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Original Research Article

Evaluation of the Effectiveness of Oral Tizanidine in Reducing Pain after Septoplasty

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ABSTRACT

Tizanidine is an alpha-2 agonist used as a muscle relaxant that acts through the central nervous system. The most commonly used uses of tizanidine are muscle spasm relief, prophylaxis of chronic headaches, spasticity treatment, and anesthesia prodrug. The aim of this study was to determine the effectiveness of tizanidine as a prodrug in reducing pain after septoplasty surgery. This descriptive cross-sectional study was performed during the two years 2018-19 with the participation of 100 patients who were candidates for septoplasty surgery in the hospitals of Tabriz University of Medical Sciences. Some patients were given tizanidine tablets two hours before surgery and others were not given any medication; Pain intensity was compared between the two groups using t-test using visual acuity scale during the first 24 hours. Comparison of pain intensity during the first six hours after the study showed that pain intensity in patients taking tizanidine was significantly lower than in the group who did not use the drug; Comparison of pain intensity from 6 hours to 24 hours after surgery showed that there was no statistically significant difference between the two groups participating in the study. The use of acetaminophen tablets to control pain after surgery also showed that there was no statistically significant difference between the two groups participating in the study**.**Pain after septoplasty surgery is known as moderate pain; Its control and management is very important for patients and the health team. In this study, it was found that the use of tizanidine tablets can be useful in controlling pain in the early hours after surgery; But long-term rejection has no beneficial effect.

Keywords: Septoplasty, Postoperative Pain, Tizanidine

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Introduction

One of the major concerns of patients is postoperative pain, which can delay the onset of recovery and increase the length of stay of patients in the hospital. Proper postoperative pain relief improves the patient's quality of life and speeds up early movement after surgery, leading to shorter hospital stays and lower financial costs (1). Septoplasty is a common operation in the ear, nose and throat area. This surgery causes nasal and facial pain due to mucosal incisions and manipulations on the cartilaginous septum of the nose and osteotomy of the septum and floor of the nose, as well as due to the tampon that is placed inside the nose after this operation(2). Various drugs and methods have been suggested to reduce pain and prevent nausea and vomiting after surgery. Depending on the different routes of pain, using different methods or combining them together in pain control can have a different effect on improving pain control(3). Common medications for pain control after surgery include common painkillers such as acetaminophen, nonsteroidal anti-inflammatory drugs, and narcotics. The use of any of these drugs has its side effects and problems (4). Acetaminophen in normal doses may not be enough to relieve much of the pain. Nonsteroidal anti-inflammatory drugs (NSAIDs) increase bleeding after surgery, and opioids have side effects such as respiratory arrest, paralytic ileus, and drug poisoning. Therefore, any solution that reduces the use of painkillers after surgery is beneficial to the patient and is also economically justifiable (5). One common method is to use painkillers before the pain starts. In this way, the central nervous system is protected from being sensitive to pain nerve stimuli that lead to increased pain sensation(6). This method means starting an analgesic drug before the onset of painful stimuli to prevent central nervous system sensitization and subsequent pain experience (7). Adequate amounts of inhaled anesthetics do not prevent central nervous system sensitization. Therefore, even a patient under general anesthesia is prone to surgery allergies. Strategies used to prevent central nervous system allergies include injections of local analgesics, nerve blocks, epidural blocks, subarachnoid blocks, venous analgesics, and anti-inflammatory drugs (8). Alpha 2 agonists have been used clinically for many years and are mainly used to treat high blood pressure. These drugs have recently been used in anesthesia and pain control, which include increasing the effect of old analgesics such as narcotics. Drugs of this group have been used for various purposes such as headache, back pain, neuropathic pain and pain in malignancies, anesthetic prodrug to control postoperative pain and also to reduce

bleeding during surgery(9). Tizanidine is an alpha-2 agonist used as a muscle relaxant that acts through the central nervous system (8). The most commonly used uses of tizanidine are muscle spasm relief, prophylaxis of chronic headaches, spasticity treatment, and anesthesia prodrug. The aim of this study was to determine the effectiveness of tizanidine as a prodrug in reducing pain after septoplasty surgery.

Materials and Methods

Study design: This descriptive cross-sectional study was conducted during 2018-19 with the participation of 100 patients after septoplasty surgery in the hospitals of Tabriz University of Medical Sciences. In order to estimate the sample volume, the alpha level was 0.05, the study capacity was 80% and the effectiveness of this drug was 25%, the sample volume was estimated to be 100 people. All patients were admitted to the study by available sampling criteria and by available sampling method.

Inclusion / Exclusion Criteria: Inclusion criteria included age between 18 and 50 years, candidate for elective septoplasty and consent to participate in the study, and Exclusion criteria also included sensitivity to the drug used, heavy bleeding during surgery, history Stomach ulcers, history of corticosteroids, drug addiction, liver and kidney disease, and contraindications to tizanidine.

Methods

In this study, the results of using tizanidine to control pain after septoplasty were evaluated; Therefore, the results were compared in those who used this drug and those who did not. Half of the patients were given one tizanidine tablet orally two hours before entering the operating room; Others were not given any medication. The patients then went to the operating room and underwent surgery. Pain intensity was assessed every hour for the first six hours and then every six hours for up to 24 hours after surgery. Visual pain scale was used to assess pain intensity. Age and sex, body mass index and duration of surgery were assessed between the two groups. Acetaminophen tablets were used to control postoperative pain if the pain was unbearable.

Ethical considerations: After registering this study in the ethics committee of Tabriz University of Medical Sciences and coordinating with Tabriz hospitals of medical sciences, this study began; Conscious consent was obtained from all participants in the study. No fees were charged to participants for rejecting the study.

Statistical analysis: The collected data were fully entered into SPSS software (version 21); Mean and standard deviation or frequency and percentage were used to display descriptive information. T-test was used to compare the mean pain intensity between the two groups. P value less than 0.05 was considered significant.

Results

The study of demographic information of the study participants showed that there was a statistically significant difference between age, sex, height, weight, body mass index, duration of anesthesia, duration of surgery, history of diabetes and history of hypertension between the two groups participating in the study. did not have; Comparison of demographic information of study rejection participants is presented in Table 1.

Table 1: Comparison of demographic information of study participants

Variable		Groups (N = 100)		P Value
		Tizanidine (N=50)	Control (N=50)	
Age		26.45±4.15	25.96±4.02	0.259*
Sex	Male	22- 44%	24-48%	0.115 **
	Female	28- 56%	26-52%	
High		165.74±10.59	169.11±11.44	0.369*
Weight		69.54±3.88	71.24±4.03	0.225*
Body Mass Index		23.55±3.10	22.99±3.16	0.459*
Diabetes	Yes	10- 20%	9-18%	0.559 **
	No	40- 80%	41-82%	
Hypertension	Yes	6- 12%	7-14%	0.493 **
	No	44- 88%	43-86%	
Surgery Time (Min)		157.41±12.96	161.03±12.62	0.554 *

Anesthesia Time (Min)	182.21±15.10	187.32±14.66	0.224*
***: T Test **: Chi-Square**			

Comparison of pain intensity during the first six hours after the study showed that pain intensity in patients taking tizanidine was significantly lower than in the group who did not use the drug; Comparison of pain intensity from 6 hours to 24 hours after surgery showed that there was no statistically significant difference between the two groups participating in the study. The use of acetaminophen tablets to control pain after surgery also showed that there was no statistically significant difference between the two groups participating in the study. The results of comparing pain intensity and acetaminophen to control pain between the two groups participating in the study are presented in Table 2.

Table 2: Comparison of pain intensity of acetaminophen used to control pain in study groups

Variable	Groups (N = 100)		P Value
	Tizanidine (N=50)	Control (N=50)	
VAS (1)	2.02±0.02	3.14±0.41	0.014*
VAS (2)	2.15±0.14	3.25±0.52	0.025*
VAS (3)	2.24±0.25	3.36±0.63	0.033*
VAS (4)	2.41±0.32	3.47±0.74	0.038*
VAS (5)	2.69±0.52	3.58±0.85	0.042*
VAS (6)	2.71±0.41	3.69±0.96	0.045*
VAS (12)	3.42±0.45	3.96±0.99	0.089*
VAS (18)	3.52±0.59	4.14±0.12	0.096*
VAS (24)	3.90±0.96	4.59±0.45	0.114*
Acetaminophen use	2.01±0.41	2.96±0.1578	0.125*
***: T Test**			

Discussion

Pain is a general term that describes unpleasant feelings in the body. Pain stems from the activation of the nervous system. The pain can range from annoying to debilitating, and can cause a feeling of sudden and severe pain to a mild to chronic pain. The pain can also be in the form of throbbing pain, burning, pain from injury and similar pain (8). The pain can be persistent, it can take over and over again, or it can only appear under certain conditions. The pain can be acute or last longer. The pain may be related to a specific injury or problem, or it may be chronic and the pain may persist for more than three months (9). The pain can be localized and affect a specific part of the body, or it can be general, such as the general pain associated with the flu. Despite many chronic conditions, the cause of the pain is unknown. Surgery pain is an unbearable pain that has always called on researchers to find ways to manage it (10). The findings of this study did not show that preoperative tizanidine administration reduced postoperative pain in septoplasty (in the first six hours after surgery) in patients. Few studies have been performed on the effects of preoperative tizanidine. Tizanidine is a class of muscle relaxants (11). Muscle relaxants are prescribed to prevent and reduce severe muscle cramps and contractions. Intermittent muscle contractions (spasticity) occur when the muscles have a strong contraction. In this case, the muscle becomes stiff so that it is difficult to move and work with it and the person feels pain and discomfort (12). Therefore, tizanidine to relieve long and intermittent contractions caused by diseases such as MS and trauma and injury. Head and back injuries that lead to long-term muscle complications (such as spinal cord injuries) are prescribed. Tizanidine helps to relax the muscles and relieve pain and discomfort by acting on the nerves and spinal cord (13). It acts as a 2α receptor agonist at the spinal and supraspinal levels, inhibiting stimulatory interneurons and thus reducing muscle spasm(14). The drug is well absorbed from the gastrointestinal tract following oral administration. The half-life of the drug is about 12 hours and it is 30% bound to plasma proteins. Tizanidine is extensively metabolized by the first hepatic passage (cytochrome P450 enzyme pathway, especially CYP1A2). The half-life of the drug is 2-4 hours (15). Various studies have been performed to evaluate the effects of tizanidine, in most of which the pain intensity after surgery has been significantly reduced. Other studies have shown that tizanidine is effective in preventing chronic tension-type headaches,

improving spastic hypertension in children with cerebral palsy, and improving neuropathic pain, but it has also been recommended to conduct more comprehensive clinical trials.

Conclusion

Pain after septoplasty surgery is known as moderate pain; Its control and management is very important for patients and the health team. In this study, it was found that the use of tizanidine tablets can be useful in controlling pain in the early hours after surgery; But long-term rejection has no beneficial effect. Due to the short-term effects of this drug, this drug can be used in the early hours after surgery to avoid the use of opioid drugs.

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