

The effect of pre-endoscopy anxiety level on tolerance of the procedure and the amount of sedative drug dose

Endoskopi öncesi anksiyete derecesinin hasta toleransı ve sedatif dozu üzerine etkisi

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Background and Aims: Upper gastrointestinal endoscopy produces moderate levels of anxiety. High levels of anxiety may affect tolerability of the procedure and may increase both endoscopy- and sedation-related complications. We aimed to investigate the effect of anxiety level on tolerance of the endoscopy procedure and the amount of sedative drug doses. We also investigated the possible patient characteristics that affect the level of pre-procedural anxiety and tolerance of the endoscopy procedure. **Materials and Methods:** All endoscopies were performed under sedoanalgesia. Patients who referred to our endoscopy unit for upper upper gastrointestinal endoscopy and were older than 18 years were enrolled into the study. Patients' anxiety level was assessed by Beck anxiety scale before the endoscopy. **Results:** Two hundred and thirty-three patients (153 females) who fulfilled the inclusion criteria were enrolled in the study. The median age was 45 years. Thirteen patients had a high degree of anxiety before the endoscopy and tolerance was poor in 60 patients. No statistically significant difference was determined between the tolerance groups with regard to mean anxiety scores. **Conclusions:** We found that pre-endoscopy anxiety level does not affect patient tolerance of the procedure. The poor tolerance group was younger than the other tolerance groups and females had higher pre-procedural anxiety than males.

Keywords: Endoscopy, anxiety, tolerance, sedation

INTRODUCTION

Possible factors that could lead to a patient's anxiety before upper gastrointestinal (GI) endoscopy procedure are fear of injury and choking, discomfort and unexpected diagnoses such as cancer (1-3). Pre-procedure anxiety and fear of feeling discomfort and pain can act in concert and aggravate the effect of each factor separately and finally lead to intolerance of the endoscopic procedure (4). Intolerance of endoscopy results in poor quality, lengthening of the procedure time and use of more sedatives. Upper GI endoscopy is an invasive but safe procedure. The complication rate is approximately 0.1% and nearly half of them are related to the cardiopulmonary system. Most of the cardiopulmonary complications result from expected or adverse effects of sedative drugs (5-8). Thus, pre-procedure anxiety is an important factor that forces the use of high amounts of sedatives and as a result induces cardiopulmonary complications.

We aimed to investigate the effect of pre-endoscopy anxiety on tolerance of the endoscopy procedure and the amount of

Giriş ve Amaç: Üst gastrointestinal sistem endoskopisi hastalarda orta düzeyde anksiyete gelişimine neden olmaktadır. Anksiyete düzeyinin yüksek olması hastanın işleme toleransını etkileyebilmekte ve bunun sonucu olarak endoskopi işlemi ve sedasyona bağlı komplikasyon riskini arttırabilmektedir. Bizim amacımız, anksiyete derecesinin hasta toleransı ve uygulanan sedatif dozuna etkisini araştırmaktır. Aynı zamanda, endoskopi işlemi öncesi anksiyete derecesi ve işlem toleransını etkileyen hastaya ait faktörleri de değerlendirdik. **Gereç ve Yöntem:** Üst gastrointestinal sistem endoskopisi yapılacak üzere referans edilen 18 yaş üstü hastalar çalışmaya alındı. Endoskopi işlemi anksiyete derecesi Beck anksiyete ölçeği ile değerlendirildi. **Bulgular:** Toplam 233 hasta çalışmaya alındı. Hastaların 153'ü kadın olup ortalama yaş 45 idi. Otuz hastada endoskopi öncesi yüksek anksiyete düzeyleri saptanırken, 60 hastanın işlem toleransı kötü idi. Tolerans gruplarının anksiyete skorları arasındaki fark istatistiksel olarak anlamlı değil idi. **Sonuç:** Bizim bulgularımıza göre endoskopi öncesi anksiyete derecesi işleme tolerans düzeyini etkilememektedir. İşlemi kötü tolere eden grup yaş ortalaması diğer gruplara göre daha düşük olup, işlem öncesi anksiyete düzeyi kadınlarda erkeklere göre daha yüksektir.

Anahtar kelimeler: Endoskopi, anksiyete, tolerans, sedasyon

sedative drug doses. We also investigated the possible patient characteristics that affect the level of anxiety and tolerance of the endoscopy procedure.

MATERIALS AND METHODS

We completed the study between April and September 2006 with the consent of the Ethical Committee of Başkent University Faculty of Medicine.

Patients

The patients who referred to our endoscopy unit for upper GI endoscopy and were older than 18 years were enrolled in the study. Patients were classified in three groups in accordance with age as follows: young patients, ≤40 years; middle-aged, 41-60 years; and elderly, >60 years.

All patients who were able to give written informed consent for elective diagnostic outpatient endoscopy were included. Patients were asked to complete two forms before the endos-

copy procedure. One of the forms related to demographic characteristics of the patient and the other was the Beck Anxiety Inventory (BAI).

Exclusion criteria included patients who refused the endoscopy, endoscopy procedures carried out under emergency situations, previously planned therapeutic endoscopy, previous history of gastric surgery, hospitalized patients, patients who are unable to complete the forms because of medical or sociocultural issues, patients who did not accept to complete the forms or participate in the study, drug use such as anxiolytics or antidepressants, alcohol or drug addiction, and patients who did not want to use sedatives for endoscopy or for whom endoscopy was planned for reasons other than dyspepsia, such as for transplantation preparation or investigation of the etiology of iron deficiency anemia.

Patient Form

Patient characteristics were recorded, including name, height, weight, previous medical history, and previous history of endoscopy.

Beck Anxiety Inventory (BAI)

The BAI is an easy-to-apply scale that measures the severity of anxiety in adults. It consists of 21 items each rated on a Likert type scale from 0 to 3, and it can be self-administered. Instructions for filling out the form are written on the top of the page. The total score is obtained by summing the points of all items. Scores can range from 0 to 63, and there is a correlation between the score and the severity of anxiety. In accordance with the score obtained with BAI, the anxiety level is categorized as low (0-21 points), moderate (22-35 points) or severe (36-63 points). The BAI was adapted for use in our country in 1998.

Because this inventory a) has been proven to be valid and reliable, b) can show the severity of anxiety experienced in the last week, including today, c) is commonly used in the general population and patient populations other than psychiatry with its easy-to-apply feature, d) can be administered on subjects by researchers outside the psychology field with its self-report scale without any training requirement, and e) has been proven to be valid in Turkey, we were able to use this inventory to assess the short-term anxiety symptoms of patients referred to our endoscopy unit for endoscopy procedure with the complaint of dyspepsia.

Upper GI Endoscopy

Patients were told to discontinue the proton pump inhibitors and antiaggregant-anticoagulant drugs prior to 10 days to endoscopy. If discontinuation of drugs would be harmful to the patient, the patient was excluded from the study. Topical anesthesia with 10% lidocaine was applied to patients before endoscopy. Olympus GIF Q 240 instrument was used for endoscopy.

Sedation

All patients were informed about sedation. A dose of 0.05 mg/kg midazolam was given intravenously to all patients who had no absolute or relative contraindication for using sedatives. Patient's oxygen saturation was followed during endoscopy with pulse oximetry. Despite using midazolam, patients who were still intolerant of endoscopy were given an additional dose of a maximum 1 mg/kg propofol. We aimed to moderate sedation during the procedure. Moderate sedation as defined according to the American Society of Anesthesiologists was achieved for all patients (9).

Patient Tolerance

Patient's tolerance of endoscopy was assessed by an anesthetist who accompanied the procedure as: good, moderate or poor according the criteria listed below subjectively:

- drawback during endoscopy
- retching frequency
- attempting to hold the endoscope
- attempting to speak or shout during the procedure

Statistical Evaluation

The Statistical Package for the Social Sciences (SPSS) 11.0 version was used for statistical analysis. One-way ANOVA test and chi-square test were used for numeric and nominal values.

RESULTS

Two hundred and thirty-three patients (153 females, 80 males) who fulfilled the inclusion criteria were enrolled in the study. The median age was 45 years (18-80 years, SD: 12.72). One hundred and twenty-two (52%) patients had a previous upper GI endoscopy history. Sixty-nine patients had used only midazolam, while 164 patients needed additional propofol of at least 10 mg.

Tolerance of endoscopy was good, moderate and poor in 120, 53 and 60 patients, and the mean age of patients in the three tolerance groups was 47.35±12.09, 42.47±12.67 and 42.78±13.33, respectively. The good tolerance group was older than the moderate and poor tolerance groups (p=0.017) (Table 1).

Tablo 1. Degree of tolerance level according to patients' age, BMI and gender

	Tolerance Level			p
	Good	Moderate	Poor	
Age (year)	47.35	42.47	42.78	0.017
BMI (kg/m ²)	25.94	26.04	26.65	0.58
Gender (M/F)	41/79	16/37	23/37	0.67

BMI: Body Mass Index

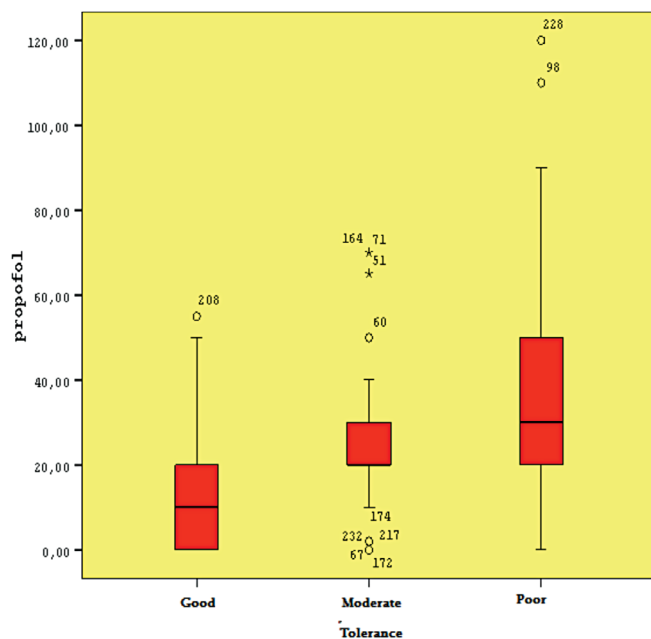


Figure 1. The relation between propofol dose and tolerance of endoscopy.

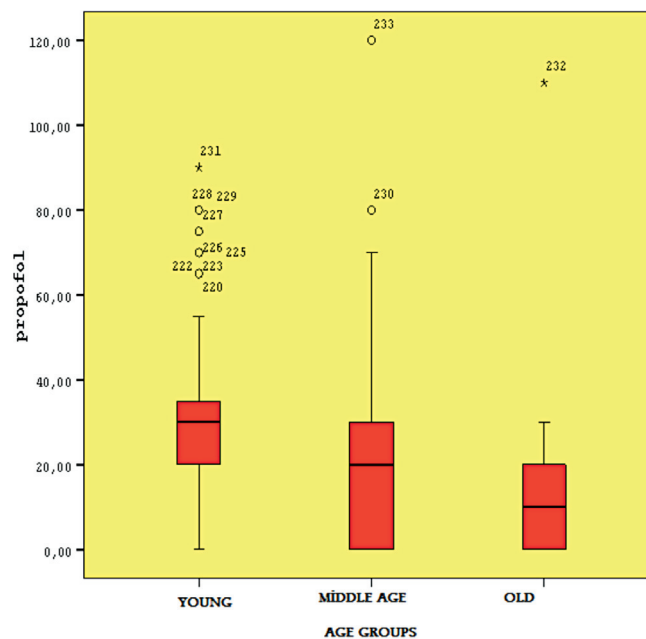


Figure 2. The amount of propofol dose according to the patient's age.

Mean anxiety scores before endoscopy were 14.4 ± 11.21 , 11.45 ± 9.27 and 14.23 ± 11.19 in patients with good, moderate and poor tolerance, respectively. The difference in anxiety scores between groups with regard to tolerability of endoscopy did not reach statistical significance ($p=0.23$).

Doses of propofol were higher in patients with poor tolerance than in those with good and moderate tolerance (Figure 1). The mean propofol doses in young, middle-aged and elderly patients were 28.37, 19.07 and 13.26 mg, respectively. This difference between age groups was statistically significant ($p < 0.001$) (Figure 2).

Patients' tolerance of endoscopy with respect to body mass index (BMI) and gender was similar between groups (Table 1). The amounts of sedative drug dose in accordance with pre-procedural anxiety level were compared. Mean propofol doses of 21.79 ± 21.81 , 19.21 ± 18.06 and 23.84 ± 19.91 were given to patients with mild, moderate and severe anxiety level, respectively. The differences in sedative drug doses between groups were not statistically significant ($p=0.76$). The anxiety level did not seem to be affected with respect to age and BMI, but female patients experienced more anxiety than males ($p=0.002$) (Table 2).

Patients' tolerance of endoscopy, mean propofol dose and pre-procedural anxiety level were similar with respect to previous history of endoscopy (Table 3).

DISCUSSION

Upper GI endoscopy produces moderate levels of anxiety in patients (10). As patients feel more anxiety, their tolerability

of the endoscopy procedure decreases, which results in a poor-quality endoscopy. In order to overcome this problem, different psychological methods have been tried, such as hypnosis, relaxation music and permitting a friend or relative of the patient to be present in the endoscopy room (11). However, none of these has been found as useful as sedative drugs. As a result, the use of sedatives during endoscopy has become widespread.

Upper GI endoscopy is an invasive but safe procedure, with a reported complication rate of 0.1%, and more than half of the complications are related to the use of sedatives instead of to the endoscopy procedure itself (1-4). Previous published studies have reported that over- and under use of sedatives because of the unawareness of the anxiety level of the patient results in more complications and poor quality of the endoscopy (12-15). We designed our study to highlight this topic.

We observed that poor tolerance of the endoscopy procedure results in the use of propofol. This finding was also compatible with the fact that both the doctors' and nurses' judgements about patient tolerance of endoscopy were similar.

Lee et al. (16) reported that anxiety level is an independent factor for sedation level and tolerance of endoscopy and that patients with high anxiety levels experienced more pain and difficulty in reaching the ideal sedation level. However, we did not find a difference with respect to tolerance of endoscopy between patients with different anxiety levels. We think that we achieved a desirable level of sedation in all patients either with midazolam or with additional doses of propofol, such that tolerance of the procedure was satisfactory in all patients irrespective of their anxiety level.

Tablo 2. Pre-endoscopy anxiety level of patients according to patients' age, BMI and gender

	Anxiety Level			P value
	Low	Moderate	High	
Age (year)	45.47	43.68	43.46	0.66
BMI (kg/m ²)	26.26	25.39	26.68	0.5
Gender (M/F)	73/109	6/32	1/12	0.002

BMI: Body Mass Index

Tablo 3. The relation between previous upper GI endoscopy history and tolerance of endoscopy, propofol dose and anxiety level

	History of previous upper GI endoscopy		p
	Yes	No	
Tolerance (n) (good/moderate/poor)	68/26/28	52/27/32	0.38
Propofol dose (mg)	19.59	23.57	0.15
Anxiety level	13.91	13.44	0.73

Previous articles have stated that female patients had higher levels of pre-procedural anxiety and poor tolerance of endoscopy (17,18). In parallel to those studies, we also found that female patients had higher levels of anxiety before endoscopy; however, tolerance of the procedure was unchanged. A possible explanation for this situation could be that in our country, women are more introverted and usually do not express their feelings to the same extent as women in western countries.

Previous studies reported better tolerance of upper GI endoscopy with lower anxiety levels among older patients (19).

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However, in our study, pre-procedural anxiety levels did not change in accordance with age. We found that elderly patients tolerated endoscopy better than young patients and lower sedative doses were used, so we believe that older age is an independent factor with respect to tolerance of endoscopy.

A few studies have reported that lean patients are more irritable and hyperactive during endoscopy (16). However, in our study, we found that tolerance of endoscopy did not change with regard to BMI.

There are conflicting results about the effect of previous endoscopy history on tolerance of the procedure. History of pain or discomfort during a previous endoscopy or of insufficient or no sedation usually increases anxiety levels and affects the tolerance of endoscopy negatively. On the other hand, endoscopy experience with effective sedation and without any difficulty results in minimal anxiety and better tolerance (20-22). In our study, more than half of the patients had a history of previous endoscopy, and 63.5% of them were done with sedation. However, in our study, we could not find any differences in procedure tolerance and sedative drug doses in patients according to the presence or not of previous endoscopy history.

In conclusion, we investigated the relation between patient tolerance, pre-endoscopy anxiety levels and the amount of sedative drug use during upper GI endoscopy and also the effect of contributing factors such as age, gender, BMI, and previous history of endoscopy on these situations. We believe that age is important in the tolerance of endoscopy and also affects the sedative drug dose. Female patients are more anxious before endoscopy. However, it does not seem to affect their tolerance of the procedure.

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