

Original Research Article

Comparison of postoperative analgesia between greater palatine nerve block with local infiltration and local infiltration alone in septoplasty surgeries

Karthik Madesh R.¹, Pankaj Kumar Sahu^{1*}, Arjun A. P.¹, Srujan Vallur², Nagababu Pyadala³

¹Department of ENT, Command Hospital Air Force, Bangalore, India

²Department of ENT, 12 Air Force Hospital, Gorakpur, Uttar Pradesh, India

³Department of Biochemistry, MNR Medical College and hospital, Sangareddy, Telangana, India

Received: 18 February 2020

Accepted: 03 March 2020

*Correspondence:

Dr. Pankaj Kumar Sahu,

E-mail: drpksahu0711@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Post-operative pain (POP) management is an important factor for the satisfaction after any surgery to patients. The purpose of this study was to evaluate the effect in the post op pain levels by addition of greater palatine nerve block (GPNB) to the local mucosal infiltrative anaesthesia during septoplasty surgery.

Methods: A prospective study of 108 patients undergoing septoplasty surgery were divided into 2 groups. Group A with 52 patients and B with 56 patients. Group A received GPNB along with local infiltrative anaesthesia while group B received only the local infiltrative anaesthesia. The POP was studied in them using visual analogue score (VAS) at the 2nd, 5th and 8th post-operative hour.

Results: The median VAS of group A at the 2nd, 5th and 8th hour were 2, 2 and 1 respectively while of the group B were 6, 6 and 5 during the same timeline assessment. The decreased POP in group A over B was statistically significant during all the assessments with ($p < 0.001$). The post-operative pain was significantly lesser with no increase in time of surgery, with negligible expenditure and no complications.

Conclusions: Greater palatine nerve block can be utilized as an effective addition to septoplasty surgery utilizing the same drug along with local infiltration and give a simple, cost effective and safe addition for a comfortable pain free post op period for a prolonged duration.

Keywords: Post-operative pain, Greater palatine nerve block, Regional anaesthesia, Local anaesthesia, Septoplasty, Visual analogue scale, Nasal surgery

INTRODUCTION

Effective and satisfactory management of post-operative pain (POP) is one of the goals of any surgery. Although POP management is essential for avoiding delayed functional recovery and patient's dissatisfaction following the procedure, little work has been done investigating POP management in the setting of nasal surgeries.¹ Due to the relatively high frequency with which septoplasties are performed and ease and safety with which greater palatine nerve block (GPNB) can be

performed the routine use of this technique appears reasonable for septoplasty if beneficial to patients.²

The purpose of this study was to investigate whether preemptive GPNB in addition to local infiltration may decrease POP and discomfort and improve patient functional outcomes after septoplasty. We hypothesize that performing an additional GPNB prior to beginning of septoplasty will effectively block or significantly reduce post-operative amplification of pain outcomes.

METHODS

Patients who visited the ENT clinic at the command hospital airforce, Bangalore (CHAFFB) were recruited for the study from December 2017 to February 2019. A total of 108 patients participated in the study and written informed consents were obtained from all of them prior to the surgery.

Inclusion criteria

Age between 10 and 75 years, DNS causing significant nasal airway blockage.

Exclusion criteria

Pre-existing chronic pain of different aetiology, taking prescription pain medications, receiving antidepressant medications, taking over-the-counter pain medications within 48 hours of scheduled surgery, patients in whom oral, opioid-containing analgesics would be contraindicated postoperatively, history of arrhythmias or significant coronary artery disease, psychological disorders, patients who are unable to understand the questionnaires or the VAS pain scores, history of substance or alcohol abuse, history of allergy to bupivacaine, lidocaine, or epinephrine.

This was a prospective comparative study of two groups assigned randomly (Group A and B of 52 and 56 patients respectively). The local anaesthetic drug used in our study was a mixture of 2% lidocaine and epinephrine (1:100,000) to a maximum dosage of 7ml/kg body weight. GPNB using a transoral approach through the greater palatine foramen with 1.5ml of drug each side was performed in Group A patients in addition to the standard sub mucosal infiltrative anaesthesia. Group B patients received standard submucosal infiltrative anaesthesia in the region of the nasal septum and the middle turbinate. The surgery commenced 10 minutes later, to allow sufficient time for the anaesthetic effect to develop in both the groups.

Greater palatine nerve block technique

A cotton swab is placed between midline of hard palate and the maxillary alveolar process. Starting in the region of the maxillary first molar apply pressure with the cotton swab while moving posteriorly. The swab will fall into the depression created by the greater palatine foramen about 1 to 2 cm away from the 1st or 2nd molar tooth. Clean and dry the area with the sterile gauze. Move the cotton applicator posteriorly so it is directly over the greater palatine foramen and apply sufficient pressure to blanch the tissue for 30 seconds. Direct the syringe from the opposite side of the mouth at a right angle to the target area with orientation of the needle bevel (tip of the needle bent at 25 mm and 45 degree) against the blanched tissue. Slowly advance the needle approximately 8mm to

10 mm until palatine bone is contacted. Withdraw 1 mm and deposit a small volume of local anaesthetic solution.²

Outcome measurements

VAS scoring

It is the most commonly used pain scale for quantification of pain. The subjects will specify their level of measurement of pain by indicating a position along a continuous line between two end points from none to extreme amount of pain. It is a straight horizontal line of fixed length usually 10 cm, with one end meaning no pain and the other end meaning the worst pain imaginable. The VAS scale is completely filled by patients themselves. The perception of pain is marked by the patients along the line at a particular point, measured in centimetres from left hand end of the line to the point marked. Based on the intensity of pain it is quantified from 1 to 10 with 10 being the most severe pain and 1 being the lowest.³

Statistical methods

Pain by VAS with respect to time was considered as primary outcome variable. The two groups A and B were considered as primary explanatory variable. For normally distributed quantitative parameters the mean values were compared between study groups using Independent sample t-test. Categorical outcomes were compared between study groups using Chi square test or Fisher's exact test. For non-normally distributed quantitative parameters, medians and interquartile range (IQR) were compared between study groups using mann whitney U test. P value <0.05 was considered statistically significant. IBM SPSS statistics for windows, version 22.0. Armonk, NY: IBM corp, released 2013 was used for statistical analysis.

RESULTS

A total of 108 cases were studied during this research of which group A of 52 cases were given greater palatine nerve block along with the local infiltration while group B of 56 cases were given only local infiltration for the septoplasty surgery. Among the group A, the age of the study population ranged from a minimum of 14 to a maximum of 74, with a mean of 27.46. The age of the cases in group B extended from 11 to 58 with a mean of 28.89 (Figure 1).

The group A had a total of 82.69% (43) males and 17.31% (9) females while the group B had 82.14% (46) males and 17.86% (10) females. The p value on analyzing the gender composition was 0.940 (Figure 2).

In those cases of group A who received the greater palatine nerve block in addition to the conventional local infiltration, the pain in the post-operative period by VAS at the end of 2 hours was found to be a median value of 2.

Similar assessment of was done in the group B who received only local infiltration and the VAS at end of 2nd post- operative hour was a median 6. The p value was calculated to be <0.001 (Figure 3).

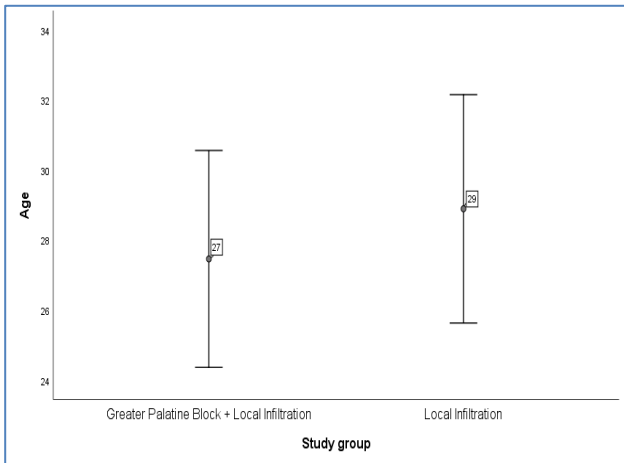


Figure 1: Comparison of mean of age between study group (n=108).

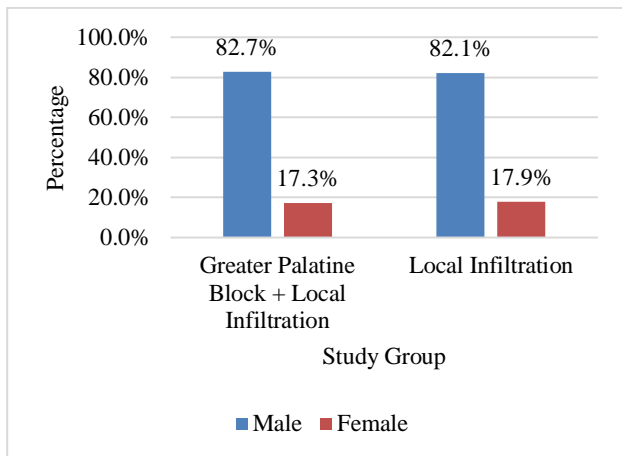


Figure 2: Comparison of gender between study group (n=108).

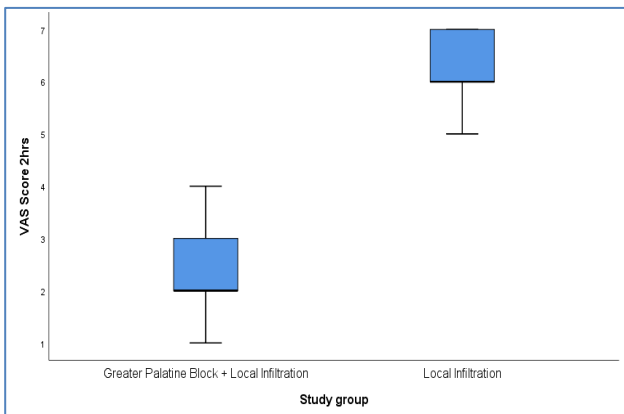


Figure 3: Comparison of VAS Score at 2 hrs between study group (n=108).

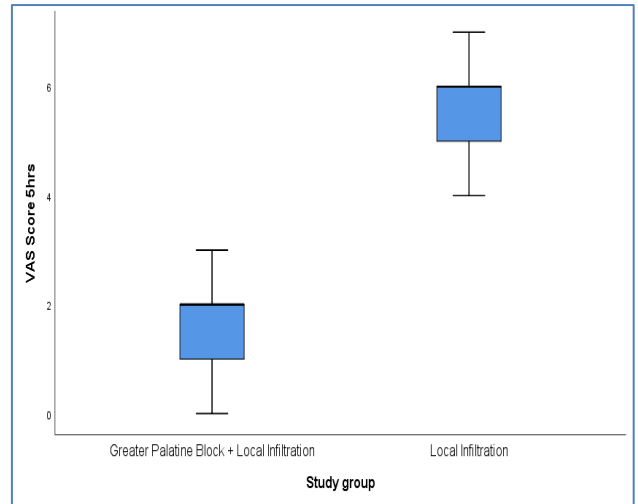


Figure 4: Comparison of VAS score at 5 hrs between study group (n=108).

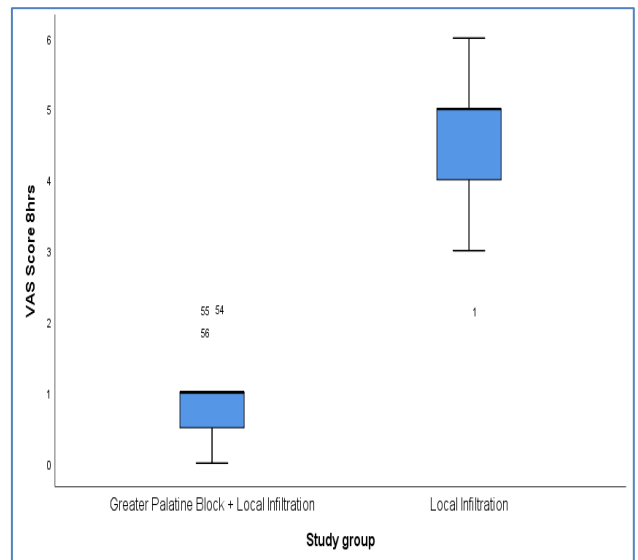


Figure 5: Comparison of VAS score at 8 hrs between study group (n=108).

The post-operative pain when measured by the VAS among the two groups A and B at the end of 5th post op hour was a median value of 2 and 6 respectively with the p value <0.001 (Figure 4). Finally, at the end of 8 hours post-surgery, the median VAS score was found to be 1 in the group A and 5 in the group B. The p value was analyzed to be a significant <0.001 (Figure 5).

The time of surgery in all the patients belonging to either of the group were similar with no significant increased surgical time in the GPN block group of cases as well. There was no significant increase in the expenditure incurred during the surgery in group A in comparison to group B. No rescue analgesia was used to any of the patients in both the groups till the final pain assessment of 8th post op hour. There were no major or minor complications related to the greater palatine block in

those who received the same as well as there were no complications with regards to the infiltration in both the group of patients.

DISCUSSION

Septoplasty is one of the most common nasal surgery performed in any ENT Centre and nasal obstruction being the common presentation of the patients requiring the surgery. As with any surgery, the post-operative period pain is a very pertinent and common complaint of the patients. Similarly, this subject has been studied frequently in many types of surgeries. The systematic review by Nguyen et al supports the necessity and the use of NSAIDS, gabapentin, local anesthetics as effective post-operative analgesic options for decreased pain scores.⁴ Our study involved population extending across wide age group with the mean age being 27.46 and 28.89 in the both the groups respectively. The majority study population belonged to the third decade age group. The pain threshold being a factor associated with age of the patient has been adequately represented in our subjects. In addition, the age composition of the two groups were comparable, with the p value of 0.526 inferring an insignificant difference. The overall gender distribution was skewed more to males with just over 84 % and the rest were females. This correlated with the general gender proportion of those undergoing septoplasty surgery at our centre. Nevertheless, the representation of males and females among the two groups were around 82% and 17% respectively with no significant variation and a p value 0.940.

The pain post septoplasty surgery was studied as a comparison between those operated under local infiltration along with greater palatine nerve block and those with only local infiltration. Ekici et al had studied the effect of endoscopic sphenopalatine ganglion block in management of post-operative pain after septal surgery by studying those operated under GA only and those with GA along with SPG block.⁵ The combined effect of greater palatine nerve block and anterior ethmoidal nerve block in various nasal surgeries including septoplasty, FESS and SMR has also been studied by Chitra et al.⁶ Cochrane review by Fujiwara et al on Perioperative local anesthesia for reducing pain following septal surgery also had analyzed the role of SPG block.⁷ The effect of SPG block in management of post-operative pain following FESS surgery had been studied in various researches including those by Rezaeian et al and Samuel et al.^{8,9} Systematic reviews and meta-analysis by Kim et al had validated the effective reduction of intra and post op pain by use of SPG block in endoscopic sinus surgeries.¹⁰

In the study by Ekici et al, the post-operative pain scores were analyzed by the VAS scale as in our study but at the timelines as in immediate post-operative, 2nd, 6th, 12th and 24th post-operative hours.⁵ The patients who had received the additional SPG block had significantly less pain as per VAS in each of the assessed time in comparison with

those who had only GA. The scores were 1.47 at the immediate post op for those who received the regional nerve block which gradually reduced to 0.77 at the 24th post op hour, whereas the other group were at 4.73 decreasing to 3.77 during the same timeline of assessment.

The effect of SPG block in post op pain after ESS studied by Rezaeian et al also used the VAS for analysis at the immediate post-operative, end of 6th, 12th and 25th post-operative hour among their two study arms of intervention and control.⁸ Bupivacaine was used for the intervention group while control group received saline injections. In the immediate post-operative period, VAS was 1.95 in those who received the SPG block and was 5.05 in those without the block. The same reduced to 1.68 and 1.05 at the 12th and 24th post op hour in the nerve block group. Whereas those without nerve block had a pain score of 3.20 and 2.30 during the evaluation at the similar post op timeline. The use of SPG block had significantly reduced pain and the need for rescue analgesia in post-operative period under study.

In our study, those cases who received the greater palatine nerve block in addition to the conventional local infiltration, the pain in the post-operative period was low in comparison to the group those who received only the local infiltration. The median VAS at the end of 2nd, 5th and 8th postop hour of the group A was a low 2, 2 and 1 whereas of the group B were 6, 6 and 5 respectively. The difference in the pain scores were statistically analyzed by the mann whitney U test and the p value were found to be <0.001 in the all the three assessed timelines. The pain scores within both the groups also were found to show a decreasing trend with increase in the postop time (Figure 6).

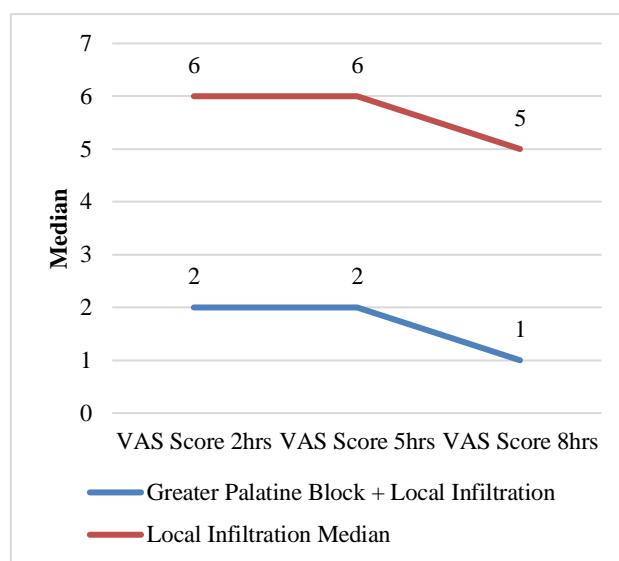


Figure 6: Comparative trend line diagram of comparison of VAS score at different follow ups between study group (n=108).

The possible complications due to the greater palatine nerve block and those reported are intravascular injections, diplopia and ptosis, injury to neural tissue and anesthetic failure. Sved et al studied over 100 cases receiving the block with blood aspirations in around 8% cases, ptosis and failure of anesthesia in around 10% population each.¹¹ Incidentally, in our study we did not encounter any significant complications in all the cases studied in our research. This may be attributed to the strictly followed protocol on the technique of giving the greater palatine nerve block evolved after extensive analysis of the existing literature on the subject.

The analgesia for post septoplasty surgery as per our institutional protocol for all patients was intravenous administration of 1 gm paracetamol infusion every 8 hours starting at the 8th post op hour of surgery, with an addition of injection diclofenac 75 mg intramuscularly (maximum of 2 doses over 24 hours) if VAS was not decreasing even with paracetamol infusion. Thus, the first dose of analgesia was given post 8th hour of surgery not interfering in the assessment of pain score as per the timeline in our study. There was no rescue analgesia given in either group of our study population till the last assessment of pain at the 8th hour post op. Hence the possibility of any confounding factor affecting the pain levels during the evaluation time was avoided effectively.

The greater palatine block in all the cases of our study were given at the beginning of the surgery as the first step followed by the local infiltration as conventionally given for the septoplasty surgery being done under local anesthesia only. Hence there was no significant increase in the surgical time but with a better outcome of pain control in the post op period. The same drug preparation of 2% lidocaine was used for the nerve block bilaterally and no special equipment or other consumables were required for the step. Hence the additional cost involved in the same was also negligible.

CONCLUSION

The greater palatine nerve block as an additional measure during the septoplasty surgery done under local anesthesia gives a significantly reduced and effective post-operative pain control for prolonged duration. This can be utilized as an added step of the septoplasty surgery utilizing the same drug along with local infiltration and give a simple, cost effective and safe addition for a comfortable pain free post-operative period. The technique of this nerve block added to the armamentarium of the otolaryngologist will aid him in better outcomes of patient comfort post nasal surgeries. Further studies on the greater palatine nerve block during surgeries done under GA as well as other nasal surgeries will validate its efficacy in prolonged pain control benefitting the patients.

ACKNOWLEDGEMENTS

Consultants in the department of ENT of our hospital, resident doctors and most importantly all the patients of this study are duly acknowledged for their cooperation and support in the successful conduct of the study.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Cho DY, Drover DR, Nekhendzy V, Butwick AJ, Collins J, Hwang PH. The effectiveness of preemptive sphenopalatine ganglion block on postoperative pain and functional outcomes after functional endoscopic sinus surgery. *Int Forum Allergy Rhinol.* 2011;1(3):212-8.
2. Douglas R, Wormald P. Pterygopalatine Fossa Infiltration Through the Greater Palatine Foramen: Where to Bend the Needle. *The Laryngoscope.* 2006;116:1255-7.
3. Kinney MKA, Stadler ME, Wong YT. Transpalatal greater palatine canal injection: Radioanatomic analysis of where to bend the needle for pediatric sinus surgery. *Am J Rhinol Allergy.* 2010;24(5):385-8.
4. Brandon K, Nguyen, Yuhon BT, Folbe E, Eloy JA, Giancarlo F et al. Perioperative Analgesia for Patients Undergoing Septoplasty and Rhinoplasty: An Evidence-Based Review. *Laryngoscope.* 2018;129(6):200-12.
5. Ekici NY, Alagoz S. The effectiveness of endoscopic sphenopalatine ganglion block in management of postoperative pain after septal surgery. *Int Forum Allergy Rhinol.* 2019;9(12):1521-5.
6. Chitra C, Mala R. Study comparing the analgesic efficacy of anterior ethmoidal nerve block with greater palatine nerve block and topical anaesthesia for septal and endoscopic sinus surgeries. *Indian J Applied Res.* 2018;8(3):36-8.
7. Fujiwara T, Kuriyama A, Kato Y, Fukuoka T, Ota E. Perioperative local anaesthesia for reducing pain following septal surgery (Review). *Cochrane Database Syst Rev.* 2018;8:012047.
8. Rezaeian A, Hashemi SM, Dokhanchi ZS. Effect of sphenopalatine ganglion block with bupivacaine on postoperative pain in patients undergoing endoscopic sinus surgery. *Allergy Rhinol (Providence).* 2019;10:1-5.
9. Maria SD, Govindaraj S, Chinosorvatana N, Kang S, Levine AI. Bilateral sphenopalatine ganglion blockade improves postoperative analgesia after endoscopic sinus surgery. *Am J Rhinol Allergy.* 2012;26(1):23-7.
10. Kim DH, Kang H, Hwang SH. The effect of sphenopalatine block on the postoperative pain of

endoscopic sinus surgery: A Meta-analysis. *Otolaryngol Head Neck Surg.* 2019;160(2):223-31.

11. Syed AM, Wong JD, Donkor P, Horan J, Rix L, Curtin J et al. Complications associated with maxillary nerve block anaesthesia via the greater palatine canal. *Aust Dent J.* 1992;37(5):340-5.

Cite this article as: Madesh KR, Sahu PK, Arjun AP, Vallur S, Pyadala N. Comparison of postoperative analgesia between greater palatine nerve block with local infiltration and local infiltration alone in septoplasty surgeries. *Int J Otorhinolaryngol Head Neck Surg* 2020;6:759-64.