

# Preemptive Tramadol and Meperidine for Postoperative Analgesia

## POSTOPERATİF ANALJEZİDE PREEMPTİF TRAMADOL VE MEPERİDİN

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### Summary

*Pretreatment with opioid analgesics, nonsteroidal antiinflammatory agents and local anesthetics has been used for preemptive analgesia. In our study, we aimed to compare the preemptive analgesic effects of intravenous single dose tramadol and meperidine with control group.*

*The patients in group T received 50 mg tramadol, in group M received 50 mg meperidine and in control group received 0.9% NaCl via intravenous route, immediately before induction of anesthesia. Postoperative pain were evaluated by visual analog scale (VAS, 0-10 cm) and verbal pain scale (VPS). The scores of pain in group T and M were significantly lower than control group ( $p < 0.05$ ). Also total analgesic consumption for 24 hour in control group was significantly higher than preemptive groups ( $p < 0.05$ ).*

*Preemptive analgesia with tramadol and meperidine were found to be effective on postoperative pain.*

**Key Words:** Tramadol, Meperidine, Preemptive analgesia

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Under general anesthesia, the spinal cord is lightly anesthetized and receives massive afferent nociceptive input from the site of surgery. Under regional anesthesia, the spinal cord receives no nociceptive transmission. It has been hypothesized that preemptive analgesia can prevent nociceptive input within the spinal cord.

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### Özet

*Opioid analjezikler, nonsteroid antiinflamatuvar ilaçlar ve lokal anesteziyer preemtif analjezi amacıyla kullanılmaktadır.*

*Çalışmamızda, T grubundaki hastalara 50 mg tramadol, M grubundaki hastalara 50 mg meperidin ve kontrol grubundaki hastalara da % 0.9 NaCl, induksiyondan önce iv. olarak verildi. Postoperatif ağrı, vizüel analog skala (VAS, 0-10 cm) ve verbal ağrı skoru (VPS) ile değerlendirildi. Bu ağrı skorları, grup T ve M'de, kontrol grubuna göre belirgin olarak düşüktü ( $p < 0.05$ ). Kontrol grubundaki 24 saatlik toplam analjezik tüketimi de, preemtif çalışma gruplarına göre yüksekti ( $p < 0.05$ ).*

*Sonuç olarak, postoperatif ağrının önlenmesinde, tramadol ve meperidin ile preemtif analjezi etkili bulunmuştur.*

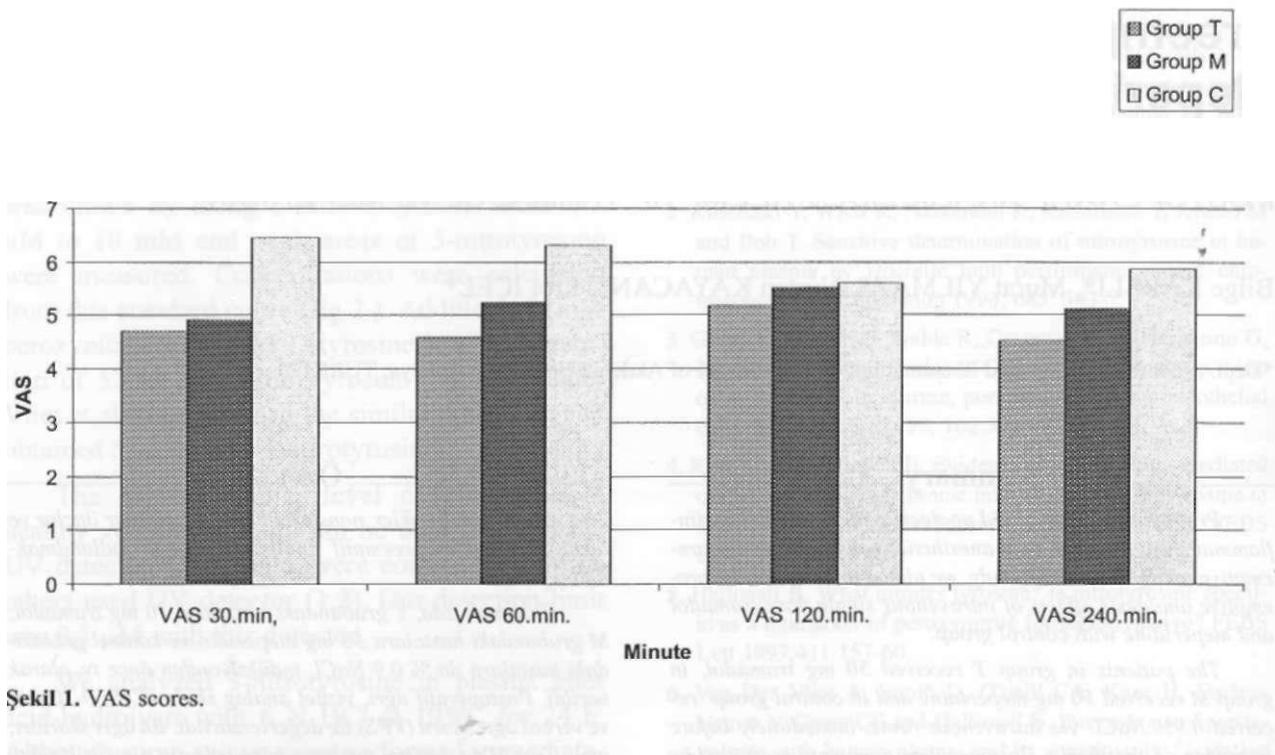
**Anahtar Kelimeler:** Tramadol, Meperidin, Preemtif analjezi

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Pretreatment with opioid analgesics, nonsteroidal antiinflammatory agents and local anesthetics had been used for preemptive analgesia. The aim of this double-blind and randomized study was to compare the preemptive analgesic effects of intravenous single dose tramadol and meperidine with control group.

### Material and Methods

This study was performed on 45 female patients (ASA I-II) undergoing elective lower abdominal and orthopaedic surgery after approval of the faculty ethical committee. In a randomised and double-blind study, all patients were allocated randomly into three groups. The patients, in group T (n=15) received 50 mg tramadol (1ml), in group M (n=15)



received 50 mg (1ml) meperidine and in control group (n=15) received 1ml 0.9% NaCl intravenously, immediately before induction of anesthesia. All patients received standard anesthetic procedure. Anesthesia was induced with 5mg.kg<sup>-1</sup> tiopenthal, 0.1mg.kg<sup>-1</sup> vecuronium and maintained with 33% O<sub>2</sub>, 66% N<sub>2</sub>O plus 1% isoflurane. Opioid analgesic (fentanyl) was not given during the maintenance of anesthesia. Systolic and diastolic blood pressure, pulse rates and peripheric oxygen saturations were measured to intraoperative and postoperative period. These data were recorded after and before experimental drugs, after induction of anesthesia, immediately after skin incision, 30th, 60th, 90th and 120th min, end of the surgery and anesthesia during the intraoperative period. The haemodynamic measurements were recorded in postoperative period, 30th, 60th min, 2nd and 4th hours. The anesthesists who was blinded about which drug was given, assessed pain. Patients evaluated their pain using a visual analogue scale (VAS) of 10 cm and verbal pain scale (VPS) of five points. VAS and VPS values were recorded 30th and 60th min, 2nd and 4th hours postoperatively. In the patients, which had higher values of VAS than 5 and higher

**Table 1.** Characteristics of study groups

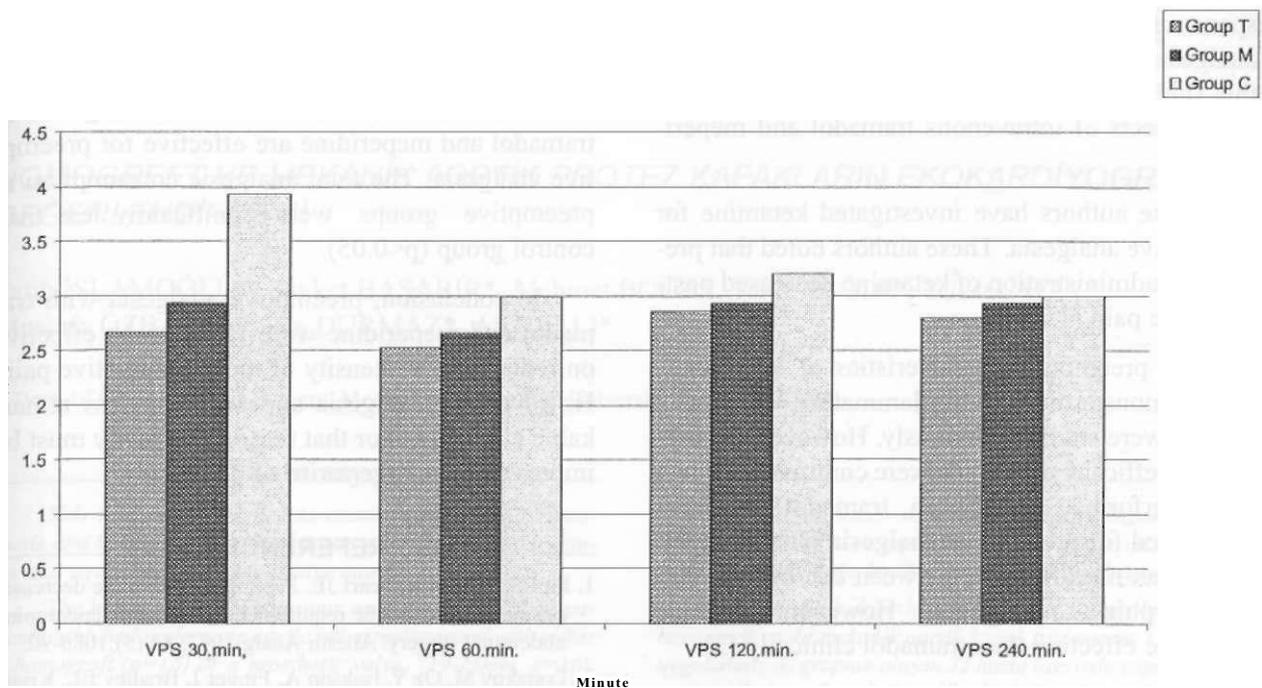
	Group T	Group M	Group C
Age	46.0±10.9	45.3±12.7	45.4*11.7
Duration of surgery	148.0±17.8	148±17.9	150.0±19.6
Duration of anesth.	159.6±19.6	158.6±17.7	159.0±18.4

values of VPS than 3 were given meperidine 25 or 50 mg i.m. Pain, time to first postoperative analgesic, analgesic consumption, vital signs and side effects were recorded postoperatively for 24 h.

Statistical analysis were performed with One Way ANOVA and P<0.05 was taken as significant.

### Results

There were no significant differences between the groups in demographic data or duration of surgery and anesthesia (p>0.05) (Table 1). There were no statistically significant differences in haemodynamic measurements between the groups during the pre-, peri- and post-operative periods (p>0.05).



Şekil 2. VPS scores.

The pain scores in group T and M were significantly lower than the control group. VAS values in control group at 30th and 60th min and 4th hour were significantly higher than group T and M ( $p < 0.05$ ). VAS values of 30th min were 6.46 ( $p < 0.05$ ,  $p = 0.0001$ ) in control group, 4.73 in group T and 5.13 in group M. VAS of 4th hour were 4.53 and 5.13 in groups T and M and 5.86 in control group. VAS values at 60th min were significantly higher in control group (6.33) than group T (4.60) and M (5.26) ( $p < 0.05$ ,  $p = 0.0001$ ) (Figure 1). VAS values of the groups at 120 min was not significantly different.

VPS values of 30th and 60th min and 120th min were significantly lower in group T and M ( $p < 0.05$ ) (Figure 2).

The time of first postoperative analgesic requirement was lower in control group (46.6 min.) ( $p < 0.05$ ,  $p = 0.0001$ ). The time of first postoperative analgesic requirements were 113.6 min. in group T, 112.6 min. in group M. Total analgesic consumption for 24 hours in control group (70.0mg) was significantly higher than the other two groups (56.6 mg in group T, 58.3 mg in group M) ( $p < 0.05$ ).

There was no difference between the use of tramadol and meperidine in total analgesic consumption ( $p > 0.05$ ). Opioid related side effects were not recorded during the intraoperative and postoperative period.

### Discussion

The importance of peripheral and central modulation in nociception has fostered the concept of "preemptive analgesia" in patients undergoing surgery. This may involve infiltration of the wound with local anesthetic, central neural blockade or the administration of effective doses of opioids, nonsteroidal antiinflammatory drugs or other anesthetic drugs.

Opioids are widely used in anesthesia, to provide analgesia during and after surgery. Tramadol, a Mu-receptor agonist and serotonin agonist is widely used in the treatment of postoperative pain. Meperidine, an opioid analgesic drug, is a popular analgesic in adults.

Postoperative pain relief following surgery is a big organizational problem. The concept of preemptive analgesia depends on the base that the re-

sponse to nociceptive stimulus may be reduced by analgesics before the painful stimulus. The aim of this study was to investigate the preemptive analgesic effects of intravenous tramadol and meperidine.

Some authors have investigated ketamine for preemptive analgesia. These authors noted that preemptive administration of ketamine decreased postoperative pain (1,2).

The preemptive characteristics of local anesthetics, nonsteroidal antiinflammatory drugs and opioids were studied previously. However, the preemptive efficacy of opioids were controversial. In a study performed by Naguib, tramadol and morphine used for preemptive analgesia intravenously. There was no difference between use of tramadol and morphine to treat pain. However, morphine was more effective than tramadol clinically (3).

On the other hand, the study shows that preemptive epidural morphine is superior to epidural morphine given postoperatively for pain relief (4).

In our study, patients received tramadol, meperidine and placebo intravenously, immediately before induction of anesthesia. Our results showed that tramadol and meperidine were decreased postoperative pain compared to placebo ( $p < 0.05$ ). The pain scores in preemptive groups were significantly lower than the control group ( $p < 0.05$ ).

Preclinical studies in experimental animals with local anesthetics and opioids suggest that preemptive analgesia may improve postoperative pain management (5,6).

Some investigators have studied with local anesthetics for preemptive analgesia on postoperative analgesia (7-9). In a study, the preemptive administration of bupivacaine decreased postoperative pain (10). Also, Pasqualucci and Brennan reported that postoperative pain and analgesic consumption were lower with local anesthetic before and after surgery (5,8).

In a study performed by Kundra, preemptive caudal bupivacaine was evaluated for postoperative analgesia in children. In that study, author was re-

ported that preemptive caudal bupivacaine was effective for pain relief (10).

Our results showed that narcotic analgesics as tramadol and meperidine are effective for preemptive analgesia. The total analgesic consumption in preemptive groups were significantly less than control group ( $p < 0.05$ ). /

In conclusion, preemptive analgesia with tramadol and meperidine were found to be effective on reducing the intensity of the postoperative pain. However, the analgesia appears to be less remarkable clinically. For that reason, our study must be improved by a large series of patient.

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