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Comparison of Analgesic Effects of Post-operative Morphine, Pre-emptive and Post-operative Paracetamol in Septorhinoplasty Surgery

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Abstract

Background: According to previous studies, there are some different opinions on pre-emptive effects of Paracetamol in controlling post-operative pain. We aimed to compare analgesic effects of pre-emptive Paracetamol with post-operative Paracetamol and morphine in patients undergoing septorhinoplasty.**Materials and Methods:** One hundred six patients aged 15 to 50 were divided into 3 groups. One received 1g Paracetamol 30 minutes before operation, another group received 1g Paracetamol after surgery and the control group received 3mg morphine sulfate in recovery room after surgery. Pain severity was recorded for each patient using a 10 slot table. Any signs of nausea and vomiting (N/V) or apnea were closely observed and recorded. Patients with pain score 5 or more received 2 mg morphine intravascularly.**Results:** There were not any significant differences between these groups in total pain score and N/V ($P>0.05$). Post-operative morphine intake was significantly lower in pre-emptive group ($P<0.05$). None of the patients experienced apnea during this study. **Conclusion:** We concluded that pre-emptive Paracetamol can lower opium consumption in post-operative period but pre-emptive Paracetamol cannot reduce post-operative acute pain noticeably. **[GMJ.2015;4(2):121-25]**

Keywords: Paracetamol; Septorhinoplasty; Pre-emptive Analgesia; Analgesics

Introduction

Controlling post-operative pain is an important issue and very little is known about the outcomes of not handling the problem [1]. Recent studies show some improvements, but under-treatment of pain is still a big concern [2]. The first problem to deal with is the acute post-operative pain. Acute pain (if untreated) can even lead to a chronic pain [3]. It is declared that chronic pain is the most common and the most important post-operative problem following some minimal surgeries such a herniorrhaphy [4]. The prevalence of chronic pain varies from surgery to surgery but it is clear that chronic pain is a common post-operative problem [5]. A study conducted in Europe measured the impact of chronic pain on people's daily lives and the results were shocking; many respondents reported that pain lowered their life quality and their ability to do different activities is decreased significantly by the persistent pain [6]. This shows the importance of preventing the development of chronic pain and the first step is to control the acute one.

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Tissue damage results in stimulation of pain pathways in neuronal system. There are several ways of administering pain killers during and after surgery; different analgesic methods and their relation to acute pain have been studied [7]. Opioids and non-opioid substances are currently available for pain treatment but the side effects of opioids are a challenge so their administration has some limitations [8]. New methods such as pre-emptive analgesia may be s solution in this regard.

Administrating analgesics before surgery which is also called pre-emptive analgesia is a new treatment for reducing post-operative pain [9]. Studies show that preventive effects of pre-emptive analgesia can be more efficient than the routine post-operative pain treatments [10]. As a consequence of pre-emptive analgesia, acute postoperative pain may be reduced and the development of post-operative chronic pain can be prevented. Pre-emptive analgesia has three goals in pain treatment: to calm the pain caused by inflammatory agents at the surgical excision site, to prevent the pain memory response of the central nervous system (CNS), and to control post-operative pain in order to prevent chronic pain development. Drugs such as Paracetamol have been under investigation as a pre-emptive analgesic agent [11].

Paracetamol is part of the class of drugs known as "aniline analgesics" [12,13]. Intravenous Paracetamol is a potent anti-pyretic and analgesic in human and animal models. The routine dosage in adults is 1g up to four times a day, with at least 4 hours between doses and a maximum daily dose of 4g [14].

Every year lots of people undergo septorhinoplasty surgery. It is an invasive method which will bring in lots of post-operative complications such as infection, deformities, nerve damage and pain [15]. Thus, it is important to control its post-operative complications specifically the post-operative acute pain.

The purpose of this study was to evaluate the pre-emptive analgesic effects of intravenous Paracetamol compared to post-operative intravenous Paracetamol and morphine sulfate in controlling acute postoperative pain in patients who underwent septorhinoplasty.

Materials and Methods

Sampling Method

In a randomized double-blind clinical trial, after approval of local health authorities and medical ethics committee of Shiraz University of Medical Sciences, patients aging between 15 and 60 years old scheduled for Septorhinoplasty operation, were randomly selected and recruited for the study. All procedures were explained to them and signed informed consents were obtained. Patients with a history of any cardiac, pulmonary, hepatic, renal or neurological diseases, history of consuming any opioids, allergy to any of the substances administrated in the study, history of experiencing problems such as hypoxia, hypercapnia or cardiac arrest during or after the operation and severe inflammatory problems or infections were excluded from the trial.

In the first step, each patient was given a number between 1 and 180 by the admission officer who was trained before the procedure. The study was designed to follow at least 30 patients in each group. At the end, 106 patients remained in the study and the others were excluded. Next, another operator randomly put the patients in three groups (n=60). Regarding exclusion criteria, some of the participants were omitted at the end of the study from each group.

Study Design

This was a prospective, randomized, double-blind study comparing three groups: Pre-emptive group (PE) which received 1g intravenous Paracetamol before operation (n=32), post-operative group (PO) which received 1g intravenous Paracetamol after the operation (n=40), and the control group (C) which received 3mg post-operative intravenous morphine sulfate (n=34). In PE group, intra-venous Paracetamol was administrated 2 hours before the operation via 30 minutes infusion. In PO group, patients received post-operative Paracetamol in the recovery room right after the surgery infused in 30 minutes and group C received 3mg morphine sulfate in the recovery room infused in 1 minute. Drugs were administered by another expert who did not have any knowledge

about the grouping methods. Subjects were observed for 24 hours after being discharged from the recovery room at 2-hour intervals by a trained observer who did not have any knowledge about the injected drugs or the groups. Patients were given 2mg of intra-venous morphine sulfate if their pain score was more than 5/10.

Evaluation of Responses

Subjects were interviewed every 2 hours by the observer. A 10 slot table was designed for recording pain score. Patients reported the severity of pain by pointing to one of the slots (ranging from 0 to 10, 0 for no pain and 10 for the worst possible pain). Participants were checked for presence of nausea and vomiting (N/V). If "yes", the patient was given 1 and if "no" the patient was given 0. The number of patients in each group who experienced apnea at least once during the study was recorded too. Apnea was defined as a patient stops breathing for 15 seconds or if the patient could not breathe without an oxygen mask.

Data Analysis

Subjects' pain scores were recorded every 2 hours. Total pain score was defined as the sum of patients pain scores. Data were analyzed using SPSS version 14.0. T-test and chi-square test were used. $P<0.05$ was defined as statistically significant.

Results

There was not a significant difference between groups regarding their age and sex. Group C had the highest mean in total pain score (15.32±4.75), while PO and PE groups showed lower scores (12.80±6.23 and 13.43±5.64, respectively), but there were no significant differences in this regard among the groups ($p>0.05$).

In control group, 35.2% of patients experienced N/V, in PE group it was 31.25% and the percentage for PO group was 27.5%; however, no significant differences were detected ($p>0.05$).

As declared, patients with pain score more than 5 received extra intravenous morphine; of them 32.3% were in group C, 15.6% in PE group, and 37.5% were from PO group. Morphine intake was significantly lower in PE group in comparison to other two groups ($P<0.05$). There was no significant difference between group C and PO group. Moreover, no patient experienced apnea during this trial.

Discussion

As seen, pre-emptive analgesia is one of the most innovating methods in preventing acute post-operative pain. In a review article by Campiglia et al mentioning the necessity of paying attention to pre-medication in surgical operations, it was concluded that pre-emptive analgesia is a useful method in reducing post-operative pain lowering the consumption of analgesics during post-operative time period [16]. In another review article by McQuay et al, [14] randomized trials, published between 1987 and 1994, were evaluated. It did not demonstrate a pre-emptive effect for Paracetamol [11]. Arici et al designed a trial to evaluate pre-emptive effects of Paracetamol in patients undergoing total abdominal hysterectomy. Ninety patients were divided into 3 groups; a control group which received saline as placebo, a group receiving Paracetamol 1g intravascularly 30 minutes prior to anesthesia induction, and the third group which received intravascular Paracetamol 1g prior to suturing and skin closure. Morphine intake and total pain scores were lower in the group receiving pre-emptive analgesia, so it was concluded that in major surgeries such as total abdominal hysterectomy, pre-emptive Paracetamol provided a good post-operative analgesia and decreased consumption of morphine and its possible side effects [17]. In another trial, Joshi and colleagues evaluated pre-operative Ibuprofen, Diclofenac and Paracetamol with codeine and placebo tablets for relief of post-operative pain after removal of impacted third molars. Patients were given tablets 1h before the operation and pain score was recorded closely after the procedure. Although N/V was reported in some participants, results showed a pre-emptive effect for Paracetamol [18]. Romej et al recruited 28 children, aged 2-8 years old, who were scheduled for elective tonsillectomy. Patients were divided into

2 groups; one received pre-emptive Paracetamol and the other received post-operative Paracetamol. Total post-operative morphine consumption was not significantly different between these groups, but acute post-operative pain was significantly lower in pre-emptive group [19].

Our results demonstrated that pre-emptive analgesia can reduce patients' consumption of opioids due to post-operative pains. It is assumed that Paracetamol, when administrated before procedure, hinders the stimulation of Nociceptors and prevents the formation of severe pain. We showed that the number of patients who experienced pain score more than 5 was smaller in PE group, so pre-emptive Paracetamol can reduce post-operative pain severity, though it was not able to reduce total pain significantly.

Conclusion

Pre-emptive Paracetamol has a noticeable impact on reducing opium consumption after Septorhinoplasty surgery. It controls the severity of acute post-operative pain. Paracetamol is a safe drug with minimal side effects and can be used as a pre-emptive agent combined with other analgesics. However, pre-emptive Paracetamol did not have any preventing effects on post-operative N/V. Further studies are still needed to confirm the efficacy of Paracetamol as a pre-medication on post-operative pain and to compare it with other consumed agents in this regard.

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Conflict of Interest

None declared.

References

1. Morrison RS, Magaziner J, McLaughlin MA, Orosz G, Silberzweig SB, Koval KJ, et al. The impact of post-operative pain on outcomes following hip fracture. Pain. 2003;103(3):303-11.
2. Lynch EP, Lazor MA, Gellis JE, Orav J, Goldman L, Marcantonio ER. Patient experience of pain after elective noncardiac surgery. Anesth Analg. 1997;85(1):117-23.
3. Macrae WA. Chronic pain after surgery. Br J Anaesth. 2001;87(1):88-98.
4. Jenkins JT,O'Dwyer PJ.Inguinal hernias. BMJ. 2008;336(7638):269-72.
5. Macrae WA. Chronic post-surgical pain: 10 years on. Br J Anaesth. 2008;101(1):77-86.
6. Breivik H, Collett B, Ventafridda V, Cohen R, Gallacher D. Survey of chronic pain in Europe: prevalence, impact on daily life, and treatment. Eur J Pain. 2006;10(4):287-333.
7. Dolin SJ, Cashman JN, Bland JM. Effectiveness of acute postoperative pain management: I. Evidence from published data. Br J Anaesth. 2002;89(3):409-23.
8. Walsh TD. Prevention of opioid side effects. J Pain Symptom Manage. 1990;5(6):362-7.
9. Dahl JB, Moiniche S Pre-emptive analgesia. Br Med Bull. 2004;71:13-27.
10. Moiniche S, Kehlet H, Dahl JB. A qualitative and quantitative systematic review of preemptive analgesia for postoperative pain relief: the role of timing of analgesia. Anesthesiology. 2002;96(3):725-41.
11. McQuay HJ. Pre-emptive analgesia: a systematic review of clinical studies. Ann Med. 1995;27(2):249-56.
12. Malaise O, Bruyere O, Reginster JY. Intravenous Paracetamol:a review of efficacy and safety in therapeutic use. Future Neurol. 2007;2(6):673-88
13. Bertolini A, Ferrari A, Ottani A, Guerzoni S, Tacchi R, Leone S. Paracetamol: new vistas of an old drug. CNS Drug Rev. 2006;12(3-4):250-75.
14. Duggan ST, Scott LJ. Intravenous Paracetamol (acetaminophen). Drugs.2009; 69:101-13

15. Rettinger G, Kirsche H. Complications in septoplasty. Facial plastic surgery : FPS. 2006;22(4):289-97.
16. Campiglia L, Consales G, De Gaudio AR. Pre-emptive analgesia for postoperative pain control: a review. Clin Drug Investig. 2010;30 Suppl 2:15-26.
17. Arici S, Gurbet A, Turker G, Yavascaoglu B, Sahin S. Preemptive analgesic effects of intravenous Paracetamol in total abdominal hysterectomy. Agri : Agri (Algoloji) Dernegi'nin Yayin organidir = The journal of the Turkish Society of Algology. 2009;21(2):54-61.
18. Joshi A, Parara E, Macfarlane TV. A double-blind randomised controlled clinical trial of the effect of preoperative ibuprofen, diclofenac, Paracetamol with codeine and placebo tablets for relief of postoperative pain after removal of impacted third molars. The British journal of oral & maxillofacial surgery. 2004;42(4):299-306.
19. Romej M, Voepel-Lewis T, Merkel SI, Reynolds PI, Quinn P. Effect of preemptive acetaminophen on postoperative pain scores and oral fluid intake in pediatric tonsillectomy patients. AANA journal. 1996;64(6):535-40.