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Frequency of preoperative anxiety in Pakistani surgical patients

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Original Article

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Abstract

Objective: To measure the frequency of preoperative anxiety in patients coming to our hospital and to correlate Visual analogue scale (VAS) with State Trait Anxiety Inventory (STAI) questionnaire.

Methods: This cross sectional study included 300 ASA I and II adult surgical in-patients admitted over a period of one year. STAI questionnaire and VAS was used as study tools. STAI score of > 44 or VAS score of $\geq$ 50 were considered as significant anxiety. Enrolled patients were visited by primary investigator the day before surgery and patients were asked to fill the STAI questionnaire and VAS score.

Results: Significant preoperative anxiety was seen in 62 % patients (73% females and 42% males). Frequency of anxiety decreased with advancing age but increased with higher educational status. A total of 77% of patients with no previous exposure to surgery and 26% of patients who had previous surgery, were anxious. Also 49% of patients who had visited the clinic and 86% of patients who had not visited the clinic were anxious. VAS correlated with STAI in 90% cases. Cut off value of VAS which showed positive correlation with STAI was 45.

Conclusion: Frequency of preoperative anxiety was 62%. Female gender, younger age and higher educational status were positively correlated while prior experience of surgery while preoperative anaesthesia clinic visit were negatively correlated with anxiety. VAS correlated well with STAI (JPMA 59:359; 2009).

Introduction

The assessment of anxiety is important in patients scheduled for surgery because anxious patients respond differently to anaesthesia than non anxious patients. Anxious patients require higher doses of induction agents and postoperative analgesic drug.[1-4] Literature suggests the incidence of preoperative anxiety as 60 to 80 % in western population.[5,6] The frequency of anxiety in Pakistani surgical patients is not known. Cultural differences may affect this figure.

There are several instruments for measuring anxiety. Objective estimates include indirect measurements of sympathetico-adrenal activity using heart rate and blood pressure, or skin conductance, while plasma cortisol and urinary catecholamines have been used as more direct measurements of this activity.[6,7] Subjective tools that can be used for anxiety assessment are STAI (State Trait Anxiety Inventory), HADS (Hospital Anxiety and Depression Scale), VAS (Visual Analogue Scale) and others.[8]

The current gold standard of anxiety measurement is Spielberger's State-Trait Anxiety Inventory (STAI).[9] STAI has two versions, one is for assessment of trait anxiety (T-STAI) and other is for assessment of state anxiety (S-STAI). Measurement of state anxiety is recommended in perioperative period. Visual analogue scale is an alternative scale which consists of 100 mm line.[10] One end of this line shows no anxiety while the other end illustrates the highest anxiety possible. Anaesthetists are familiar with this tool as it is also used in pain measurement.

Purpose of our study was to identify the frequency of anxiety in a group of Pakistani surgical patients presenting to our hospital using both State Version of State Trait Anxiety Inventory Scale (S-STAI) and Visual Analogue Scale (VAS) taking S-STAI as gold standard. The correlation of S-STAI with VAS was also noted.

Patients and Methods

After approval from hospital's ethical committee, this cross sectional study was conducted on the surgical wards of Aga Khan University Hospital Karachi. Duration of study was one year (from April 1st 2005 till April 30, 2006).

A total of 300 patients were enrolled by convenient sampling technique. Those included in the study were adult ASA I and II admitted patients (age between 16 - 80 years) undergoing various elective surgeries. Patients with known psychiatric illness, those on any type of anxiolytics and those who did not understand Urdu or English were excluded from the study. In addition, procedures like cardiothoracic surgery, major vascular surgery, surgery for malignancies and extensive bowel resection were also excluded.

The study tools used were the State version of State Trait Anxiety Inventory (S-STAI)[9] and Visual analogue scale.[10] S-STAI consists of 20 statements. Ten statements express anxiety while the remaining 10 statements represent the relaxed and pleasant state of patient if there is any. These statements are arranged randomly as described in the original

scale. In front of each statement there are four responses. Patients have to pick any one response for each statement. We used English version of STAI for patients who understood English and a translated Urdu version of STAI for those who did not understand the English questionnaire. A value of more than 44 on this scale was taken as significant anxiety.[8] The second scale used was Visual Analogue Scale for anxiety (VAS).10 It consists of a 100 mm straight line. Left side of this line is marked as "No anxiety "and "0" while extreme right of this line is marked as "maximum anxiety" and "100" .Patients were requested to assess their own anxiety and make a corresponding mark on the anxiety line accordingly.

A proforma with three parts was designed for the study. Part 1 contained demographic data including name, age, gender, medical record number, level of education, occupation, current surgery scheduled, information about any previous surgeries and whether the patient was seen in the preoperative clinic. Part 2 contained S-STAI scale and Part 3 contained VAS. Eligibility of patients for study was established by the primary investigator after reviewing the patients who were scheduled on next day operating room list. Recruited patients were then visited by primary investigator on the evening before surgery between 17:00 hrs and 21:00 hrs. After explaining the purpose of the study and instructions for filling STAI and VAS, written informed consent was obtained and demographic data was recorded by the primary investigator. Patients were then asked to fill the forms in the presence of primary investigator. A standardized time of 10 minutes was given to the patient to fill the proforma.

Frequency tables were generated for age, gender, occupation, level of education, type of surgery, exposure to past surgery and visit to preoperative clinic. In addition mean and standard deviation for age was calculated.

Two sided Chi square test was used to determine the statistical significance between anxiety and gender/age/preoperative clinic visit/past exposure to surgery/type of surgery/level of education. A p value of <0.05 was considered significant.

One way analysis of variance (ANOVA) was used to compare the combined effect of prior surgery and anaesthesia clinic visit on preoperative anxiety.

Correlation between STAI and VAS was calculated by applying Pearson test of correlation and linear regression graph.

Cut off value for VAS against STAI score of 44 was determined by obtaining coordinates from receiver operating characteristic curve (ROC curve). The value with highest possible specificity and sensitivity was then chosen.

Results

A total of 300 patients were enrolled in the study. Their mean age was 42±16 years (range 16 to 80 years). There were 108 (36%) males and 192 (64%) females. As regards level of education, 69 (23%) were Matriculate or less, 146 (48%) were intermediate and 85 (28.3%) were graduate or above.

Ninety one (30%) patients had undergone previous surgery while 209 (70 %) had no experience of previous surgery.

The preoperative anaesthesia clinic was visited by 197 (66%) patients for the present surgery. Distribution of patients according to occupation and, surgical specialty is given in Tables 1 and 2 respectively.

Table 1: Patient Distribution According to Occupation.

Occupation	Number	Percent
House wife	171	57.0%
Business	25	8.3%
Unemployed	42	14.0%
Teacher	4	1.3%
Private work	35	11.7%
Student	16	5.3%
Others	5	1.7%
Doctor	1	.3%
Labourer	1	.3%
Total	300	100.0%

Table 2: Patient Distribution According to Type of Surgery.

Surgery	Frequency	Percent	Cumulative Percent
General	40	13.3	13.3
Orthopaedic	40	13.3	26.7
Urology	30	10.0	36.7
Gynaecology	40	13.3	50.0
ENT	48	16.0	66.0
Neurosurgery	25	8.3	74.3
Obstetrics	77	25.7	100.0
Total	300	100.0	

Factors affecting anxiety levels:

Over all 186 (62 %) patients had significant preoperative anxiety (having S-STAI scores of 44 and above). Females were found to be more anxious than males with preoperative anxiety being present in 141 (73%) women compared to 45 (42%) males (p< 0.001).

Age was found to be a contributing factor in predicting preoperative anxiety levels. As age increased, the anxiety frequency decreased (p< 0.001).

Effect of occupation on preoperative anxiety levels were not analyzed because of uneven distribution of patients and gender in this subgroup.

There was significant correlation (p=0.005) between level of education and preoperative anxiety. Patients with educational level Matriculate or less, 33 (48%), had significant preoperative anxiety. This increased to 95 (65%) in the group

who had completed intermediate level of education. Highest frequency of anxiety was seen in 58 (68%) patients and it was more in postgraduates.

There was clinically and statistically significant correlation between anxiety and different types of surgery. However correlation between type of surgery and preoperative anxiety was not included in the results because of uneven distribution of female gender and housewife occupation in surgical subsets (which were independent risk factors for anxiety) which could have confounded the results.

Among those patients who had no experience of prior surgery, 162 (77%) had significant anxiety. Frequency of preoperative anxiety was only seen in 24 (26%) patients who had undergone at least one surgery in the past (p < 0.0001).

Patients who visited the preoperative clinic had a low frequency of anxiety. Only 97 (49%) patients out of those who had visited the clinic were anxious. On the other hand 89 (86%) patients who had not visited the clinic were anxious (p < 0.001).

Combined effect of previous surgery and preoperative clinic visit on anxiety was also analyzed. Patients who neither visited the clinic nor had past experience of surgery numbered 84 (92%), had preoperative anxiety. Whereas 5 (42%) patients who had previous surgery only (and not visited the clinic for present surgery) were anxious. Seventyeight (66%) patients who only visited the clinic group (but had no exposure to previous surgery) were anxious. On the contrary, only 19 (24%) patients who had both previous surgery and had visited the clinic for present surgery, had anxiety. Statistical analysis

Linear Regression Graph.
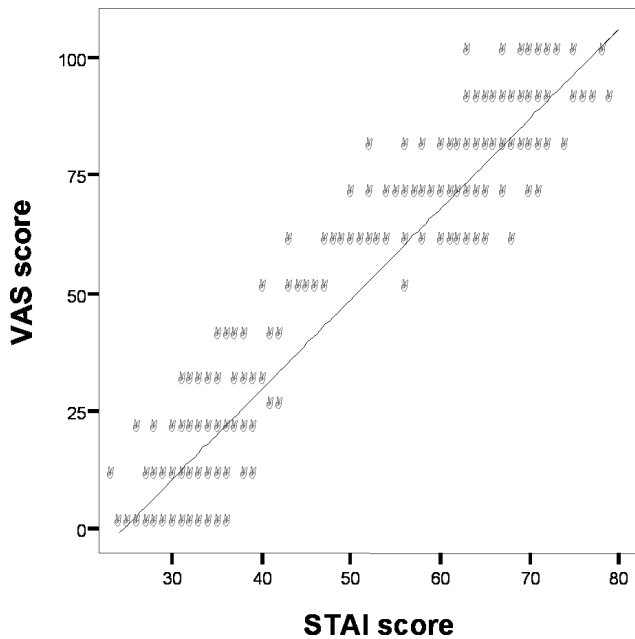
Graph: Correlation between VAS and STAI

between these four groups (one way ANOVA) showed that a combination of previous exposure to surgery and preoperative clinic visit for present surgery was more effective in determining low frequency of anxiety than when these were present individually (p < 0.01).

Comparison of STAI and VAS scales:

VAS was compared against STAI scale to see the correlation between two scales.

A linear association was observed between the two scales for 90% of readings. ($r2= 0.90$) (Graph). Cut off value of VAS which showed positive correlation with STAI score of 44 was found to be 45. Using VAS to measure anxiety with this cutoff value, frequency of anxious patients was 62%. This was similar to the results obtained by STAI questionnaire (frequency of anxiety with STAI was also 62%).

Discussion

Anxiety is a common response to stress and is present in patients scheduled for surgery. As with pain, assessment of presence of anxiety and quantifying is difficult. In the past, various investigators described different methods for quantifying anxiety. In broad terms these were either self reporting questionnaires[9-13] or objective tools which measured the activity of stress hormones.[6] All these methods have their limitations. Among the available tools, State Trait Anxiety Inventory questionnaire (STAI)[9] is currently taken as a gold standard because it has shown consistent results in different population and ethnic groups in assessing anxiety and is available in various languages. Major drawback is that it is cumbersome with a total of 20 questions, patient should be literate to understand and fill it, and it needs some explanation for the patient. Various other scales were developed and tested against STAI. One of the simple scale for use is Visual Analogue Scale (VAS) which consists of 100 millimeters straight line with 0 on its extreme left and 100 on the extreme right position.[10] This scale is simple and self explanatory and can easily be filled by any patient who is familiar with numericals. Literature suggests that it correlates well with STAI and can be used to determine anxiety.[8,10,13] Anaesthesiologists are also familiar with this scale because of its use in pain measurement.

Over all frequency of preoperative anxiety in our study was 62% as suggested by STAI score of more than 44. This result was similar to the previous studies done in western population.[5,6,8]

We also observed that females were more anxious than males. Some previous studies support this finding[1,10,14,15] while others found that gender was not a determinant of preoperative anxiety.[13,16]

Higher education was found to be related to higher anxiety levels. These observations are supported by Domer et

al[14] and Caumo[15] but not by other studies.[10,16] It is likely that patients with higher level of education were more aware of the complications related to surgery and anaesthesia. It was also observed in the prior studies that in educated patients, information seeking behaviour was more frequent and this in it self was associated with high level of anxiety.[1]

In our study, increasing age was associated with a decreased level of preoperative anxiety. Our results are similar to Kindler[10] and Iftikhar uddin[16] but different from Domer and colleagues[14] who did not find age as a determinant of preoperative anxiety.

Visit to the preoperative anaesthesia clinic was found to be helpful in reducing anxiety before surgery. This was consistent with some studies,[13,17] in contrast, one study found no correlation between visit to preoperative clinic and level of preoperative anxiety.[18] It is apparent that explanation and reassurance by anaesthesiologist in the preoperative clinic, might be beneficial to reduce anxiety and fear.

Another factor which was negatively correlated with anxiety was prior experience of surgery. Patient who had at least one prior surgery had low anxiety levels. This finding was also consistent with other studies reported by Moerman,[1] Kindler[10] and Caumo.[15] These results suggest that patients who had undergone another surgery earlier were less anxious because they had less "fear of unknown" or misconcepts about anaesthesia and surgery.[1]

We also observed that combination of factors (previous exposure to surgery and visit to the preoperative anaesthesia clinic visit for the present surgery) was more effective in reducing anxiety than when they were present individually.

Unfortunately, valid statistical analysis of association between anxiety and type of surgery and occupation was not possible in our study because of two reasons. First, all the patients in gynecological and obstetrical surgeries were females and we found female gender itself a major predictor of preoperative anxiety. Second, majority of these females were housewives occupation subgroup.

In addition, distribution of different occupation was not uniform in our study and majority of patients were housewives in gynaecological / obstetrical surgery group. Highest level of anxiety was found in obstetrical surgery followed by gynecological surgery and rest of surgical subsets were less anxious. Lowest frequency of anxiety was found in neurosurgical patients.

In some prior studies done by Moerman et al[1] and Boker et al,[13] type of surgery was not important in predicting preoperative anxiety while in one study done by Kindler et al,[10] otolaryngological and thoracic surgeries were associated with higher level of anxiety.

One critique on our study is that we recorded observations for anxiety levels on the evening before surgery and our results are based on this, there is a possibility that anxiety level in the preoperative area just before surgery may show different results. A study by Lichtor et al[19] stated that irrespective of timing of recording of anxiety, the frequency and level of anxiety remained the same. Some of the other factors which were found to be related to anxiety in other studies were preference of presence of accompanying person with patient[14] and information seeking behaviour.[1] We did not study these factors. Another critique is that we have taken the cutoff for significant anxiety based on previous studies in Western population and may not be the cutoff for the local population. We were unable to locate any such study in the local population. This can be an area of further research. Till such research is available Western standards will need to be applied.

Finally, we observed the correlation between STAI and VAS scale and found that low STAI scores were associated with low VAS scores and vice versa. We retrieved the cutoff value of VAS score of 45 for deciding the presence or absence of anxiety. This value was derived against STAI score of 44 taking STAI as gold standard for measurement of anxiety. Literature suggests slightly higher cutoff value (i.e. VAS score of 50).[8] Reason of this higher value in a study by Millar et al[9] may be because majority of their scores on VAS scale clustered around score of 50. No such clustering of data at any specific score was observed. However, frequency of anxiety was identical (i.e. 62%) in our study irrespective of the use of VAS or STAI. Because of excellent correlation between VAS and STAI, it is recommended that either scale can be used to assess anxiety before surgery.[8,10,13]

Conclusion

In the presented study, over all frequency of preoperative anxiety was 62%. Factors which were positively correlated with anxiety were female gender, younger age and higher education level. Factors which were shown to reduce anxiety were prior experience of surgery and preoperative anaesthesia clinic visit. It was also observed that Visual Analogue Scale correlated well with State Trait Anxiety Inventory and either scale can be used to assess anxiety in our preoperative surgical patients.

Acknowledgement

References

1. Moerman N, Vandam FS, Muller MJ, Oosting H. The Amsterdam Preoperative Anxiety and Information Scale (APAIS). Anesth Analg 1996; 82:445-51.

2. Ng EH, Miao B, Ho PC. Anxiolytic premedication reduces preoperative anxiety and pain during oocyte retrieval.Hum Reprod 2002; 17: 1233-8.

3. Maranets I, Kain ZN. Preoperative anxiety and intraoperative anesthetic

requirements. Anesth Analg 1999; 89:1346-51.

4. Kain ZN, Sevarino F, Alexander GM, Pincus S, Mayes LC. Preoperative anxiety and postoperative pain in women undergoing hysterectomy. A repeated-measures design. J Psychosom Res 2000; 49:417-22.

5. Shevde K, Panagopoulos G. A survey of 800 patients knowledge, attitudes and concerns regarding anesthesia. Anesth Analg 1991; 73:190-8.

6. Hicks JA, Jenkins JG. The measurement of preoperative anxiety. J R Soc Med 1988; 81:517-9.

7. Wallin BG. Neutral control of human skin blood flow. J Auton Nerv Syst 1990; 30:185-90.

8. Millar K , Jelecic M, Bonke B, Asbury AJ. Assessment of preoperative anxiety: comparison of measures in patients awaiting surgery for breast cancer. Br J Anesth 1995; 75:180-3.

9. Spielberger CD, Gorsuch RL, Lushene RE. State trait anxiety inventory manual. Palo Alto, CA: Consulting Psychologists Press, 1970.

10. Kindler CH, Harms C, Amsler F, Ihde-Scholl T, Scheidegger D. The visual analogue scale allows effective measurement of preoperative anxiety and detection of patient's anesthetic concerns. Anesth Analg 2000; 90:706-12.

11. Zigmond AS, Snaith RP. The Hospital Anxiety and Depression Scale.Acta Psychiatrica Scandinavica 1983; 67:361-70.

12. Kain ZN, Mayes LC, Cicchetti DV, Bagnall AL, Finley JD, Hofstadter MB. The Yale preoperative anxiety scale, how does it compare with a gold standard? Anesth Analg 1997; 85:783-8.

13. Boker A, Brownell L, Donen N. The Amsterdam preoperative anxiety and information scale provides a simple and reliable measure of preoperative anxiety. Can J Anesth 2002; 49: 792-8.

14. Domar AD, Everett LL, Keller MG. Preoperative anxiety: is it a predictable entity? Anesth Analg 1989; 69:763-7.

15. Caumo W, Schmidt AP, Schneider CN, Bergmann J, Iwamoto CW, Bandeira D, et al. Risk factors for preoperative anxiety in adults. Acta Anaesthesiol Scand 2001; 45: 298-307.

16. Iftikhar uddin, Abdullah K, Tahir J, Rahila I. Pre-operative anxiety in patients admitted for elective surgery in King Saud hospital, Unaizah, Al-Qassim Kingdom of Saudi Arabia. Pak J Med Sci 2002; 18: 306-10.

17. Klopfenstein CE, Forster A, Van Gessel E . Anesthetic assessment in an outpatient consultation clinic reduces preoperative anxiety. Can J Anaesth 2000; 47: 511-5.

18. Task Force on DSM-IV, American Psychiatric Association. Anxiety disorders. In: Diagnostic and Statistical Manual of Mental Disorders. 4th ed, text revision. Washington DC: American Psychiatric Pub Inc 2000; pp 429-84.

19. Lichtor JL, Johanson CE, Mhoon D, Faure EA, Hassan SZ, Roizen MF. Preoperative anxiety: Does anxiety level the afternoon before surgery predict anxiety level just before surgery? Anesthesiology 1987; 65: 595-9.