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Anxiety and Pain Perception in Patients Using Analgesics Before Wisdom Tooth Surgery

Yirmi Yaş Diş Ameliyatı Öncesi Analjezik Kullanan Hastalarda Anksiyete ve Ağrı Algısı

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ABSTRACT

INTRODUCTION: The aim of this study was to investigate anxiety and pain perception in patients using analgesics before wisdom tooth surgery.

METHODS: We included 50 patients, aged 18-70, who were to undergo third molar dental surgery. The anxiety levels of the patients were measured using the Spielberger State-Trait Anxiety Inventory (STAI FORM TX-1) and (STAI FORM TX-2). The pain scores of patients in the postoperative period were assessed using the Visual Analog Scale (VAS).

RESULTS: For Group LA, STAI-I was 27±4.7 and STAI-II was 30±4.3. For Group HA, STAI-I was 43±4,5 and STAI-II was 42.6±5.2. The pain scores of patients in both groups were found to be similar at all times in the postoperative period.

DISCUSSION AND CONCLUSION: Preoperative anxiety is well-documented in 60 to 80 % of the patients who are to undergo surgery. This anxiety may depend on the type of anesthesia, patients' previous experience, personal characteristics, surgical procedures and postoperative pain. We concluded that no significant correlation was found between preoperative anxiety and postoperative pain in the case of third molar dental surgery.

Keywords: *Oral surgery, anxiety, STAI, pain*

ÖZ

GİRİŞ ve AMAÇ: Bu çalışmanın amacı, üçüncü molar diş ameliyatı geçiren hastalarda ameliyat öncesi anksiyetenin ameliyat sonrası ağrı üzerine etkisini araştırmaktır.

YÖNTEM ve GEREÇLER: Çalışmaya üçüncü molar diş ameliyatı olacak 18-70 yaş arası 50 hasta dahil edilmiştir. Hastaların anksiyete düzeyleri Spielberger Durumluk-Sürekli Kaygı Envanteri STAI FORM TX-1 ve STAI FORM TX-2 kullanılarak ölçülmüştür. Hastaların postoperatif dönemde (15. dakika, 30. dakika, ardından 1., 2., 4., 6., 8., 12. ve 24. saat) ağrı skorları Görsel Analog Skala (VAS) ile değerlendirilmiştir.

BULGULAR: Düşük anksiyete düzeyine sahip grup için STAI-I 27±4.7 ve STAI-II 30±4.3 olarak saptanmıştır. Yüksek anksiyete düzeyine sahip grup için ise STAI-I 43±4,5 ve STAI-II 42,6±5,2 olarak bulunmuştur. Her iki gruptaki hastaların ağrı skorları postoperatif dönemde her zaman benzer olarak bulunmuştur.

TARTIŞMA ve SONUÇ: Ameliyat öncesi kaygı, ameliyat olacak hastaların %60-80'inde iyi belgelenmiştir. Bu kaygı anestezi tipine, hastaların önceki deneyimlerine, kişisel özelliklerine, cerrahi işlemlere ve ameliyat sonrası ağrıya bağlı olabilir. Üçüncü molar diş cerrahisi durumunda preoperatif anksiyete ile postoperatif ağrı arasında anlamlı bir ilişki bulunmadığı sonucuna ulaşılmıştır.

Anahtar Kelimeler: *Oral cerrahi, anksiyete, STAI, ağrı*

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INTRODUCTION

Anxiety is an emotional reaction which can incorporate tension(stress), apprehension, nervousness and concerns caused by an intangible and diffuse advancing threat or approaching danger, accompanied by activation of the autonomous nervous system. [1] Fear, in contrast, is often described as the reaction to a perceived threat or situation that is actually present. Anxiety prepares an organism for uncertainty or potential danger, and fear prepares an organism to act (fight or flee) in actual threatening situations. [2]

Moderate to severe acute postoperative pain occurs frequently after different surgical procedures and involves up to 40% of patients undergoing ambulatory surgery. Numerous authors have studied the influence of anxiety in the experience of pain suffered by patients during and after surgery. High levels of pre-surgical anxiety may have negative influences in post-surgical physical and mental recovery, resulting in longer hospital stays or increased need for analgesics. Both of which can be detrimental to the health of the individual as well as health care services due to increased costs. [1]

Anxiety has been studied in two ways: firstly as a personality trait (in which case we refer to it as trait anxiety) and secondly as an individual's temporary emotional state at a particular time or place (in which case we refer to it as state anxiety). Trait anxiety is a relatively common tendency which anyone can experience when facing situations perceived as threatening. State anxiety is a transitory emotional condition, characterized by subjective and consciously perceived feelings of stress and apprehension and by hyperactivity of the autonomous nervous system. Dental anxiety falls into the category of state anxiety. Both variables are, in principle, independent. This means that a person with trait anxiety may not present with state anxiety at any time but a person without this trait can still manifest anxiety. The influence of both factors, trait and state anxiety, on postoperative variables, has been approached in several studies. [1]

Patients who have never experienced tooth extraction before, and those who have had a difficult previous extraction experience, can feel fear and anxiety to different degrees before third molar tooth surgery. Treatment procedures involved in oral surgery tend to bring about the greatest anxiety levels in dental practice. The most common treatment is impacted third molar tooth removal. [3] Impaction of third molars is a common condition that may require an extraction operation with a greater degree of difficulty than others and a higher risk of complications. The most potent stress factors resulting in the occurrence of anxiety and fear are expectation of pain, fear of needles and injections, failure by the surgeon himself, length of operation time and fear of catching a treatment-related infectious disease. All these factors can contribute to the degree of anxiety however some patients are surprisingly successful in avoiding it. [4]

Certain assesments have been developed which measure the patient's fear and anxiety level before the 'fearful process' has developed. The State-Trait Anxiety Inventory (STAI), widely used to measure treatment anxiety, is a questionnaire developed in 1970 by Spielberger et al. It consists of short sentences which discriminate between event-specific and continuous anxiety in the patient. The emotional state of the patients can be rapidly scored via this questionnaire. 'The State-Trait Anxiety Inventory' (STAI), assesses both state and trait anxiety simultaneously and quantitatively in dental patients. State anxiety (STAI-S) is almost synonymous with fear and is variable in time and intensity. Trait anxiety on the other hand (STAI-T) reflects a person's personality disposition, but it is probably an unreliable predictor of a patients postoperative symptoms.[5,6]

It was hypothesis preoperative anxiety levels, as measured by the State-Trait Anxiety Inventory, do impact postoperative pain perception in patients undergoing third molar tooth surgery. However, when preemptive analgesia is administered, effective pain management measures can mitigate the potential influence of anxiety on the postoperative experience. This study aim to investigate the effect of pre-operative anxiety on post-operative pain after surgical removal of third molars.

MATERIAL and METHODS

We performed a prospective study on a consecutive series of 50 patients who underwent lower third molar extraction in the Oral Surgery Department of the Dentistry Faculty at Ege University. The study was approved by the local Ethical Committee. All patients complained of pain and discomfort, associated with pericoronitis or caries of their third molars. They were uniformly informed about the complications associated with third molar surgery with a list of risks, and gave their written informed consent.

Patients aged between 18 and 70, with no hematological disease, no known allergies to local anaesthetics and NSAIDs were included in the study. Patients in need of further oral surgery, who did not consent to participate or those whose questionnaires had errors were excluded from the study. The sample therefore was composed of 40 patients undergoing lower third molar removal.

STAI-1 and STAI-2 anxiety tests were carried out on 50 patients before third molar extraction. Patients with scores of STAI-1≤35 and STAI-2≤35 were considered as low anxiety patients and the group was named as LA (n:20). Patients with a score of STAI-1>35 and STAI-2>35 were considered as high anxiety level patients and

the group was named as HA (n:20). 5 patients with a score of STAI-1≤35 and STAI-2>35 and 5 patients with a score of STAI-1>35 and STAI-2≤35 were excluded from the study.

Before being provided with any information about the operation (60 minutes before) patients were asked to complete the Spielberger State –Trait Anxiety Inventory Trait (STAI-T). This 20-item self- evaluation questionnaire is scored using a 4- level frequency scale, ranging from "almost never" to "almost always," reflecting different degrees of anxiety about situations that subjects perceive as threatening. The patients were subsequently informed about the surgery and postoperative recovery. Before entering the treatment room (30 minutes before), patients, by themselves and in a quiet "non-dental" room, filled out the Spielberger State-Trait Anxiety Inventory- State (STAI-S) (1). The STAI-S is a 20-item self-evaluation questionnaire, scored using a 4-level frequency scale ranging from 1 to 4. This assesses an individual's transient emotional state or condition, as characterized by subjective feelings of tension and apprehension which can fluctuate in intensity and over time. Social profile data is also taken (profession, age, gender) at the same time. [1]

All the patients were administered dexketoprofen IV. They then underwent third molar dental surgery after local anesthesia (2 ml of Jetocaine® Adeka, Istanbul, Turkey). Osteotomy, coronal section or root section was performed as required, and the wound was closed. All patients received an antibiotic (amoxicillin 500 mg /8 h for 7 days) and an analgesic/anti-inflammatory agent (275 mg naproxen sodium /8 h PO). The pain scores of patients in the postoperative period (15th minute, 30th minute, then 1st, 2nd, 4th, 6th, 8th, 12th and 24th hours) were assessed using the Visual Analog Scale (VAS). The first analgesic requirement time, total analgesic consumption, and patient and doctor satisfaction were all recorded.

Statistical Analysis

All statistical analysis was performed using SPSS 21.0 (SPSS, Inc, Chicago, IL, USA) for Windows. The data were presented as the mean ± standard deviation (SD). The distribution of data was first evaluated using the Kolmogorov-Smirnov test. The statistical significance of values for age, BMI, duration of anesthesia, and duration of surgery, which were distributed evenly among the groups, were tested by one-way analysis of variance (ANOVA). The chi-square test was used to analyse categorical variables such as gender, ASA, presence of complications, and patient satisfaction. The relationship between groups and mean VAS were assessed by the Kruskal Wallis test. The Mann-Whitney U test was used to compare groups within themselves. A value of p≤0, 05 was considered to be significant.

RESULTS

There was no significant correlation between patients' demographic data and duration of surgery (Table 1).

When the anxiety levels of the patients were evaluated, STAI-1:27±4.7 and STAI-2:30±4.3 were found in group LA. STAI-1 was 43±4.5 and STAI-2 was 42.6±5.2 in group HA.

In the study, 10 female patients and 10 male patients were found in Group LA, while in Group HA 12 female and 8 male patients were found. (p>0.05) (Table 1)

Table 1: Demographic data and duration of surgery

	Group LA (n: 20)	**Group HA (n: 20)**	**p**
Age (year)	23.5±3.2	24.5±6.7	0.27
BMI (kg/m^2)	23.2±4.6	23.3±4.2	0.98
Gender(Female / Male) (n)	10/10	12/8	0.89
ASA I / ASA II (n)	19/1	20/0	0.21
Duration of surgery (min)	11.1±4.0	12.7±5.5	0.59

(Mean value ±SD)

ASA-1 (American Society of Anesthesiologists) was found in 19 patients and ASA-2 was found in 1 patient in group LA. ASA-1 was found in 20 patients in group HA. (P=0.8)

In the LA group 8 patients did not need additional analgesic administration, while 12 patients required it. In the HA group 6 patients did not need additional analgesic, but 14 patients did require it. (p=0.8)

The average age is indicated in Table 1(p=0.27). Surgical duration was 11.1±4.0 minutes for the LA group and 12.7±5.5 minutes for the HA group. (p=0.5)

The pain scores of the patients were similar for both groups in the postoperative period. (Figure 1)

In Group LA, the first analgesic was needed 724 minutes later and the total analgesic intake was 495 mg. In group HA, the first analgesic was required after 840

minutes and the total analgesic consumption was 508 mg (p>0.05). (Table 2) When postoperative complications were evaluated, no nausea was observed in patients in Group LA. Only 1 patient in Group HA had nausea (p:0.67). Postoperative hypotension was evident in 1 patient in LA and 1 patient in HA (p:0.91). Postoperative complications such as bradycardia, allergic reaction, vomiting, tachycardia or hypertension were not observed in either group LA or group HA.

Table 2: Analgesic usage (Mean value ±SD) (Dexketoprofen 50 mg/2 ml IM)

	Group LA (n: 20)	Group HA (n:20)	p
First analgesic requirement time (min)	724.5± 612.3	840±526.6	0.293
Total analgesic requirement (mg)	495 ± 414.6	508.7±401.7	0.868

The patient satisfaction score was 3.60±0.75 for group LA and 3.60±0.75 for group HA (p:0.42). The physician satisfaction score was 3.30±0.80 in Group LA and 3.30±0.73 in group HA (p:0.47). Patient and doctor satisfaction scores were similar for both groups. (Table 3).

Table 3: Patient and doctor satisfaction (mean value ±SD)

	Group LA (n: 20)	Group HA (n:20)	p
Patient satisfaction	3.6±0.7	3.6±0.7	0.42
Doctor satisfaction	3.3±0.8	3.3±0.7	0.47

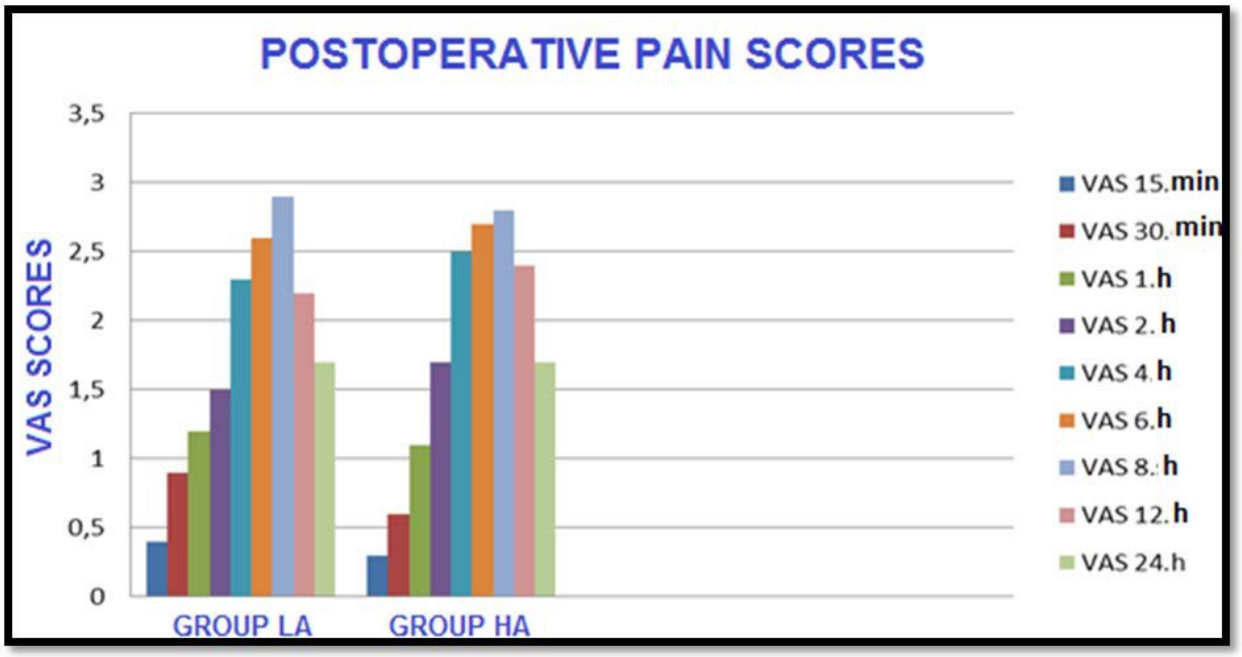

Figure 1: Postoperative VAS scores of groups

DISCUSSION

Despite the use of effective local anesthetics and analgesics in surgical procedures related to dental diseases, many patients still have dental fear. This makes surgery more difficult for patients and physicians. It can prolong the duration of the treatment and can lead to postoperative pain and other complications. Extraction of lower third molar is one of the most common procedures in oral surgery and is the most anxiety-producing condition. This anxiety may depend on the type of anesthesia, previous experiences of the patient, personality characteristics, surgical procedures and postoperative pain.

A recent study showed that anxiety influences the pain perceived by the patient during the oral surgery postoperative and the taking of painkillers. [1] Another study indicated that patients with psychological distress tend to present higher levels of dental anxiety and postoperative pain.[3]

STAI-1 and STAI-2 measure transient and continuous anxiety levels. This inventory can be applied to patients with ease. Currently, the STAI test is considered to be the golden standard.[4] The most important scale in psychology for the measurement of state anxiety and trait anxiety is the STAI scale.[7-12]

Many studies have shown that women have higher anxiety than men[6, 9,15,16] but there is no significant difference in gender distribution between the group with high anxiety and the group with low anxiety levels in this study (p>0.05).

Although most previous studies[5,7,10,13,14] showed that the level of anxiety decreased with age, no significant relationship was found between age and anxiety in our study. The average age for Group LA was 23.5±3.2 and for Group HA 24.5±6.7. In both groups patients were of a young age. Since there was no age difference between the groups, we may not have been able to find a relationship between them.

Some authors have also stated that patients showing high anxiety prior to third molar extraction can have the effect of prolonging their operation time.[4] However, in our study, we did not find a significant correlation between anxiety and duration of surgery (p>0.05).

Pre-operative anxiety was found to have no effect in our study on factors such as patient and doctor satisfaction after third molar surgery (p>0.05).

The surgical extraction of impacted mandibular third molars causes acute moderate to severe pain, and this has been demonstrated by clinical studies.[15]

After anxiety levels were measured, all patients were administered with preemptive dexketoprofen trometamol via IV. For both groups of patients we found similar pain scores across all postoperative periods. Various factors in the postoperative pain stemming from surgical extraction relate to the peripheral inflammatory reaction caused by surgical trauma. Preemptive analgesia is an antinociceptive treatment that hinders the build-up of altered processing of afferent input from sites of injury, which in turn increases postoperative pain.[16, 17]

Pre- or postoperative usage of 550 mg naproxen or 1.000 mg diflunisal orally produces considerable pain relief after surgical removal of impacted third molars. Nevertheless, no considerable differences in pain relief were found in either study between the pre and postoperative applications.[18, 19]

A study showed that ketorolac 30 mg IV produces better preventive analgesic efficacy for third molar surgery than tramadol 50 mg IV when given preoperatively. [20] There have been some studies evaluating the efficacy of dexketoprofen for dental pain.[6]

Our study is the first in which dexketoprofen trometamol was administered with the intention of providing pre-emptive analgesia for patients undergoing third molar dental surgery, after evaluation of their anxiety levels. The pre-emptive attributes of dexketoprofen trometamol have been examined in previous studies, but the effect of anxiety level on postoperative pain after third molar dental surgery was not evaluated. In both groups we found pain levels to be similar in all periods. This shows that the administration of pre-emptive dexketoprofen trometamol on patients undergoing third molar dental surgery is an effective agent in pain control, but anxiety has no effect on post-operative pain in relation to to third molar dental surgery.

We did not find any difference between the LA group and the HA group in terms of post-operative pain and analgesic consumption. This indicates that preoperative anxiety before third molar dental surgery is not so intense as to have an effect on post-operative pain.

Our study shows that anxiety level has no effect on third molar dental surgery pain when an effective analgesic is administered before the pain mechanism is triggered, and patients' pain levels are controlled at frequent intervals.

The classification of third molar impaction plays a pivotal role in the overall assessment of dental surgical procedures and is intrinsically linked to patient anxiety levels. The degree of impaction, as categorized by established classifications such as Pell and Gregory or Winter, not only determines the complexity of the surgical intervention but also contributes significantly to the patient's psychological response. Higher degrees of impaction, involving more intricate surgical techniques, may evoke increased levels of anxiety in patients facing the prospect of third molar extraction. Therefore, adding the classification of impacted wisdom teeth to similar studies and increasing the number of patients may yield more meaningful results.

CONCLUSION

Although tooth extraction is generally thought to create a high level of fear in the community, our study shows that levels of preoperative anxiety before third molar dental surgery are not so great as to have an effect on post-operative pain. By providing effective analgesia and observing patients' pain levels frequently, a comfortable postoperative period can be assured following third molar dental surgery.

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