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Does Anxiety or Waiting Time Influence Patients' Tolerance of Upper Endoscopy?

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ABSTRACT

Background/Aims: Endoscopy is an essential and very commonly used procedure for the evaluation of a multitude of gastrointestinal symptoms. Although it is increasingly required, patients often wait on arrival at the endoscopy unit until they are called for the procedure. It is not clear whether or not this waiting time may have an impact on patient's tolerance during upper endoscopy. Our study attempts to address this. **Patients and Methods:** We studied consecutive outpatients who underwent endoscopy from September to December, 2013. Gender, age, body mass index (BMI), previous endoscopic experiences, antidepressant therapy, and the time interval between arrival at the endoscopy unit and the onset of examination was recorded. Anxiety before the procedure, pain, and discomfort were rated by a numeric rating scale (0 = no pain/discomfort encountered to 10 = extremely painful/uncomfortable). **Results:** One hundred and five consecutive outpatients (male = 52; mean age = 45.3 years; age range = 20–86 years) were included in the study. The mean BMI was 25 ± 4.8 ; mean waiting time from registration to the procedure was 172 min (time range = 30 - 375 mins). Mean patients' pre-examination anxiety level was 3 ± 3.84 , mean discomfort score was 4.3 ± 3.09 and mean pain score was 3.4 ± 3.03 . The level of pain and discomfort was significantly higher in patients with higher levels of pre-procedure anxiety. No differences were found in terms of anxiety, pain and discomfort among patients divided according to waiting time. **Conclusions:** According to our data, waiting time does not have a significant impact on the perception of pain and discomfort related to the endoscopic procedure. On the other hand, high pre-procedural levels of anxiety were associated with a low tolerance. Further multicenter randomized trials are needed to clarify the impact of waiting time.

Key Words: Anxiety, discomfort, pain, numeric rating scale, tolerability, upper endoscopy

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The esophagogastroduodenoscopy (EGD) is a fairly safe and well-tolerated procedure. However, high levels of pain or discomfort have been associated with less satisfaction.^[1] Increasing endoscopy tolerance may contribute to increased compliance and improved outcomes,^[2] whereas improving the scheduling for endoscopic examinations should increase patient adherence to this technique. Nevertheless, studies on these topics have not been conclusive.^[3-8] In the same way, the influence that waiting time may have on patients' tolerance, considering the time spent between arrival at the endoscopic

waiting room and the endoscopic examination itself, is not clear.^[6] Only a few studies evaluating the influence of waiting time on patients' satisfaction have been carried out through submitting surveys after the procedure.^[5,9] Among the most important parameters studied, the quantification of pain is essential in order to assess the tolerability.^[10]

Furthermore, the time factor, together with a proper preparatory educational program,^[8] plays a relevant role among those factors that may influence patient tolerance.^[11] The aim of our study was to evaluate the effective impact that waiting time has on patients' tolerance on the day of endoscopy.

PATIENTS AND METHODS

Our cross-sectional study recruited outpatients referred for upper endoscopy at the Endoscopy Unit of "Sapienza"

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University of Rome over the period September–December 2013. Patients aged over 18 years and capable of understanding and completing a questionnaire were included in the study. A specific informed consent was obtained from each included patient. Patients with a history of gastric surgery, intolerance to lidocaine or benzodiazepines, severe cardiac, pulmonary or liver disease, or who used illicit drugs, or were undergoing concomitant treatment with drugs that have potential interactions with midazolam (ie, erythromycin, verapamil, diltiazem, itraconazole, and ketoconazole) were excluded. The study protocol is in accordance with the ethical guidelines of the Declaration of Helsinki. A questionnaire was administered to patients enrolled by external staff in two steps. First, on their arrival at the endoscopic unit, and secondly upon discharge. The questionnaire was structured and acquired in the pre-examination phase, and included demographic data [age, gender, body mass index (BMI), concomitant treatment with psychotropic drugs, and a numeric rating scale (NRS) in order to assess basal anxiety. The second step was carried out after EGD and before discharge, and involved the acquisition of data related to endoscopic examination (waiting time, midazolam dose, complications) and assessment of pain and discomfort using the NRS.^[12-14] The NRS is an 11 (0–10) point verbally delivered scale where the end points are the extremes of 0 = no presence and 10 = maximum presence.^[15]

Waiting time on the day of upper endoscopy was defined as the time spent from check-in at the reception of the endoscopy unit to the procedure itself, and was categorized by tertiles as follows: <2 h, 2–3 h, and >3 h. Thus, patients enrolled were firstly divided into three groups and categorized as <2 h, 2–3 h, and >3 h considering the waiting time on the day of endoscopy [Figure 1].

The endoscopic procedure was performed under conscious sedation, and without any reference to the questionnaires. Patients received a dose of 2–5 mg of midazolam, with a 0.07 mg/kg dose protocol, administered by three experienced endoscopists (Clarify the acronyms) who used a standard upper endoscope. Routine monitoring of vital signs by pulse oximetry was ensured during examinations.

Statistical analysis

Data are presented as means, standard deviations, ranges, and percentages for categorical variables. The analyses were performed with SPSS version 13.0 (SPSS Inc., Chicago, IL, USA). The Chi-square test was used to analyze categorical independent variables. *t*-Tests were carried out to analyze continuous variables. A three-way analysis of variance was used to analyze differences among three groups of patients categorized as <2 h, 2–3 h, and >3 h considering the waiting time on the day of upper

endoscopy. A *P* value of < 0.05 was assumed as indicative of statistical significance.

RESULTS

One hundred and five consecutive outpatients were included in our study. All enrolled patients agreed to answer the questionnaire. The mean age was 45.3 years (age range = 20 – 86 years), 52 (49%) were males, 43% were booked for their first endoscopic examination. BMI was 25 ± 4.8 , mean waiting time from registration to the procedure itself was 172 mins (time range = 30 - 375 mins) [Table 1]. Mean patients' pre-examination anxiety level was 3 ± 3.84 , mean discomfort score was 4.3 ± 3.09 , and mean pain score was 3.4 ± 3.03 .

No differences were found in terms of anxiety, pain, and discomfort among patients divided according to the waiting time [Figure 1].

Analyzing the anxiety level obtained by NRS, the trend does not change with respect to the waiting time [Figure 2]. In the same way, the trend related to the pain level does not change with respect to the waiting time [Figure 3].

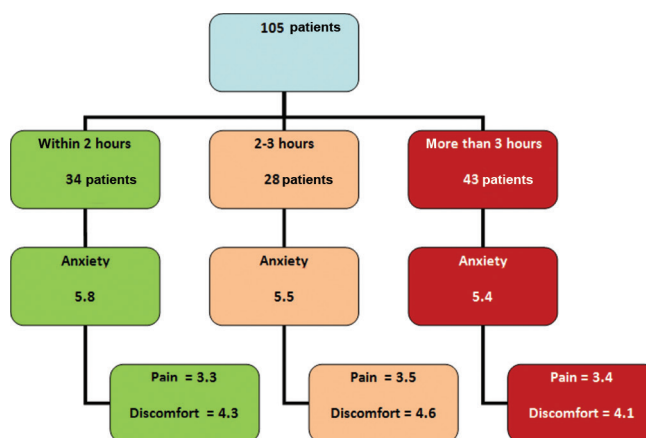


Figure 1: Study flow-chart and distribution of patients considering the waiting time

Table 1: Patient characteristics and procedure-related information

Patients, <i>n</i>	105
Gender, <i>n</i> (%)	
Male	52 (49)
History of previous gastroscopy, <i>n</i> (%)	
No	45 (43)
Antidepressants use	13 (12)
Mean patients' anxiety level	5.6
Mean BMI*	25
Mean waiting time from registration to the procedure, min	172'

*BMI: Body mass index

Ten patients reported no pain or discomfort during the procedure. In this group of patients (mean BMI 25 ± 4.8 , range 18.7–29.3; 7 males), none were receiving antidepressants, the mean level of pre-procedure anxiety was 3 ± 3.84 and the mean waiting time was 150 ± 60 mins (range 80 - 252 mins).

Considering these results, we divided the participants into two groups split at the median pain level (Group A = up to 4, Group B = 5–10). There were no significant differences in the two groups examined. As expected, the two groups were statistically homogeneous for all data recorded, except for the levels of pain ($P = 0.0001$) and discomfort ($P = 0.0001$).

Therefore, we divided the patients into two groups, considering just the level of pain (Group No Pain = level 0; Group Pain = level more than 0) regardless of the discomfort level. Thus, we obtained a no-pain group of 27 patients and a second group of 78 patients with some level of pain perceived during endoscopy [Table 2].

In this case, a statistically significant difference was documented considering the pre-exam anxiety level ($P = 0.0204$).

DISCUSSION

Previous studies indicate that waiting time on the day of endoscopy, and pain during EGD, were the main reasons for patient dissatisfaction.^[4,5] On the other hand, high pre-procedural levels of anxiety could be associated with a low tolerance and a preference for future sedation.^[16] Recently, Azmi *et al.*^[5] evaluated patient satisfaction in outpatients undergoing upper endoscopy, highlighting the negative impact on patient satisfaction of waiting time on the day of the procedure. Despite the increase in demand

for endoscopy, only few studies have examined the actual impact of this waiting time.

We expected to find a great impact of waiting time on anxiety and pain levels. Patients, who wait longer before undergoing EGD, were thought to have higher pre-examination anxiety levels; on the contrary, we found that the anxiety level trend was stable regardless of the amount of waiting time [Figure 2]. Similarly, waiting time did not significantly impact on pain either. Indeed, the pain level trend was the same, regardless of the time spent waiting for the start of the examination [Figure 3]. However, there was a slight but significant distinction between patients' satisfaction and the level of pain experienced during the EGD. Although it is reasonable to assume that a long waiting time may have

Table 2: Patients were divided into two groups according to the pain level: Group No pain (0 on the NRS) and group pain (more than 0)

	Group no pain	Group pain	P
Patients n	27	78	
Gender, n (%)			
Male	15 (55)	37 (47)	ns
History of previous gastroscopy, n (%)			
No	16 (59)	44 (56)	ns
Antidepressants use	2 (7)	11 (14)	ns
Mean patients' anxiety level	4.3±4.04	6±2.91	0.02
Mean BMI*	25.7±4.2	24.8±5.0	ns
Mean waiting time from registration to the procedure, min	186±69	168±80	ns
Midazolam dose	2.57±1.62	2.09±1.55	ns

*BMI: Body mass index

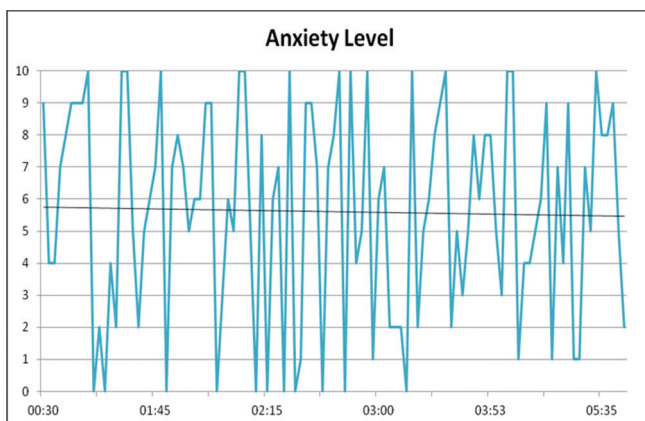


Figure 2: Anxiety before the procedure was rated on an ascending scale from 0 to 10 (0 = no anxious to 10 = extremely anxious) represented on Y axis. X axis represents the waiting time. The bar represents the anxiety level trend during the waiting

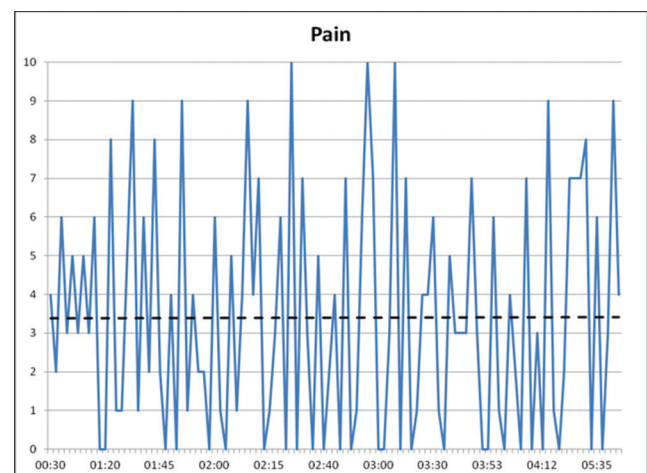


Figure 3: Pain during the procedure was rated on an ascending scale from 0 to 10 (0 = no pain to 10 = extremely painful) represented on Y axis. X axis represents the waiting time. The bar represents the pain level trend in relation to the waiting time

a negative impact on patient satisfaction and quality, where quality is referred to the standard of the service provided, we cannot affirm that this might affect the degree of pain experienced objectively.

To find out what factors were related to higher levels of pain experienced during EGD, we divided the patients into two groups considering the median pain level as a divisor (Group A = up to 4, Group B = 5–10); the median anxiety level, the mean waiting time from registration to the procedure itself, and all the data reported in Table 3, were calculated for both groups. The results obtained were similar, and there were no significant statistical differences related to anxiety levels or waiting time.

In addition, when participants were divided into two groups by just considering the degree of pain (Group No Pain, Group Pain: Presence of any levels of pain), we did not obtain any significant differences between the two groups for waiting time and for all the other data recorded, with the exception of the anxiety level. Patients who felt pain during the EGD, showed higher pre-procedural anxiety levels than patients who did not feel pain during the examination ($P = 0.02$) [Table 2]. As suggested in the Peña *et al.*^[17] study, the pre-examination anxiety seems to be the only parameter that influences the feeling of pain during the EGD, and this parameter is able to affect the quality of the upper endoscopy, rather than waiting time.

According to our observations, reducing pre-procedural anxiety levels may prevent the pain experienced by patients during the performance of the EGD, and thus increase the patients' satisfaction, that is considered as a measure of a high-quality endoscopy.^[18] All the staff of the endoscopy center should be trained to perform all those actions aimed

at reducing the pre-examination anxiety of patients, such as adequately informing patients on the procedure with detailed informed consent that clarifies all their doubts and fears, reassures, and relaxes them. Recently Lee *et al.*^[8] investigated the relationship between a preparatory education program and the degree of discomfort and retching of examinees during upper gastrointestinal endoscopy. They compared a group of patients who had received an education program before undergoing EGD, with a control group who did not receive it. The preparatory education program consisted of information about the procedure, behavioral intervention such as deep breathing or relaxation exercises, and cognitive intervention using an audiotape containing music, and narration to calm anxiety. They found that this program could significantly relieve the discomfort caused by endoscopy. This study and our study highlights the importance of performing standard pre-procedural interventions aimed at relaxing and reducing anxiety, in order to reduce pain, to achieve patient satisfaction and to perform a high-quality endoscopy.

This study was designed to evaluate the impact that waiting time may have on upper endoscopy tolerability. However, considering the results obtained, this parameter may have impacted on patient satisfaction rather than tolerability, and we believe that more resources should be devoted to pre-endoscopy procedures in order to reduce pain and discomfort during EGD.

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Table 3: Patients were divided into two groups according to the median pain level: Group A=up to 4 and Group B=5 to 10

	Group A	Group B	P
Patients n	69	36	
Gender, n (%)			
Male	33 (48)	19 (53)	0.683
History of previous gastroscopy, n (%)			
No	30 (43)	15 (42)	1
Antidepressants use	8 (12)	5 (14)	
Mean patients' anxiety level	5.4±3.25	5.9±3.4	0.463
Mean BMI*	25±4.8	25.1±4.8	0.919
Mean waiting time from registration to the procedure, min	171±74	175±84	0.802
Midazolam dose	2.34±1.47	1.96±1.75	0.242

*BMI: Body mass index

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