Rhinology, 45, 321-324, 2007

The effect of prilocaine and prilocaine plus meperidine infiltration on the pain during nasal packing removal*

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SUMMARY

Objective: *Removing the nasal packing after nasal surgery is an uncomfortable and painful procedure. Since there is no controlled trial described in the literature about the local use of meperidine during packing removal, we aimed to compare the analgesic and sedative effects of the meperidine-prilocaine combination, injected into the packing 15 minutes before the procedure, with that of prilocaine during packing removal.*

Methods: *Fifty adult patients, for whom nasal packing removal after nasal septoplasty was scheduled, were randomly allocated into one of two groups. In the prilocaine group (Group P, n=25), 5 ml of 1% prilocaine in saline was injected into the pack 15 minutes before removal. In the prilocaine-meperidine group (Group MP, n=25), 5 ml fluid combination containing prilocaine (10 mg/ml) and meperidine (1 mg/kg) was injected in nasal packs. Five ml saline was injected into the package in the contra-lateral nostril in both groups as control. Visual analogue scale (VAS) score was recorded during injections (t_1) and packing removal (t_2), and the Ramsay sedation score was evaluated.*

Results: *VAS score was not different from the control nostril in Group P ($p > 0.05$), where as it was significantly lower than the control nostril in Group MP ($p < 0.05$). Ramsay sedation scores were significantly higher in Group MP compared to the control nostril and actively treated nostril of Group P ($p < 0.05$).*

Conclusion: *The injection of prilocaine plus meperidine into the nasal pack 15 minutes before nasal packing removal provides effective analgesia and mild sedation during the procedure.*

Key words: Nasal surgery, nasal packing removal, prilocaine, meperidine, analgesia, sedation

INTRODUCTION

Nasal packing is a commonly performed application in daily nasal surgery practice. Nasal packing provides some advantages such as controlling bleeding, decreasing edema, providing internal support to the bony parts, and increasing septal flap apposition [(1,2)]. Materials used included pneumatic balloons [(3)], bismuth, iodine and paraffin paste (BIPP) [(4,5)], vaseline gauze [(4,5,6)], Telfa [(4,5)] and Merocel nasal packs [(4)]. The recommended duration for nasal packing differs from 2 hours to 5 days [(7-10)].

Pain during the packing removal is an important complaint that may cause an uncomfortable situation for the patients. Many patients who have undergone nasal surgery report that the removal of the pack was the most painful part of the experience [(9)]. Packing removal in our institution is generally performed in the ear, nose and throat (ENT) ward with topical analgesia by surgeons.

Meperidine is a unique opioid agent that possesess both local anesthetic and sedative properties, and is also absorbable via the nasal mucosa [(11)]. To the best of our knowledge a sedative analgesic agent has never been reported to be of use for nasal packing removal. The purpose of this study was to compare Prilocaine alone with a Prilocaine plus Meperidine combination in regard to the control of pain and sedation during nasal packing removal.

METHODS

Patients

Following approval by the ethical committee, informed consent was obtained from 50 patients with ASA physical status of I-II, aged between 18-50 years, in whom nasal packing removal was planned after nasal septoplasty surgery and they were enrolled in the study. Exclusion criteria included pregnancy, history of serious adverse reaction or allergy to any

*Received for publication: May 1, 2007; accepted: August 25, 2007

study drug, significant cardiac or renal pathology, and taking sedatives regularly.

Procedures

In all patients the package was made of Merocel packs (hydroxylated polyvinyl acetate tampons) that expand in contact with fluid. The postoperative analgesia included acetaminophen or diclofenac orally as needed. The packs were removed on the morning of the second postoperative day. Patients were randomly allocated into one of two groups. A volume of 2,5 ml of 2% prilocaine (Citanest 2%, AstraZeneca Labs.) was made up to a volume of 5 ml with 2,5 ml saline and injected into the pack material 15 minutes before removal in the prilocaine group (Group P, n=25). In the prilocaine-meperidine group (Group MP, n=25), 2,5 ml of 2% prilocaine was diluted to a final volume of 5 ml with saline and meperidine (Aldolan 50 mg/ml, Gerot-Liba Labs.) to adieve a final meperidine dose of 1 mg/kg. This combination was injected into the pack material in the same manner to that of prilocaine group. In both groups 5 ml in the same manner was injected as control into the package to be inserted to the contra-lateral nostril. The saline solution was injected firstly in both groups into the package 15 min before removal to avoid the effects of the study drugs on the control nostril. The control side of the nose was also selected randomly. After completion of package removal from the control nostril, the study drugs were injected as prepared mixtures. In both groups, all procedures were performed by the ENT surgeon, who was blinded for the treatment, at the side of septal incision. Study drug mixtures were prepared by an anesthesiologist. All assessments were performed by the second anesthesiologist who was also blinded to the patient group.

Recordings

Cardio respiratory monitoring included systolic arterial pressure (SAP), diastolic arterial pressure (DAP), mean arterial pressure (MAP), heart rate (HR), pulse oxymetry (SpO_2), and rate of respiration (RR). After baseline measurements (t_0) SAP, DAP, MAP, HR, SpO_2 and RR were recorded after the injection of study drugs (t_1) and after packing removal (t_2). Adverse events such as nausea and vomiting, desaturation, arrhythmia and hypotension were also recorded.

Scoring system

Visual analogue scale (VAS) score was recorded both during injections (t_1) and packing removal (t_2), and the Ramsay sedation score was also evaluated during packing removal. The VAS scores were evaluated using a ruler with two anchor points; zero being no pain and ten being the worst pain the patient had ever experienced. Sedation was evaluated at the same time with VAS assessment using Ramsay sedation scale (12) (1: patient is anxious and agitated or restless, or both; 2: patient is cooperative, oriented and tranquil; 3: patient responds to commands only; 4: patient exhibits brisk response to light glabellar tap or loud auditory stimulus; 5: patient exhibits a sluggish response to light glabellar tap or loud auditory stimulus; 6: patient exhibits no response).

Statistics

NCSS was used for the analyses of power (Hintze, J. (2001) NCSS and PASS. Number Cruncher Statistical Systems, Kaysville, UT, USA). Group sample sizes of 25 and 25 achieve 90% power to detect the difference between the group means for VAS and Ramsay scores. Data were performed using SPSS software program for Windows version 9.0 (SPSS Inc., Chicago, IL, USA). Mann-Whitney U test was used for continuous variables. Categorical data were compared using the chi-square test or Fisher's exact test. P values < 0.05 were considered statistically significant.

RESULTS

The two groups were comparable in terms of demographic data (age, sex, body weight, height) (Table 1). The hemodynamic and respiratory variables (SAP, MAP, DAP, SpO_2, RR) were not different between the groups. However in Group P, the VAS score at the t_2 time point was not significantly lower compared with the control nostril ($p > 0.05$). In Group MP, the VAS score at the t_2 time point was significantly lower compared with the scores of control nostril ($p < 0.05$). Ramsay sedation scores were significantly higher in Group MP compare to control nostril and the nostrils of group P ($p < 0.05$) (Table 2). None of the patients experienced respiratory depression, nausea and vomiting, bradycardia, or hypotension in any group.

Table 1. Demographic characteristics of the patients (mean ± SEM).

Variable	Group P (n=25)	Group MP (n=25)
Sex (Male/Female)	16/9	18/7
Age (year)	29.52 ± 2.24	32.60 ± 2.51
Height (cm)	167.36 ± 1.59	172.28 ± 1.53
Weight (kg)	63.40 ± 2.58	73.96 ± 3.06

SEM = Standard error mean

DISCUSSION

The ideal agent should be short-acting, safe, inexpensive and easy to administer in dealing with the problem of pain or discomfort on removal of nasal packing. Many previous reports have been related to the methods of injection into nasal packs [13]. Kuo et al. [6] investigated the effect of topical 5% lignocaine ointment on pain relief compared with a standard vaseline gauze pack. They showed that topical lignocaine significantly reduced the postoperative pain at 3 hours, but not at 6 hours postoperatively nor at pack removal. Laing and Clark [14] compared intramuscular papaveretum and Entonox (a mixture of 50% nitrous oxide and 50% oxygen) in relieving pain associated with nasal packing removal. The authors advocated Entonox due to safety and low cost. Other disadvantages of inhaled nitrous oxide were reported to be the unavailability in the oto-

Table 2. Visual Analog Scale and Ramsay Sedation scores in groups (mean ± SEM).

Values	Group P Hemi nose (n=25)			Group PM Hemi nose (n=25)		
	given P	given SF	p-value	given PM	given SF	p-value
t_1 VAS (injection)	1.92 ± 0.32	1.60 ± 0.24	0.43	2.24 ± 0.23	2.84 ± 0.23	0.07
t_2 VAS (removal)	3.92 ± 0.44	4.84 ± 0.47	0.43	2.68 ± 0.25	4.36 ± 2.13	0.01
Ramsay	1.80 ± 0.08	1.60 ± 0.10	0.23	2.16 ± 0.11	1.60 ± 0.10	0.001

SEM (Standard error mean)

laryngology wards and temporary drowsiness. Therefore we preferred the injection of local anesthetics, with or without opioid injected into the nasal packs.

Durvasula et al. [15] compared the effects of receiving 10 ml either 2% lignocaine or 0.9% saline topically on the packs and found no significant difference in pain scores between the groups. The authors suggested further studies to investigate safety and efficacy of higher concentrations lignocaine to enhance the rate of systemic absorption of topical lignocaine from the nasal mucosa.

Hwang et al. [16] found that sphenopalatine ganglion block for nasal packing removal with 1% Xylocaine in a volume of 2-3 ml provided significant analgesia compared with the control group. However, that study may be criticized because of small sample size (only 11 cases), the need for experience for performing this invasive technique and the high incidence of hematoma (10%). In the present study we performed a method of injection of analgesia into the pack that will be applicable in any ENT department with minimum training and low complication rate.

In a prospective study, it was found that there was no significant difference in ease of removal between packing materials including Telfa, paraffin gauze, Merocel and bismuth iodoform paraffin paste (BIPP) [4]. Both Telfa and paraffin gauze provided significant less discomfort and less bleeding than Merocel and BIPP. However, we used the Merocel packs, which are the routine packing material after nasal surgery in our ENT department.

It was suggested that it is beneficial to evaluate the pain scores in comparison with the local anesthetic levels in blood during removal to exclude different analgesia levels due to various local anesthetic concentrations [17]. Additionally, the timing of removal may also affect the analgesia levels. We did not consider the local anesthetic levels and removed all packs at the morning of the third postoperative day.

Although it can be expected that patients would experience more pain on the side of the incision, Lavy et al. [18] showed that there was no significant difference in pain between the incision side and the non-incision side (her/his own control) on pack removal. In our study the physicians were blinded to both injected drugs and the incision side.

The anxiety of the patient is another important problem together with the pain during pack removal. In the literature we could not find any report about an agent providing sedation during this procedure. We chose to use meperidine, which is absorbable by the mucosa, and posseses both sedative and analgesic properties. We showed that prilocaine supplemented with meperidine provided significantly lower anxiety levels with gain of comfort in 15 minutes for patients undergoing the pack removal procedure.

We conclude that an effective analgesia and mild sedation can be provided by the injection of prilocaine plus meperidine into the nasal pack during nasal packing removal.

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