRS2; anxiety about surgery (SUM CS) is sum of CRS4 and CRS5; total anxiety (SUM CC) is SUM A+SUM C; need for information (SUM CI) is sum of CRS3 and CRS6.

Collected data analyzed by using IBM SPSS software version 20. Values were presented as mean (standard deviation SD or range) or number. APAIS and CRS score were calculated. Predictors of more anxiety and/or need for information underwent univariate analysis to see relation to the anxiety level. Agreement between patients and physicians'

Table 1. Amsterdam preoperative anxiety and information scale (APAIS)

SN	Item	Code	Corresponding scale
1	I am worried about the anesthetic	APAIS1	Anxiety
2	The anesthetic is on my mind continually	APAIS2	Anxiety
3	I would like to know as much as possible about the anesthetic	APAIS3	Need for information
4	I am worried about the procedure	APAIS4	Anxiety
5	The procedure is on my mind continually	APAIS5	Anxiety
6	I would like to know as much as possible about the procedure	APAIS6	Need for information

ratings calculated using the Kappa coefficient. p-value <0.05 was considered significant.

Considering CI of 95%, precision of 90%, planned proportion of 50% and using sample size formula $N = z^2 p(1-p)/d^2$ [Where, $z = 1.96$ (CI of 95%; $\alpha = 0.05$), $p = 50\% = 0.5$, $d = 10\% = 0.1$] calculated sample size was 96.04. Taking loss rate of 10%, sample size was 106. Final sample size was 110.

RESULTS

Hundred and ten patients were enrolled [women 72 (65.45%) vs men 38 (34.54%), p value 0.805]. Sixty-seven (60.9%) patients were ASAPS I, 38(35.6%) were ASAPS II and five (4.5%) were ASAPS III. Seventy-five had gastrointestinal and 35 had gynecological surgeries. Eleven had previous surgery with six patients giving history of adverse events like post-dural puncture headache, wound infection and incisional hernia. Only 14(12.72%) cases done under regional anesthesia and remaining cases conducted under general anesthesia.

Among them, 57 (51.81%) patients were anxious but 53 (48.18%) patients were not. The minimum anxiety score was 5.0, maximum was 14 and mean was 9.85 ± 2.12 . Mean SUMA was 4.53 ± 1.20 and SUMS was 5.33 ± 1.36 with P value <0.001 showing lesser anesthetic anxiety than surgical anxiety. Mean of need for information regarding anesthesia (AP AIS3) was 2.44 ± 0.89 and for surgery (AP AIS6) was 3.0 ± 0.91 with p value <0.001. It shows the need for information regarding the anesthesia was lower compare to surgery.

Majority of non-anxious case (34 out of 53) had less need for information. Likewise, 33 out of 57 of the anxious case had higher need for information. There was a good correlation (0.317) between need for information and anxiety [Table 1]. Mean anxiety score in male vs female (8.76 vs 10.43), p value <0.001. Anxiety score was significantly higher in younger age, female, unmarried, unemployed, higher educational status and in major surgeries. [Table 2] In our study 37(59.68%) in high educational status group were anxious whereas among illiterate only 2.0 (25%) were anxious. This showed that high educational status was associated with increased incidence of anxiety [Table 2]. Prevalence of anxiety among unemployed patient was high 13(61.9%) but in employed it was just 44 (49.4%) [Table 2].

Prevalence of anxiety was similar in ASA PS I and II where as in ASA PS III patient prevalence was highest. The p value between ASA PS I and II was 0.66, between ASA PS II, III was 0.52 and ASA PS I, and III was 0.63, which suggested no statistical significance. Among 11 patients with previous surgery, seven (63.63%) were anxious. In-patient with adverse event in previous surgery, four were anxious among the six patients (66.66%).

Table 2. Relationship between need for Information and anxiety

SUM C	SUM I		r-value	p-value
	Less need	High need		
<11 (No anxiety)	34 (64%)	19 (36%)	0.32	0.001
≥11 (High anxiety)	24 (43%)	33 (57%)		

Table 3. Prevalence of anxiety based upon various patient characteristics

Characteristics	≥11 (High anxiety)	<11 (No or minimal anxiety)
Age		
<30yrs	13(61.9%)	8(38.1%)
>30 yrs	44(44.44%)	45(45.45%)
Gender		
Female (SUMC)	46(63.8%)	26(36.2%)
Male (SUMC)	11(28.94%)	27(72.16%)
Marital status		
Married	46(50%)	46(50%)
Unmarried	11(61.11%)	7(38.88%)
Employment status		
Employed	44(44.44%)	45(45.45%)
Unemployed	13(76.47%)	4(23.52%)
Educational status		
Higher	37(59.67%)	25(40.32%)
Intermediate	18(45%)	22(55%)
Illiterate	2 (25%)	6(75%)
Surgery		
Minor surgeries	5(38.46%)	8(61.53%)
Intermediate surgeries	30(47.61%)	33(52.38%)
Major surgeries	22(64.70%)	12(35.29%)

Table 4. Correlation between patients' and clinicians' rating of anesthesia related anxiety

Anxiety	N	Mean	SD	r	p-value
SUMA	110	4.53	1.21	0.39	<0.001
SUMCA	110	4.27	1.34		

Table 5. Correlation between APAIS and CRS in regard to need for information

Need for information	N	Mean	SD	r	p-value
SUMI	110	5.44	1.27	0.21	0.03
SUMCI	110	5.16	2.32		

Mean anxiety score in ASA PS I vs II vs III was 9.90- vs 9.71 vs 10.40. SUM C < 11 in ASA PS I vs II vs III was 32 (52.24%) vs 20 (52.64%) vs 1 (20%) whereas SUM C ≥ 11 in ASA PS I vs II vs III was 35 (47.76%) vs 18 (47.36%) vs 4 (80%). Prevalence of anxiety among patient undergoing minor procedure was 27.77% while on those undergoing major procedures was 64.57% (p value = 0.04).

Among planned GA, 52 % (50 of 96) were anxious while on planned SAB 7 (50%) out of 14 were anxious. Mean SUM C (anxiety level based on type of Anesthesia) in GA vs SAB (9.92 ± 2.071 vs 9.43 ± 2.503, p value 0.424) showing no statistically significant difference on anxiety level based on type of anesthesia. A comparison of the mean anxiety levels of self-evaluation and physicians' rating revealed a small difference between both groups. The mean anxiety score of APAIS was 9.85 and the mean anxiety score obtained from CRS was 9.98. The agreement between self-report and clinician rating was calculated as correlation coefficients. In our study r for APAIS Anesthesia, anxiety scale was found to be 0.39 (p < 0.001) which shows good correlation though clinical rating was lesser than the patients' self-rating [Table 4].

A comparison of the need for information levels of self-evaluation and physicians' rating revealed a difference between both groups. The agreement in term of need for information was calculated between self-report and clinician rating as correlation coefficients. In our study correlation coefficient (r) for APAIS and CRS need for information was found to be 0.21 (p = 0.03) [Table 5].

DISCUSSION

Patients experience anxiety about surgery and anesthesia. However, the individual need for information may not correlate with the degree of preoperative anxiety. This study demonstrates that perioperative anxiety is common in patients undergoing elective surgery. Using the APAIS, a short, reliable and valid tool, physicians can assess patients' anxiety and need for information in a preoperative anesthetic assessment.

In our study, mean age was 42.55 ± 12.31 years, which shows normal distribution of the sample. Number of female patients was more (64.54%), because of enrollment of gynecological cases. In our study, 51.81% of the patients exceeded APAIS score as defined by Moerman et al.,⁴ and considered as 'anxiety cases'. This prevalence is higher than in studies done in developed countries, which is from 18.9%⁹ to 32%.⁴ The prevalence documented in patients awaiting coronary artery bypass graft surgery (CABG) was as high as up to 50%. Comparing the prevalence of anxiety level of patient with that of other developing countries, the

prevalence is lesser in our study than in Sri Lankan patients, which was 76.7%.² Many factors attributed to a relatively higher prevalence in our patients. Due to social barrier and respect for the doctors, usually patient does not raise any doubts. Concerns over surgery and anesthesia are generally masked. In addition, there are not any forums and patient-based support groups for discussing the issues related to their anxiety.² Based on the results, we found a fair reliability of the APAIS questionnaire as the internal consistency determined by Cronbach's alpha, for anxiety scale.

Patients reported more concerns related to surgery than anesthesia, similar result noted by many other authors.^{9,10} Different factors, such as violation of physical integrity, fear of extension of the planned procedure, outcome of surgery (functional disability), better imagination of surgical strategies in comparison with anesthetic techniques and others may lead to this perception.⁹ The mean score for need for information was 5.44 (Anesthesia: 2.44 and Surgery: 3) which suggest less need for information regarding anesthesia and high need for information regarding surgery. 80.9% of patient had less need for detailed anesthetic information, which is similar to study done by Pokhrel K et al.¹⁰ The patient who wanted more information was also more anxious (33 out of 57) which is also noted in study by Pokhrel K et al.¹⁰ Our study found a high positive correlation between highly informed seekers and anxiety scores. Apinya et al speculated that there might not be a relationship between information requirement and anxiety scores in patients in developing countries. The clinical implication of this finding is that high information seekers needed more information to reduce anxiety. Study done by Moerman et al also suggested same finding.^{2,4,11} The factors which affected anxiety levels in patients, varied in studies done in different countries. The epidemiology of preoperative anxiety in this study showed some differences and some similarities to previous studies. Recent studies have shown that there is no statistically significant relationship between APAIS anxiety scores and sex, age, type of operation and previous experience of surgery.^{6,7} In our study, it was found that women were more anxious than men were, which was also seen by Laufenberg et al. (9.1 vs. 6.9; P < 0.005).⁹ Similar findings were noted by other studies^{2,4,10,12} as well, which is correlated with their fluctuating level of estrogens and progesterone as noted by Weinstock LS.¹³

The education level has been associated with higher level of anxiety by various studies.^{2,4,9,10} In this study, the prevalence of anxiety was 59.68% in high educational status, which is higher than in illiterate patient (25%). In our study, unmarried patient were more anxious which may also be due to younger age.

As expected, there was a positive correlation between extent of surgery and the patients' anxiety. Prevalence of anxiety among patient undergoing minor procedure was 27.77% while on those undergoing major procedures was 64.57% ($p=0.04$). Rita et al.⁹ also noted that patient with high anxiety level were scheduled to undergo higher grades of surgery. There was similar level of anxiety among ASA PS I and II patient while it increased highly in case of ASA PS III but the result was not statistically significant.

There was no correlation between previous surgery and anxiety. Berth et al noted similar finding.⁶ When further analyzed the patient with previous surgery with complication associated with surgeries, we found higher level of anxiety. Among six such patients, four were anxious (prevalence of anxiety was 66.67%).

There was no relation between type of anesthesia planned and level of anxiety. Similar findings noted on other studies as well.^{6,9}

In this study, the anxiety scale scores revealed an overestimation of patients' anxiety by the physicians (9.85 Vs 9.98) and underestimation for the need of information (5.44 vs. 5.16). This finding is similar to Shafer et al. 1. Similar findings was noted by Rita et al where they document that physicians attributed greater importance to the patients' anxiety than the patient themselves, while they had a tendency to underestimate the patients' need for information.⁹ A possible reason, which is in accordance with results from other studies,^{1,14} may be that physicians focus their attention more on the patient's physical condition and tend to overlook the importance of psychological factors.⁹

Few limitations of our study were study included only patients undergoing gastrointestinal and gynecological procedures. Hence, the results of this study cannot extend to all patients undergoing elective surgeries. Our study did not evaluate the inter rate reliability of the clinical anxiety score, among anesthesia residents. Anxiety score were determined one day prior to surgery. As stated by Pokharel K. et al., frequency of anxious patients is variable at different time points before surgery, highest being at preoperative holding area.¹⁰

CONCLUSION

Incidence of preoperative anxiety is high (51.81%) in adult patients undergoing elective surgeries. APAIS can be use as a screening tool during the preoperative anesthetic checkup. It provides relevant information on the presence of preoperative anxiety and need for information, which helps to achieve patient satisfaction and better outcome.

CONFLICT OF INTEREST

None declared.

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