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Preoperative Anxiety and Information Requirement in Koreans: The Contributing Factors of Anxiety and the Effect of Midazolam as an Anxiolytic Premedication

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= Abstract =

Background: The objectives of the present investigation were to assess the level and contributing factors of Korean patients' anxiety and information requirement in the preoperative phase, and in addition, to confirm the efficacy of intramuscular midazolam as a routine anxiolytic premedication.

Methods: The informed patients were randomized to receive either a placebo (n = 155) or 0.05 mg/kg I.M. midazolam (n = 92) 1 hour prior to arriving at the operating room. All patients were asked by the anesthesiologist to complete a six-item questionaire, APAIS (Amsterdam Preoperative Anxiety and Information Scale) at a preoperative holding area.

Results: Female and cancer patients may serve as useful predictors of patients at risk for preoperative anxiety. There is a positive relationship between anxiety and information requirement. The patients who had taken 0.05 mg/kg midazolam I.M. as a premedication showed lower anxiety scores than the control group.

Conclusions: In addition to performing careful in-depth assessments of anxiety and identifying coping behaviors, anesthesiologists should try to find more appropriate methods of comprehensive preoperative care. **(Korean J Anesthesiol 2001; 40: S 1～S 8)**

Key Words: Hypnotics: midazolam. Psychologic responses: preoperative anxiety. Surgery: anxiety; assessment; Amsterdam Preoperative Anxiety and Information Scale (APAIS).

INTRODUCTION

Preoperative anxiety is characterized by subjective feelings of tension, apprehension, and worry. Although some investigators suggest that mild to moderate preoperative anxiety is associated with improved postoperative behavioral recovery,[1] most suggest that a high preoperative anxiety state is associated with both psychologically and physiologically adverse outcomes.[2-4]

In anxious patients, larger doses of anesthetics are required to induce the anesthesia, and the anesthesia itself may be associated with autonomic functions.[5,6] Besides, preoperative anxiety have been linked to refusal of certain types of anesthesia,[7,8] intra- and postoperative pain.[9,10] Although the exact percentage of patients who are anxious preoperatively is not known, literatures suggested various

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incidences of between 60% and 80%.[11-13)]

Although a sedative drug is often given as a premedication to relieve fear and anxiety, anxious patients may also benefit from more attention and information from the anesthesiologist. In clinical practice however, the anesthesiologist has very little time for preoperative consultation to identify the anxious patients that may benefit from extra attention. An anesthesiologist could reduce preoperative anxiety more effectively if potential predictors that might assist in the determination of anxiety were identified.

There are many instruments for measuring the patient's level of preoperative anxiety,[14,15)] APAIS (Amsterdam Preoperative Anxiety and Information Scale) can provide anesthesiologists with a valid, reliable, and easily applicable instrument for assessing the level of patient's preoperative anxiety and their need-for-information.[16)]

Another aspect of preoperative care is the patient's need for information. Several studies have shown that information given to patients before a surgery may facilitate recovery.[17,18)] However, some patients want to be informed as much as possible in detail, whereas there are others who shut themselves from any information.[19)]

These different coping styles are almost never honored, as it is practically impossible for the anesthesiologist to discriminate between patients who would like to be fully informed from those who want to know as little as possible. It would be greatly beneficial to clinical practice if anesthesiologists knew whether they were dealing with a patient who wanted more than basic information which is routinely given, or a patient who would rather not be given any extra information.

The objectives of the present investigation were, (a) to assess the level and the contributing factors of Korean patient's anxiety and information requirement in the preoperative phase, and (b) to evaluate the efficacy of intramuscular midazolam as a routine anxiolytic premedication.

METHODS

During a period of 6 months, 247 consecutive surgical inpatients were verbally informed and participated in the present study. Subject exclusion criteria were unavailability, refusal, or inability to complete the questionnaire. Demographic data was gathered from the charts and the patients and included the patient's gender, age, history of previous surgery, preoperative diagnosis, type of surgery, educational background, and patient's occupation. Type of surgery was classified as either major (e.g., hemicolectomy, hysterectomy) or minor (e.g., tonsilectomy). Diagnosis was classified as cancer or noncancer.

Table 1. The Amsterdam Preoperative Anxiety and Information Scale (APAIS)

1. I am worried about the anesthetic.
2. The anesthetic is on my mind constantly.
3. I would like to know as much as possible about the anesthetic.
4. I am worried about the procedure.
5. The procedure is on my mind constantly.
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 five-point scale from 1 = not at all to 5 = extremely.

The patients were randomized to receive either placebo (group 1, n = 155) or 0.05 mg/kg I.M. midazolam (group 2, n = 92) 1 hour prior to arriving at the operating room. All patients were asked by the anesthesiologist to complete the six-item questionnaire, APAIS (Table 1) at a preoperative holding area. Four items represented fear of anesthesia and fear of the surgical procedure, two items represented the need for information.

APAIS scores were not normally distributed and hence non-parametric statistical tests were used. In group 1, a Kruskal-Wallis ranked sum test (a non-parametric version of the one-way analysis of variance) was used to determine whether the APAIS anxiety scores differed by the factors listed in Table 2. For factors with more than two levels (e.g., age, education, occupation) a significant Kruskal-Wallis test was followed by multiple comparisons using Dunn's technique. ANOVA was used for group comparisons of patient characteristics. Student's t-tests

Table 2. Comparison of the APAIS Scores according to Various Factors

	Number of patient	APAIS	
		Anxiety score	Information score
Sex			
Male	60	9.3 ± 4.0	4.7 ± 2.4
Female	95	11.3 ± 4.5*	5.9 ± 2.5*
Age (yr)			
< 20	28	12.7 ± 3.1	6.3 ± 2.1
20-60	124	10.6 ± 4.4	5.6 ± 2.5
60 <	3	10.2 ± 4.7	5.0 ± 2.6
Prior surgery			
Yes	67	9.9 ± 4.3	5.4 ± 2.7
No	86	11.1 ± 4.5	5.5 ± 2.4
Diagnosis			
Cancer	42	12.3 ± 4.5†	5.4 ± 2.3
Noncancer	113	9.9 ± 4.2	5.5 ± 2.6
Operation			
Minor	38	9.3 ± 4.9	5.5 ± 2.7
Major	117	10.7 ± 4.2	5.5 ± 2.5
Education			
None	10	11.6 ± 3.6	5.9 ± 2.5
Elementary school	21	11.2 ± 4.6	4.3 ± 2.1
Middle school	20	9.1 ± 4.5	4.7 ± 2.0
High school	58	10.6 ± 4.8	6.1 ± 2.9
College	40	10.4 ± 3.7	5.4 ± 2.3
Occupation			
None	86	11.5 ± 4.5	5.5 ± 2.5
Student	8	9.1 ± 2.1	5.5 ± 1.9
Physical worker	23	9.1 ± 3.7	4.7 ± 2.3
Office worker	15	9.3 ± 3.0	6.0 ± 2.4
Professional	9	8.3 ± 4.7	5.4 ± 2.9
Service worker	13	10.3 ± 5.6	5.6 ± 2.9

Values are showed as mean ± SD. *: Female patients had significantly higher scores of anxiety and information than men, $P < 0.05$. †: Cancer patients had significantly higher scores of anxiety than noncancer patients, $P < 0.05$.

were used to compare the mean scale scores between the two groups. $P < 0.05$. was considered statistically significant.

RESULTS

The patients did not have any problems completing the APAIS and usually did so in less than 2 minutes. The patients' characteristics are represented in Table 2. They were all Koreans.

Anxiety scale

The anxiety scale consists of four items (questions 1, 2, 4 and 5), 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 of 4 to 20.

Female patients showed a higher score on the anxiety scale ($P = 0.004$) than men. Cancer patients who knew

Table 3. The Relationship between the Score on the Information Scale (Questions 3 and 6) and the Score on the Anxiety Scale (Questions 1, 2, 4, and 5)

Score, information scale	Score, anxiety scale	
	N (%)	Mean ± SD
2-4, little/no information requirement	2 (40)	8.2 ± 3.7
5-7, average information requirement	56 (36)	11.8 ± 3.8*
8-10, high information requirement	37 (24)	13.6 ± 4.7†

*: significant difference with little/no information requirement group. †: significant difference with average information requirement group (Tukey HSD procedure, $P < 0.05$).

Table 4. Comparison of APAIS Scores of Two Groups

	Group 1 (control)	Group 2 (midazolam)
Number of patients	155	92
Age (yr)	41.3 ± 14.1	39.2 ± 13.9
Sex (male/female)	60/95	38/54
Diagnosis (cancer/noncancer)	42/113	22/70
Score, anxiety scale	10.6 ± 4.4	8.7 ± 3.6*
Score, information scale	5.5 ± 2.5	5.0 ± 2.3

Group 1 patients received placebo and group 2 patients were administerd 0.05 mg midazolam I.M. as a anxiolytic premedication. Age, anxiety and information scores are showed as mean ± SD, other values are showed as number of patients. *: significantly lower than group 1 ($P = 0.004$).

their own diagnosis had a higher anxiety score ($P = 0.003$) than non-cancer patients. There was no difference between those who had previous experience of surgery and those who had not. There was a trend for younger patients to be more anxious than older patients ($P = 0.511$) although this difference was not statistically significant. There were no differences between anxiety scores regardless of type of operations, educational background, or the type of occupation (Table 2).

Need-for-information scale

The 'need-for-information scale' consists of two items (questions 3 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.

There were no statistically significant relationships between age, history of previous surgery, diagnosis, type of operations, educational background, type of occupation, and the scores on the information scale. However, female patients had a higher score ($P = 0.003$) on the information scale than men.

In order to investigate whether there was a relationship between the patients' need for information and the level of anxiety, we divided the patients into three groups according to their score on the information scale (Table 3). Patients with a score of 2-4 on the information scale can be classified as having little or no information requirement and can be considered as "blunters". Patients with a score of 5-7 can be classified as having an average information requirement, and those with a score of 8-10 as having a high information requirement. The latter can therefore be considered "monitors". Using these three groups classification for the information scale, it turned out that in a population of 155 patients, the percentages of patients with low, medium, and high information requirements were 40%, 36%, and 24%. As it showed in Table 3, patients with a high information requirement turned out to be the ones who were the most anxious.

Effect of midazolam as a anxiolytic premedication

There were no statistically significant differences in age, sex, and diagnosis between group 1 (control group) and group 2 (midazolam group). The midazolam group, however, had a significantly greater reduction in anxiety scores ($P = 0.004$). There was no difference in 'need-for-information score' between the two groups (Table 4).

DISCUSSION

Consideration for patient's preoperative fears and anxieties are of paramount importance in the quality of anes-

thesiologic care. Although many studies have focused on postoperative outcomes in relation to preoperative anxiety,[20,21] few recent studies have documented what patients specially fear in the perioperative period.[13,22] Moreover, there have been no studies on Korean patient's desire for information and preoperative attitude.

Research shows that female patients reported higher anxiety levels preoperatively than male patients. This is consistent with some previous studies,[16,23] but not in others.[24,25] A possible explanation for the higher anxiety level in women is that the easier socialization associated with hospitalization and the better rapport or understanding between patient and physician may allay anxiety to a greater extent in men than women. In a study of women with chronic disease and women waiting for surgery, researchers discovered that women's separation anxiety scores were higher than those of men. Women were also more likely to describe and communicate their solidarity interactions, intimacy interactions, and shared experiences.[26] Moreover, it should be noted that the anxiety scores reflect self-reported anxiety levels. Female patients may be more likely than male patients to admit or to report heightened levels of anxiety so that these differences may reflect reporting differences, rather than differences in innate level of anxiety. These warrants further research.

In general, many studies indicated that patients with previous anesthesia experience were significantly less anxious and had lower information requirement than those who had never been operated on.[16,27] In this study, having experienced anesthesia or undergone surgery previously made no significant difference in preoperative anxiety and need-for-information. Potential explanations for this interesting result may be due to the lack of understanding on explanation and consent of both physicians and patients. The majority of the patients in this study with previous experience of anesthesia and surgery had lack of information on the procedures that had been conducted on themselves. It appears that the nature and quality of the patient's prior experience with anesthesia is more important than whether they had previously experienced anesthesia. It is also possible that clinicians need to reconceptualize how they assess for anxiety; it may be that the questions doctors ask are much too narrow. Researchers assert that clinicians often do not question patients about prior traumatic experiences in medical settings. Another possibility is that clinicians listen to the stories, but never relate them to the current hospitalization. To improve on this figure, physicians need to ask the patient for his or her specific concerns to address and potentially allay the patient's fear.

Although one study did not find an effect of cancer,[23] it reported that the possibility of cancer was a meaningful predictor of presurgical anxiety. The greatest concern for cancer patients was whether the operation would be a success. Other major fears expressed by cancer and non-cancer subjects were similar (i.e., fear of pain, not awakening from anesthesia, activity limitations, and being away from home and work).

Subjects may use personal resources (i.e., religious benefits) and their cognitive capacities to deal with their anxiety. Religious background or personality effects were not assessed in this study, further studies will be needed to assess the factors that influence a patient's emotion. Anxiety intensity was however, negatively correlated with type of operation, educational background or type of occupation. These results are consistent with other report.[28] In this study, there was a trend for younger patients to be more anxious than older patients, although this difference was not statistically significant. Many studies of surgical patients, age was negatively correlated with state anxiety.[16,23] In contrast, there is also evidence that younger patients indicated significantly more situational anxiety than did older patients.[29] However, it is likely that older patients would have had more experience related surgical procedures than younger patients.

Specifically asking patients about the degree of anxiety, particular concerns, and more individualized assessment may help physician's address and potentially allay those fears.

The results of this study show that 60% of the patients had a positive attitude toward receiving information (score 5). This figure is slightly lower than that of other countries.[16,30,31] It was also found that patients with extremely

high information requirement (score 8) were anxious patients. It is important to realize that anxious patients might derive great benefit from more attention and information. However, extensive information is not always useful and may even induce anxiety.[32] In particular the patients with a blunting coping style may become anxious when confronted with extensive information. Having minimal information reduced anxiety, depression, discomfort, and psychophysiological arousal both before and after the procedure for blunters. By contrast, patients with a monitoring coping style become anxious when they were not provided with as much information as they wanted. Having information reduced behavioral signs of pain during the procedure and reduced psychophysiological arousal by the end of the procedure.[33] Furthermore, high-information monitors were satisfied with the level of information they received, but low-information monitors said they wanted to know more. In this population almost 40% of the patients had a negative or uninterested attitude toward information (score 4). This figure is higher than other countries.[16,30,31] Given the implications for daily medical practice, this is an important point in which every anesthesiologist should be aware of. It is therefore advisable that patients with a score of 5 and above should be given information on their required topics in accordance to their score. A score below 5 should be a signal for providing no more information than is legally required.

Midazolam has hypnotic, anxiolytic, and amnesic properties that make it suitable for pre-anesthetic medication. Four studies evaluated midazolam using a double-blinded, placebo-controlled parallel group design. Two studies reported a significantly greater decrease in anxiety scores at 60 minutes following midazolam than in controls,[34,35] while the other two reported no decrease in anxiety scores at 60 minutes with midazolam.[36,37] In all four studies, the results may have been affected by different levels of anxiety between the groups prior to administration of midazolam. In this study, the patients from the midazolam group had lower anxiety scores than the control group ($P = 0.004$). However, care should be taken not to generalize this result as the conclusion that midazolam 0.05 mg/kg reduced preoperative anxiety in surgery patients. First, the baseline anxiety scores of both groups were not obtained prior to premedication. Besides, this study was not undergone in a double-blinded manner. Second, due to the unequal number of size in each group, type 1 error levels cannot be guaranteed. Third, although midazolam group showed lower anxiety scores than the control group, the score of 8.7 meant that the patients were still evaluated as anxious. In actuality, the level at which a reduction in APAIS score becomes clinically relevant is not known. Should a future study define the reduction in anxiety score that is clinically significant anxiolytic. These results also reaffirm the need to choose adequate methodology of anxiolytic premedications in Korean.

From the results of the present study, it was concluded that 1) female and cancer patients might serve as useful predictors of patient at risk for disabling preoperative anxiety, 2) there is a positive relationship between anxiety and information requirements, 3) the patients with 0.05 mg/kg midazolam as premedication showed lower anxiety scores than the control group.

The aim of this study was to alert anesthesiologists concerning patients who would most likely become highly anxious before a surgery, so those appropriate steps could be taken to decrease anxiety. In addition to performing careful in-depth assessments of anxiety and identifying coping behavior, further research needs to be done to find the appropriate intervention, and premedication can actually result in the decrease of preoperative anxiety.

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