

Comparison of Postoperative Analgesia Efficacy of Preemptive Intravenous Ibuprofen and Paracetamol in Endovenous Laser Ablation Under General Anesthesia

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Genel Anestezi Altında Endovenöz Lazer Ablasyonunda Preemptif İntravenöz İbuprofen ve Parasetamolün Postoperatif Analjezi Etkinliğinin Karşılaştırılması

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Öz

Amaç: Venöz yetmezlik tedavisinde endovenöz teknikler çok sık uygulanmaktadır. Bu çalışmanın amacı, genel anestezi altında endovasküler lazer ablasyon uygulanacak hastalarda preemptif intravenöz ibuprofen ve parasetamolün akut ağrı skorları, opioid tüketimi ve hasta memnuniyeti üzerine etkilerini karşılaştırmaktır.

Yöntem: İndüksiyondan sonra Grup P'de 1 g Parasetamol ve Grup I'de 800 mg Ibuprofen ayrı bir intravenöz yolla yavaş infüzyon olarak uygulandı. Her 2 ilaç taburculuğa kadar 6 saatte bir yinlendi. Ağrı şiddeti için PACU'da ve ameliyat sonrası 1., 2. ve 6. saatlerde vizüel analog skala (VAS) kullanıldı. Akut ağrı durumunda (VAS \geq 40) tedavi amaçlı 1 mg intravenöz morfin uygulandı. Taburculuk öncesi VAS skorları, hastanede kalış süresi, toplam opioid tüketimi ve hasta memnuniyeti değerlendirildi.

Bulgular: Toplam 82 hasta (Grup P'de 42 ve Grup I'de 40) dâhil edildi. VAS skorları arasında fark yoktu. Toplam morfin tüketimi Grup P'de $0,33\pm 0,47$, Grup I'de $0,30\pm 0,43$ idi ($p=0,42$). Hastanede kalış süresi Grup P'de $6,4\pm 1,7$ saat, Grup I'de $6,2\pm 1,4$ saat idi ($p=0,51$). Taburculukta değerlendirilen hasta memnuniyet durumu benzer bulundu.

Sonuç: Genel anestezi altında EVLA uygulanan hastalarda preemptif intravenöz parasetamol ile ibuprofen arasında postoperatif akut ağrı skorları ve opioid tüketimi açısından fark yoktur. Bu tip ameliyatlarda her iki ilaç da güvenle uygulanabilir.

Anahtar kelimeler: EVLA, analjezi, parasetamol, ibuprofen

ABSTRACT

Objective: Endovenous techniques are applied very frequently in the treatment of venous insufficiency. The aim of this study is to compare the effects of preemptive intravenous ibuprofen and paracetamol on acute pain scores, opioid consumption and patient satisfaction in patients who will undergo endovascular laser ablation under general anesthesia.

Methods: After induction, 1 g Paracetamol for Group P or 800 mg Ibuprofen for Group I was administered as a slow infusion by a separate intravenous route. Both drugs were followed by a repeat dose every 6 h until discharge. Visual analogue scale (VAS) was used for pain intensity at PACU and after the first, second, sixth hour after surgery. In case of acute pain (VAS \geq 40) 1 mg intravenous morphine was used as a rescue drug. VAS scores, length of stay, total opioid consumption and patient satisfaction status was evaluated before discharge.

Results: A total of 82 patients (42 in Group P and 40 in Group I) were included in the study. There was no difference between the VAS scores. Total morphine consumption was 0.33 ± 0.47 mg in Group P, and 0.30 ± 0.43 mg in Group I ($p=0.42$). Hospital length of stay was 6.4 ± 1.7 hours in Group P and 6.2 ± 1.4 hours in Group I ($p=0.51$). Patient satisfaction status evaluated at discharge was found to be similar between groups.

Conclusion: There is no difference between preemptive intravenous paracetamol and ibuprofen in patients undergoing EVLA under general anesthesia in terms of postoperative acute pain scores and opioid consumption. Both drugs can be safely applied in this type of surgery.

Keywords: EVLA, analgesia, paracetamol, ibuprofen

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INTRODUCTION

Varicose veins are a very common disease with a prevalence of up to 20% in men and > 25% in women.^[1] In addition to ligation techniques, the frequency of application of endovenous treatment modalities in suitable patients is increasing day by day. Laser techniques that described in the early 90s, have gained considerable popularity since then^[2,3]. Nowadays, laser and radiofrequency ablation techniques have become the gold standard in endovenous treatment.

Mild or moderate acute postoperative pain may occur after endovascular laser ablation, which can be applied under different anesthesia techniques such as conscious sedation, general anesthesia, and regional anesthesia in addition to tumescent anesthesia^[4]. Opioids and nonsteroidal anti-inflammatory drugs (NSAID) combinations are still indispensable components of multimodal analgesia for the relief of acute postoperative pain arising in this type of surgery. Since opioid side effects may cause undesirable results in this procedure, which is mostly performed as an outpatient surgery, practices aimed at reducing opioid use will increase patient satisfaction.

In the light of this information, the primary outcome of this study is to compare the effects of intravenous ibuprofen and paracetamol to be administered preemptively on acute pain scores and opioid consumption until discharge in patients who will undergo endovascular laser ablation under general anesthesia. The secondary outcome is to compare opioid side effects and patient satisfaction.

MATERIALS and METHODS

After the institutional ethics committee approval and written informed consent, ASA (American Society of Anesthesiology) physical status I-II patients who underwent endovascular laser ablation under general anesthesia between January and December 2020 were included in the study, retrospectively. Patients with hepatic or renal dysfunction, body mass index over 30 kg/m², allergies to medications to be used, and those who could not cooperate adequately during pain assessment were excluded. All patients were informed about pain assessment scales before surgery.

Routine monitoring techniques (ECG, peripheral oxygen saturation, noninvasive blood pressure) were applied to patients who were transferred to the operating room without any premedication. Anesthesia was induced with 1 mg/kg lidocaine, 3 mg/kg propofol, and 1 mcg/kg remifentanyl, then laryngeal mask airway inserted. After induction, 1 g Paracetamol (Partemol, Vem Ilac, Ankara, Turkey) for Group P or 800 mg Ibuprofen (Intrafen, Gen Ilac, Istanbul, Turkey) diluted in 100 mL saline for Group I was administered as a slow infusion over 5-10 minutes by a separate intravenous route. Both drugs were followed by a repeat dose every 6 h until discharge. Anesthesia was maintained with 2-3% sevoflurane in 2 liter of fresh gas flow with 50% O₂ and 50% air. Afterward, a 6F intraducer was inserted by performing great saphenous vein puncture at knee level under ultrasound guidance in the reverse Trendelenburg position. After the tip of the laser fiber is placed 1-2 cm below the saphenofemoral junction, perivenous tumescent anesthesia (1000 ml 0.9% saline, 50 ml lidocaine 2%, 1 ml Epinephrine 1:1000, 10 mEq NaHCO₃) was applied under ultrasound guidance. Laser energy was applied in continuous mode by withdrawing the sheath intermittently. Surgery was terminated after the required phlebectomies was performed.

Visual analogue scale (VAS) from 0 to 100 (0 = no pain and 100 = the worst pain imaginable) was used for self-assessment of postoperative pain intensity after patients are awakened. In case of acute pain (VAS ≥ 40) 1 mg intravenous morphine was used as a rescue drug. Patients under observation in the post anesthesia care unit were transferred to the surgical ward if VAS scores were under 40 and modified Aldrete scores were over 8.

Morphine requirement and VAS scores were monitored hourly until discharge. Patients were followed up for nausea, vomiting, itching, dyspepsia, headache, sedation, respiratory depression, and pulmonary complications. Patient satisfaction status was evaluated before discharge (1, unsatisfied; 2, satisfied; 3, very satisfied).

Statistical analysis was performed using IBM SPSS 20.0 software. Distribution of data was carried out using the Kolmogorov-Smirnov test. Categorical data

were compared between groups using the Pearson χ^2 test. The one-way ANOVA followed by Tukey's tests was used to check differences among groups, at a significance level of 5% for normally distributed continuous variables. Descriptive statistics was expressed as a mean \pm SD.

RESULTS

A total of 82 patients, 42 in Group P and 40 in Group I, were included in the study. No difference was found between the groups regarding age, gender, body mass index, comorbidities, and ASA status of the patients. As surgical data heart rate, mean arterial pressure, anesthesia duration, surgery time, and intraoperative remifentanyl consumption were similar. In addition, there was also no difference in time spent in the PACU and modified Aldrete scores (Table 1).

3 patients in Group P and 2 patients in Group I needed 1 mg of morphine in the recovery room before they were transferred to the surgical ward. There was no difference between the VAS scores evaluated at the postoperative first, second, sixth hour and discharge for both groups. Total morphine consumption during discharge was determined as 0.33 \pm 0.47 in Group P, and 0.30 \pm 0.43 in Group I ($p=0.42$) (Table 2). Nausea, vomiting, itching, dyspepsia, headache, sedation, respiratory depression, and pulmonary complications were not detected in any patient.

Hospital length of stay was 6.4 \pm 1.7 hours in Group P and 6.2 \pm 1.4 hours in Group I ($p=0.51$). One patient in each group spent a night in the hospital of their own accord. Patient satisfaction status evaluated at discharge was found to be similar (Table 3).

Table 1. Demographic and surgical data (mean \pm standard deviation).

	Group P (n=42)	Group I (n=40)	p
Age (year)	49.9 \pm 12.1	51.6 \pm 11.7	0.36
Gender (female/male)	25/17	22/18	0.44
BMI (kg/m ²)	26.3 \pm 5.2	25.8 \pm 7.9	0.28
ASA status (I/II)	24/18	24/16	0.59
Preoperative comorbidities (%)			
Hypertension	8 (19)	7 (17.5)	0.18
Diabetes mellitus	5 (11.9)	4 (10)	0.39
Coronary artery disease	3 (7.1)	3 (7.5)	0.61
OSAS	2 (4.7)	2 (5)	0.29
Duration of anesthesia (min)	42.1 \pm 12.2	44.3 \pm 11.8	0.33
Duration of surgery (min)	39.7 \pm 13.4	41.5 \pm 10.9	0.42
Intraoperative remifentanyl consumption (μ g)	279.7 \pm 28.9	268 \pm 32.4	0.22
Time spent in PACU (min)	22.3 \pm 9.8	21.5 \pm 10.2	0.41

BMI: body mass index; OSAS: Obstructive sleep apnea syndrome; PACU: Post anesthesia care unit

Table 2. Visual analog scale (VAS) scores [0-100], and total morphine consumption (mg).

	Group P (n=42)	Group I (n=40)	p
VAS scores			
At PACU	12 \pm 3.1	11 \pm 2.6	0.32
1st hour	16 \pm 5.2	13 \pm 4.6	0.28
2nd hour	22 \pm 4.8	16 \pm 3.3	0.11
6th hour	12 \pm 2.1	10 \pm 2.7	0.35
Discharge	12 \pm 2.4	11 \pm 3.1	0.29
Total morphine consumption (mg)	0.33 \pm 0.47	0.30 \pm 0.43	0.42

PACU: Post anesthesia care unit

Table 3. Hospital length of stay, and patient satisfaction (1, unsatisfied; 2, satisfied; 3, very satisfied).

	Group P (n=42)	Group I (n=40)	p
Hospital length of stay (hours)	6.4±1.7	6.2±1.4	0.51
Patient satisfaction (1/2/3) (n)			
At PACU	1/16/25	1/17/22	0.31
At surgical ward	1/14/27	1/12/27	0.29
During discharge	1/11/30	1/9/30	0.48

PACU: Post anesthesia care unit

DISCUSSION

There was no significant difference between intravenous ibuprofen and paracetamol administered preemptively on acute pain scores and opioid consumption until discharge in patients who will undergo endovascular laser ablation under general anesthesia. In addition, while no opioid side effects were observed, patient satisfaction status were similar.

Many treatment methods are used in venous insufficiency, which is almost 25% in both sexes. In addition to the surgical techniques applied for many years, endovenous techniques have been used more widely in recent years. Although there are many studies comparing these techniques, it has been shown that there is no significant difference in long-term results. Lawaetz et al. compared endovenous ablation techniques, foam sclerotherapy and surgical stripping techniques. As a result, they stated that there was no difference between EVLA and stripping in long term follow up [5]. At the same time, Pan et al. also revealed in their meta-analysis that there was no difference between stripping and EVLA in two-year follow-up results [6]. In the comparison of different laser types, Doganci and Demirkilic reported that they achieved less pain and a better venous clinical severity scores with 1470 nm laser and radial fiber compared to 980 nm laser and bare-tip laser [7]. It is also known that after EVLA, the pain scores of the patients decrease and their satisfaction increases [8]. In this study, we evaluated pain and satisfaction levels after EVLA performed last year using a 1470 nm laser type under general anesthesia.

This surgical procedure can be done by applying different types of anesthesia. It can be performed under sedoanalgesia or by adding NO inhalation to

tumescent anesthesia in outpatient clinics [9]. In addition, neuraxial blocks, peripheral nerve blocks and general anesthesia are also applied in operating room applications, considering both surgeon and patient wishes [4,10]. Arun et al. reported that general anesthesia applied with laryngeal mask can be used safely in these patients [11]. In our study, the effects of two different analgesic agents on patients' pain scores and opioid consumptions undergoing general anesthesia upon the request of the patient or surgeon were compared.

Postoperative acute pain can be detected in patients who underwent EVLA despite tumescent anesthesia and this can seriously impair patient comfort and satisfaction. Although there are many agents that can be used to reduce these complaints, opioids are not the most preferred drugs in outpatient surgery considering their side effects. In addition to intravenous paracetamol, which is frequently used in our country in recent years, intravenous ibuprofen as a NSAID that can be used preemptively, has also started to be used. Yalçınlı et al. stated that intravenous ibuprofen is more effective than paracetamol in soft tissue injuries in patients admitted to emergency department [12]. On the other hand, Erdogan Kayhan et al. showed that intravenous ibuprofen did not change the opioid consumption compared to paracetamol, but it reduced the severity of pain in patients who had bariatric surgery [13]. Çelik et al. stated that ibuprofen was more effective in the first 12 hours in patients who underwent septorhinoplasty, but there was no difference between the two agents afterwards [14]. There is no data on the use of these two agents in EVLA procedures, which are used to prevent or reduce the use of opioids in many lesions and surgical procedures. Both the less tissue damage during EVLA and using tumescent anesthesia may

have caused no difference between these two agents in our study. However, the need for additional analgesics in some patients despite these medications indicates that the pain is a subjective experience and patient-based treatment methods should be used.

This study contains some limitations. First of all, the evaluation is retrospective and does not involve any randomization. Secondly, the small sample size in a single center might have caused no significant difference between these two drugs. Third, it could not be evaluated whether there is any difference in pain scores after discharge. Prospective, randomized, double-blind, multicenter studies are needed to achieve more effective results.

CONCLUSION

There is no difference between preemptive intravenous paracetamol and ibuprofen in patients undergoing EVLA under general anesthesia in terms of postoperative acute pain scores and opioid consumption. Both drugs can be safely applied in this type of surgery.

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