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Research Article

Nausea Management after Analgesia with Ketorolac and Morphine: Case Study of Septorhinoplasty Patients

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Abstract:

Introduction: Patients undergoing plastic surgery are at increased risk for PONV. This complication may have disastrous effects such as hematoma or suture disruption and destroy the desired aesthetic result. The present study was conducted with the aim of investigating and comparing the rate of postoperative nausea in patients receiving ketorolac and morphine, and undergoing septorhinoplasty surgery.

Materials and methods: This study is a double-blind randomized clinical trial that was conducted during a six-month period from March 2021 to August 2022 in 180 patients referred to the operating room of Motahari Hospital in Jahrom city who underwent septorhinoplasty surgery. , Done. Patients were randomly divided into three groups: 15 mg/kg morphine and 30 and 60 mg ketorolac. Information collection tools include; Age, gender and degree of nausea after the operation.

Results: The studied groups are similar in terms of age, sex and demographic characteristics. In terms of nausea, Fisher's statistical test showed that patients in the group receiving 6 mg of morphine felt nausea, which was statistically significant (P=0.035). No person in the group receiving ketorolac 60 mg and ketorolac 30 mg experienced nausea.

Conclusion: Based on the results of the present study, the use of doses of 30 and 60 mg of ketorolac, unlike morphine, did not cause nausea in septorhinoplasty patients receiving this drug.

Keywords: ketorolac, morphine, postoperative nausea, septorhinoplasty

ntroduction

Septorhinoplasty is the most common plastic surgery in Iran (1). The rate of septorhinoplasty in Iran is 180 cases per 100,000 patients (2). The incidence of PONV in plastic surgery patients ranges from 38 to 48% and may increase to 80% in high-risk surgical patients (3-7). Patients undergoing facial surgery, including rhytidectomy, platysmaplasty, and rhinoplasty, are at increased risk for PONV. This complication, especially in plastic surgery, may have disastrous effects such as hematoma or suture disruption and destroy the desired aesthetic result (5-6). In addition, nose surgery is usually performed as a common outpatient procedure, and the first three days after septoplasty and rhinoplasty surgery are associated with significant pain, and careful attention and

control of painkillers are necessary (8). The use of opioid painkillers is very effective in controlling pain in these patients (9). On the other hand, the use of opioid substances has increased the risk of nausea, vomiting and respiratory depression in some studies (10). Therefore, with the reporting of these side effects, NSAIDs have been used in different clinical environments to reduce pain and inflammatory reactions (11). In addition, NSAID use may be associated with a reduced risk of opioid-related side effects, including nausea, vomiting, and sedation (12-15). Ketorolac is a non-steroidal anti-inflammatory drug that is available orally and by injection. The half-life of this drug has been reported as 2.4-8.6 hours and it is extensively metabolized in the liver and excreted through the kidneys (16). In addition, this drug has nothing to do with patients' tolerance, breathing problems, nausea and vomiting, urinary retention or conditions caused by the use of opioid painkillers (17-18). Therefore, according to the mentioned cases and the lack of studies done in connection with the effects of septorhinoplasty surgery and opioid substances used in this surgery on the occurrence of postoperative nausea in these patients, the present study aims to investigate and compare the postoperative nausea rate in the patients receiving ketorolac and morphine underwent septorhinoplasty surgery.

Method:

The current study is a randomized double-blind clinical trial that was conducted during a six-month period from March 2021 to August 2022 in patients referred to the operating room of Motahari Hospital in Jahrom city who underwent septorhinoplasty surgery. Inclusion Criteria: All patients over 18 years old, hemoglobin above 10, normal INR/PTT/PT, normal hemodynamics and heart rate above 60 beats per minute. Exclusion Criteria: drug addiction, history of asthma, gastrointestinal discomfort, underlying cardiovascular disease, patients with coagulation disorder, patients with a history of kidney failure, serum creatinine more than 1.5, heavy bleeding, are excluded from the study. The sample size was determined by assuming the standard difference = 85.0 and confidence limits of 95% and power = 80%, and assuming equal number of samples in each group using Altman's normogram and including 15% dropout, was 60 patients . The samples were randomly assigned to study groups (60 patients in each group) using a coin toss. Subjects were randomly assigned to three groups receiving 15 mg/kg morphine, 30 mg ketorolac and 60 mg ketorolac based on the conditions of entry into the study and no exclusion conditions. Sampling was done until three groups were matched in terms of basic characteristics. All anesthetic drugs were the same in all three groups (at the time of anesthesia induction and its maintenance). Medicines from all three groups were injected after induction of anesthesia. The checklist designed by the researcher includes; Age, gender and degree of nausea after septorhinoplasty surgery. The amount of nausea was measured immediately after the operation in recovery, 2 and 4 hours after the operation. Data analysis was done using spss software version 21 and descriptive (mean and standard deviation) and inferential (Fisher) statistical tests at a significance level of 0.05.

Ethical Considerations: This study was approved by the ethics committee of Jahrom University of Medical Sciences under the code of ethics IR.JUMS.REC.1400.043. Also, this study has been registered in the Clinical Trial Center of Iran with the code "IRCT20210415050976N8".

Result:

In this study, 60 patients were examined in each of the groups receiving 6 mg of morphine, 30 mg of ketorolac and 60 mg of ketorolac. According to Table 1, the average age of patients in the group receiving 6 mg of morphine is 30.08 ± 8.65 years; in the group receiving 30 mg ketorolac, it was 29.62±8.41 years,

Table 1. Distribution of nausea experience in patients participating in the study

		With Nausea and vomiting	Without Nausea and vomiting	P-Value
Morphine 0.15 mg/kg	n	3	57	0.035
	%	5	95	
Ketorolac 30 mg	n	0	60	
	%	0	100	
Ketorolac 60 mg	n	0	60	
	%	0	100	

and in the group receiving 60 mg ketorolac, it was 27.33±8.18 years. There was no significant difference between the study groups in terms of age (P=0.14). In terms of gender, 67.22% of the participants were male and 32.77% were female. The distribution of the number of men and women in the study groups was not significantly different (P=0.80).

According to Table 1, in terms of nausea, Fisher's statistical test showed that patients in the group receiving 6 mg of morphine felt nausea, which was statistically significant (P=0.035). No person in the group receiving ketorolac 60 mg and ketorolac 30 mg experienced nausea.

Discussion:

Septorhinoplasty is one of the most precise, delicate and difficult plastic surgeries, but it may be associated with complications like any other surgery (19-21). The present study was conducted with the aim of investigating and comparing the rate of postoperative nausea in patients receiving ketorolac and morphine, and undergoing septorhinoplasty surgery. 180 patients undergoing septorhinoplasty surgery were divided into three groups: morphine, ketorolac 60 mg and ketorolac 30 mg. The studied groups are similar in terms of age and gender demographic characteristics. The distribution of the experience of nausea among the participants in this study shows that only the group receiving 6 mg of morphine had nausea, which was statistically significant (P=0.035). And no person in the group receiving ketorolac 60 mg and ketorolac 30 mg had nausea. Abdoli et al. (2018) compared the effects of ketorolac and morphine in pain control in spinal trauma patients in the emergency department. In the morphine group, 34.8% of patients and in the ketorolac group only 1.2% of patients reported nausea during the study (p<0.001). (22). In another study that evaluated the effects of ketorolac and gabapentin on post-operative analgesia in orthognathic surgeries, the results showed that ketorolac, similar to gabapentin, can reduce the intensity of pain and the need for narcotics with less incidence of nausea and vomiting after jaw surgery reduce the face (23). Akbari et al. (2017) also compared the effects of ketorolac and intravenous acetaminophen in reducing pain and narcotic consumption after surgery in patients undergoing orthopedic surgery of the lower limbs and reported that the rate of nausea and vomiting in the ketorolac infusion group was significant. It was less than the group receiving intravenous acetaminophen (24). Vlajkovic et al also stated in their study that the administration of ketorolac before surgery reduces the amount and severity of postoperative nausea and vomiting (25), which findings are consistent with the results of the present study. However, other studies have reported different results. Saryazdi et al. (2017) compared the effect of administration of two intravenous Preemptive, ketorolac and paracetamol, on analgesia after abdominal surgery. According to the reported results, the incidence of nausea and vomiting was significantly higher in the

ketorolac group (26), which is not consistent with the results of the present study. One of the reasons for this difference is the type of surgery. The most commonly reported side effects associated with ketorolac include nausea, vomiting, dyspepsia, inhibition of platelet aggregation, gastrointestinal (GI) bleeding, allergic reactions, lightheadedness, and drowsiness, similar to other NSAIDs (27,28). The risk of these complications increases with higher doses, especially in case of gastrointestinal bleeding (29). However, in the present study, no complication related to increased nausea was observed in the Ketorolac group, even with increasing the dose of this drug.

Conclusion:

Based on the results of the present study, the use of doses of 30 and 60 mg of ketorolac, unlike morphine, did not cause nausea in septorhinoplasty patients receiving this drug.

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Authors Contributions:
Seyed Ebrahim Sadeghi contributed to the data analysis and interpretation. Reza Sahraeai and Mohammad Sadegh Sanie Jahromi provided critical feedback and helped to shape the research. Navid Kalani assisted with data collection and analysis. Mojtaba Ghaedi contributed to the literature review and writing of the manuscript. Mojtaba Sohrabpour oversaw the project and provided guidance throughout the research process.

Conflict of interest:
There are no conflicts of interest in this study.

Research funding: None.

Ethical consideration:
This study was approved by ethics in research committee with a code of: IR.JUMS.REC.1400.043

Data availability:
No data are available for this review study.

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