

The measurement of preoperative anxiety

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Summary

Preoperative anxiety was assessed using the hospital anxiety and depression (HAD) scale, multiple affect adjective check list (MAACL) and linear analogue anxiety scale (LAAS) in 100 consecutive day case patients undergoing termination of pregnancy. The HAD scale, a recently introduced self assessment scale comprising 7 multiple choice questions, was readily accepted and easily understood by patients. There was a high degree of correlation between the HAD scale and both the MAACL (correlation coefficient 0.74) and the LAAS (correlation coefficient 0.67). There was only a moderate degree of correlation between the HAD scale and the anaesthetist's assessment of anxiety (correlation coefficient 0.46). The HAD scale is a useful method of subjective measurement of preoperative anxiety.

Introduction

Many patients about to undergo surgery quite naturally experience anxiety. Various steps are taken to try to reduce this anxiety. The most important of these are the preoperative visit by the anaesthetist¹ and the use of premedicant drugs. A variety of objective and subjective methods are available for measuring preoperative anxiety. Objective estimates of preoperative anxiety include indirect measurements of sympathetico-adrenal activity using heart rate and blood pressure², or skin conductance³. Plasma cortisol⁴, urinary catecholamine excretion⁵ and recently plasma catecholamines⁶ have been used as more direct measurements of sympathetico-adrenal activity. Subjective methods include self assessment by the patient using a multiple affect adjective check list⁷, a linear analogue anxiety scale⁸ or more complex questionnaires which attempt to distinguish immediate 'state' anxiety from underlying 'trait' anxiety⁹. Observer ratings may also be used¹⁰. The number of methods available indicates the difficulty in making a straightforward, accurate, reproducible assessment of anxiety.

A recently introduced self assessment scale, the hospital anxiety and depression scale¹¹, has been used successfully in assessing anxiety in general medical outpatients. The scale has high specificity and sensitivity¹². There are no published data on its use for assessment of anxiety in preoperative patients. We therefore undertook a study to assess the usefulness of the hospital anxiety and depression scale in measuring anxiety in preoperative patients.

Methods

One hundred consecutive patients undergoing termination of pregnancy as day case patients were included in the study, which had local ethical committee

approval. Following admission to the day case ward, patients were assessed and examined by the anaesthetist as usual. The nature of the study was then explained and the patient asked to complete a 3 part questionnaire. Patients whose first language was not English were excluded from the study. None of the patients received premedicant drugs.

The first section of the questionnaire was the hospital anxiety and depression (HAD) scale, 7 multiple choice questions each with 4 possible answers. As originally described¹¹ the HAD scale had 14 questions, 7 scoring anxiety and 7 scoring depression. We omitted those questions relating to depression. The questions relating to anxiety are shown in Table 1; the figure in parentheses indicates the score for each response. Patients were asked to read each question and place a tick against the reply that came closest to how they had been feeling that day. Each answer was scored 0, 1, 2 or 3. The possible range of scores was therefore 0 to 21, with higher scores indicating greater levels of anxiety.

The second section of the questionnaire was a multiple affect adjective check list (MAACL) consisting of 21 adjectives presented in random order⁷. The adjectives used are shown in Table 2; the sign in parentheses indicates either an 'anxiety present' (+) or 'anxiety absent' (-) adjective. Patients were asked to tick all those words which best described their feelings at that moment. One mark was scored for each of 11 'anxiety present' adjectives selected and also for each of 10 'anxiety absent' adjectives not selected. The possible range of scores was therefore 0 to 21, with higher scores indicating greater levels of anxiety.

The final section of the questionnaire was a linear analogue anxiety scale (LAAS). Patients were asked to indicate on a 100 mm horizontal scale, between the limits 'calm' and 'terrified', how tense they felt at that moment. The anaesthetist also assessed the patient's level of anxiety as absent, slight, moderate or marked.

Results were subjected to standard descriptive statistical analysis. The symmetry of the data is indicated by the Pearson's coefficient of skewness. A zero value means the data is perfectly symmetrical, a negative value indicates the data is skewed to the left and a positive value that it is skewed to the right. Kurtosis describes the 'peakedness' of the data compared with normal distribution, which has a zero kurtosis. A positive value indicates a leptokurtic or peaked distribution, while a negative value indicates a platykurtic or flat distribution. The product moment correlation coefficient was used to determine the degree of correlation between the different measurements of anxiety.

Table 1. Hospital anxiety and depression scale

Please read each question and place a tick in the box opposite the reply that comes closest to how you have been feeling *this morning*. Please tick only one box for each question.

- | | |
|--|---|
| <p>1. I feel tense or 'wound up':</p> <p>Most of the time [] (3)</p> <p>A lot of the time [] (2)</p> <p>Time to time, occasionally [] (1)</p> <p>Not at all [] (0)</p> | <p>5. I get a sort of frightened feeling like 'butterflies' in my stomach:</p> <p>Not at all [] (0)</p> <p>Occasionally [] (1)</p> <p>Quite often [] (2)</p> <p>Very often [] (3)</p> |
| <p>2. I get a sort of frightened feeling as if something awful is about to happen:</p> <p>Very definitely and quite badly [] (3)</p> <p>Yes, but not too badly [] (2)</p> <p>A little, but it doesn't worry me [] (1)</p> <p>Not at all [] (0)</p> | <p>6. I feel restless as if I have to be on the move:</p> <p>Very much indeed [] (3)</p> <p>Quite a lot [] (2)</p> <p>Not very much [] (1)</p> <p>Not at all [] (0)</p> |
| <p>3. Worrying thoughts go through my mind:</p> <p>A great deal of the time [] (3)</p> <p>A lot of the time [] (2)</p> <p>From time to time but not too often [] (1)</p> <p>Only occasionally [] (0)</p> | <p>7. I get sudden feelings of panic:</p> <p>Very often indeed [] (3)</p> <p>Quite often [] (2)</p> <p>Not very often [] (1)</p> <p>Not at all [] (0)</p> |
| <p>4. I can sit at ease and feel relaxed:</p> <p>Definitely [] (0)</p> <p>Usually [] (1)</p> <p>Not often [] (2)</p> <p>Not at all [] (3)</p> | |

Table 2. Multiple adjective check list

Please tick *all* those words which describe your feelings at the moment.

- | | | |
|--------------------------|--------------------------|------------------------|
| Upset [] (+) | Cheerful [] (-) | Afraid [] (+) |
| Thoughtful [] (-) | Frightened [] (+) | Loving [] (-) |
| Happy [] (-) | Calm [] (-) | Panicky [] (+) |
| Terrified [] (+) | Shaky [] (+) | Pleasant [] (-) |
| Contented [] (-) | Fearful [] (+) | Worrying [] (+) |
| Nervous [] (+) | Steady [] (-) | Secure [] (-) |
| Tense [] (+) | Desperate [] (+) | Joyful [] (-) |

Results

All 100 patients in the study completed the HAD section of the questionnaire correctly. The MAACL section of the questionnaire was also completed by all 100 patients. However, although patients were asked to tick all those words that best described their feelings, 17 patients ticked only one word. Eighty-four patients managed to complete the LAAS section of the questionnaire.

The distribution of scores for the HAD scale, MAACL and LAAS are shown in Figures 1, 2 and 3, respectively. The results of standard descriptive statistical analysis of the data are shown in Table 3.

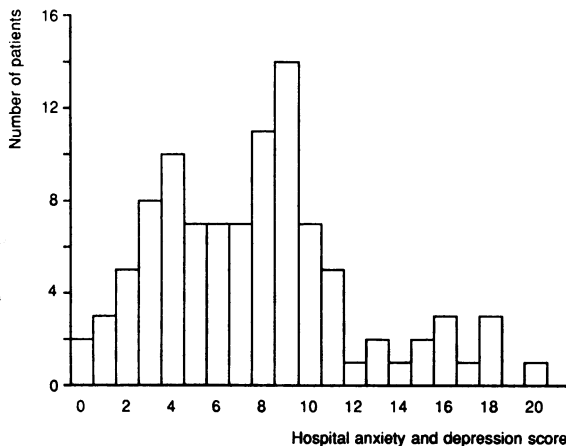


Figure 1. Hospital anxiety and depression scale - distribution of scores in 100 patients

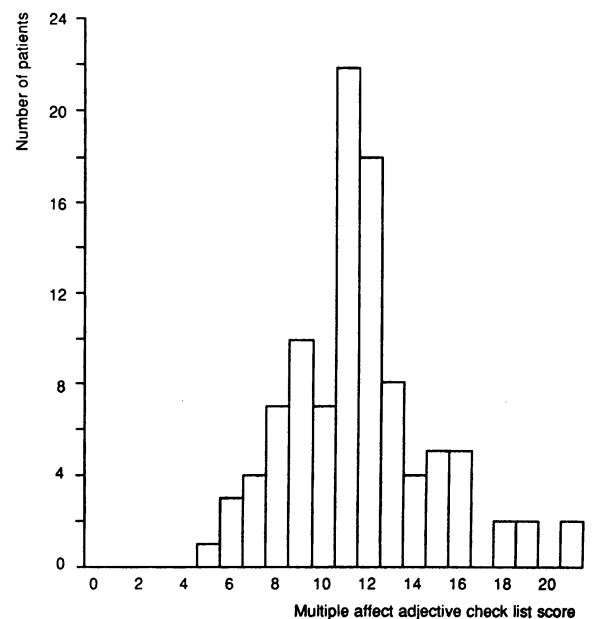


Figure 2. Multiple affect adjective check list - distribution of scores in 100 patients

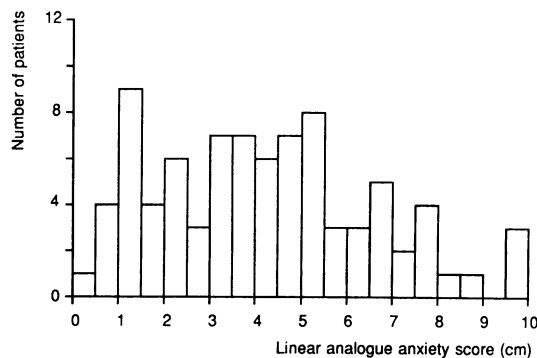


Figure 3. Linear analogue anxiety scale - distribution of scores in 84 patients

Table 3. Results of hospital anxiety and depression scale (HAD), multiple affect adjective check list (MAACL) and linear analogue anxiety scale (LAAS) scores in 100 patients

	HAD	MAACL	LAAS
Number of observations	100	100	84
Possible range	0-21	0-21	0-10
Observed range	0-20	5-21	0.1-10
Mean (\pm SD)	7.6 (\pm 4.39)	11.6 (\pm 3.13)	4.2 (\pm 2.37)
Skewness	+0.653	+0.675	+0.437
Kurtosis	+0.096	+0.778	-0.469

The distributions of the HAD scale, MAACL and LAAS scores are all skewed to the right. The distribution of HAD scale scores has a kurtosis of close to zero, indicating a near normal distribution, while the MAACL scores have a leptokurtic distribution and the LAAS scores a platykurtic distribution. There is a high degree of correlation between the HAD scale and the MAACL (correlation coefficient 0.74), and also between the HAD scale and the LAAS (correlation coefficient 0.67). The correlation between the MAACL and the LAAS is of a similar order (correlation coefficient 0.63).

The anaesthetists' assessment of anxiety was recorded in 95 patients. Anxiety was thought to be absent in 24 patients, slight in 45, moderate in 20 and marked in 6. There is a moderate degree of correlation between the anaesthetists' assessment of anxiety and the HAD scale, MAACL and LAAS (correlation coefficients 0.46, 0.46 and 0.29, respectively).

Discussion

Preoperative anxiety is a complex subjective response influenced most importantly by the patient's temperament, and his or her understanding or lack of understanding of their illness and the proposed surgery. The main aim of modern premedication is to allay anxiety. The long held clinical view that a preoperative visit by the anaesthetist is beneficial to the patient was confirmed when Egbert *et al.*¹ showed that a preoperative visit alone was almost as effective in allaying anxiety as the combination of a preoperative visit and premedication. Premedication alone was only slightly better than omitting both premedication and the preoperative visit. The importance of the preoperative anaesthetic visit has been confirmed more recently by Leigh *et al.*⁹

All the patients in this study were undergoing termination of pregnancy as day cases. While patients

having day case surgery may not suffer as much environmental stress as inpatients, they do not have the benefit of a preoperative visit by the anaesthetist on the day prior to operation, nor do they receive anxiolytic premedication. In view of the nature of the procedure one might expect patients undergoing termination of pregnancy to be more anxious than patients undergoing other types of minor surgery. Our study has shown that this is not the case. The mean MAACL score in our study was 11.6, this is comparable with a mean score of 9.5 in a previous study of preoperative anxiety in inpatients undergoing dilatation and curettage⁷. The mean LAAS score in our study was 4.2, previous studies of preoperative anxiety have produced mean scores of 4.9 in day case surgical patients⁸ and 3.4 in inpatients undergoing minor surgery⁶.

Multiple choice questions are a familiar part of modern life and our questionnaire was readily accepted by all the patients in the study. The HAD scale was easily understood and completed correctly by all the patients in the study. The same was not true of the MAACL or LAAS. The near normal distribution of the HAD scale scores may be of merit when undertaking inferential statistics. We feel observer ratings are, at best, a crude method of assessing preoperative anxiety.

In order to assess the efficacy of treatments aimed at reducing preoperative anxiety a simple, reproducible method of measuring preoperative anxiety is needed. Our study has shown the HAD scale to be a useful subjective measure of preoperative anxiety.

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(Accepted 22 December 1987. Correspondence to Dr Jenkins. Copies of the hospital anxiety and depression scale are available (free in the UK) from: Medical Sciences Liaison Division, Upjohn Ltd, Fleming Way, Crawley, West Sussex RH10 2NJ, UK)