



ORIGINAL RESEARCH PAPER

Anaesthesiology

A COMPARATIVE STUDY OF GLOSSOPHARYNGEAL NERVE BLOCK AND PERITONSILLAR INFILTRATION FOR POST OPERATIVE PAIN AFTER TONSILLECTOMY

KEY WORDS: tonsillectomy, glossopharyngeal nerve block, peritonsillar infiltration.

Dr. Mukesh Kumar*

Senior Resident, Deptt. of Anesthesiology, RIMS Ranchi *Corresponding Author

Dr. Harish Kumar

Senior Resident, Deptt. of Anesthesiology, RIMS Ranchi

Dr. Ladhu Lakra

Associate Professor, Deptt. of Anesthesiology, RIMS Ranchi

Dr. Rajesh Chandra

Senior Resident, Deptt. of Anesthesiology, DMC Ludhiana

ABSTRACT

Introduction: Postoperative pain is the principal cause of morbidity after tonsillectomy. Glossopharyngeal nerve block is a useful method for the palliation of post tonsillectomy pain. Infiltration of tonsillar bed with local anaesthetic has been used in past for early post-operative analgesia after the tonsillectomy
Aim & Objectives: To assess the efficacy of Glossopharyngeal nerve block with that of peritonsillar infiltration for control of pain in immediate postoperative period after tonsillectomy.
Method: ASA 1–2 physical status patients undergoing tonsillectomy between age 7-35yrs were recruited for this prospective randomised study under general anesthesia. Patients were randomly assigned two groups each of 25 patients.
Group GNB-bilateral GNB using 0.25% bupivacaine with 1:200,000 epinephrine (3ml on each side).
Group PTI-bilateral peritonsillar infiltration using 0.25% bupivacaine with 1:200,000(3ml on each side).
Result: Both the techniques provided good early postoperative analgesia although the effect of Glossopharyngeal nerve block were prolonged than infiltration.

INTRODUCTION

Tonsillectomy is one of the most frequently performed ambulatory surgical procedures and can cause severe pain postoperatively, Glossopharyngeal nerve block is a useful method for the palliation of post tonsillectomy pain. An obtunded gag reflex response may be a clinical indicator for analgesia from Glossopharyngeal nerve block.

Infiltration of tonsillar bed with local anaesthetic has been used in past for early post-operative analgesia after the tonsillectomy.

Our prospective, randomized study is designed to assess the efficacy and safety of of Glossopharyngeal nerve block with that of peritonsillar infiltration for the control of pain experienced by the patients in the immediate postoperative period after tonsillectomy.

AIMS AND OBJECTIVES

To compare Glossopharyngeal Nerve Block and Peritonsillar Infiltration techniques regarding -

1. Analgesic efficacy,
2. Relation between extent of obtunded gag reflex and analgesia,
3. Safety of two techniques.

MATERIAL AND METHODS

The study was prospective, randomized clinical trial. The study was done on adult patients of American Society of Anaesthesiologist (ASA) grade I or II undergoing tonsillectomy. Patients were randomly assigned to one of the two groups each of 25 patients according to computer generated random number table

Group GNB- At the end of surgery, bilateral GNB was given by the anaesthetist by using 0.25% bupivacaine with 1:200,000 epinephrine (3ml on each side).

Group PTI-At the end of surgery bilateral peritonsillar infiltration was given by the surgeon using 0.25% bupivacaine with 1:200,000(3ml on each side).

During the preoperative visit, patients were instructed how to express pain on a 10-mm verbal analog scale (VAS).

On arrival in the PACU, following observation was noted :

1. Time to awaken (from the end of anaesthesia until the patients opened their eyes on command.
2. Time to the first request for analgesia.
3. Total dose of analgesia required in all patients.
4. Pain at rest on VAS scale.
5. Pain on swallowing on the VAS scale.
6. Pain on first liquid diet at 4th hr. on the VAS scale was recorded.

Gag reflex response was evaluated in patients >15yrs by lightly touching the posterior wall of the lower part of the oropharynx with a tongue depressor. The gag reflex response was objectively assessed according to our artificial scale:

1. None: no response
2. Mild: grimace but tolerable
3. Moderate: facial flushing
4. Severe: facial flushing with cough or lacrimation or restlessness.

The extent of difficulty in swallowing was also be assessed on a 4-point artificial scale:

1. None: normal or no difficulty in swallowing
2. Mild: mild difficulty in swallowing
3. Moderate: moderate difficulty in swallowing
4. Severe: no swallowing or swallowing only with maximal effort

STATISTICAL ANALYSIS

A study population of 25 patients for each group was determined to have 80% power at $\alpha = 0.05$ (two-tailed) to detect a difference of 10% in reducing the VAS pain score after the tonsillectomy in GNB group than PTI group.

Data were expressed as mean \pm SD. After the study, analysis of data done by using Chi square test and independent t test. P value <0.05 was considered statistically significant.

OBSERVATIONS & RESULTS

the mean age in Group GNB was 14.40 \pm 6.062 years and group PTI was 14.80 \pm 6.614 years calculated by using independent t test which is **statistically insignificant** ($p > 0.05$).

Age Distribution of Patients

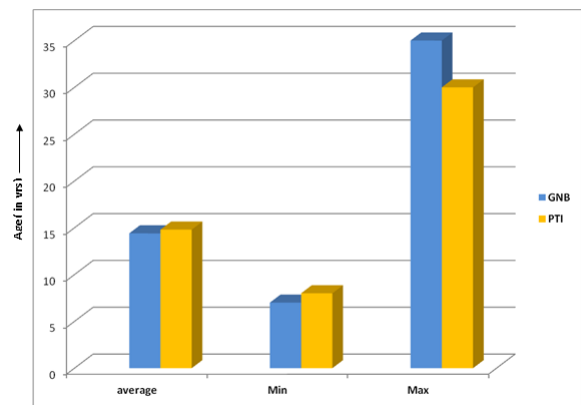


Figure-1

Table-2 Sex Distribution Between Two Groups

Gender	ALL	GNB	PTI	Pearson Chi-Square value	Pvalue
Male	24 (48%)	14(56%)	10(40%)	0.720	0.396
Female	26(52%)	11(44%)	15(60%)		

The study had 25 subjects in each group, out of which there were 14 males and 11 females in GNB group, while in PTI group there were 10 males and 15 females, revealed that sex distribution is statistically insignificant ($p>0.05$) by using chi-square test.

Table 4 - Duration of surgery Distribution

Variable		GNB	PTI	P-value
Duration of Sx (min)	Mean	42.60	41.60	0.978
	S.D.	8.554	8.382	

Above table shows that two groups are comparable in terms of duration of surgery and statistically insignificant ($p>0.05$) by using independent t test.

Table-5 Time to Awaken Distribution

Variable		GNB	PTI	P-value
Time to Awaken (min)	Mean	8.28	7.80	0.818
	S.D.	0.980	1.633	

Above table shows that two groups are comparable in terms of duration of surgery and statistically insignificant ($p>0.05$) by using independent t test. the baseline and intra operative pulse rate of patients in both groups were comparable and statistically insignificant at all the time interval ($p>0.05$) by using independent t test.

INTRAOPERATIVE PULSE RATE

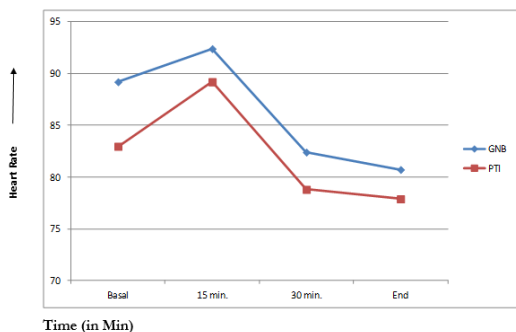


Figure-2

the baseline and intra operative pulse rate of patients in both groups were comparable and statistically insignificant at all the time interval ($p>0.05$) by using independent t test.

Intra operative Mean Arterial Pressure

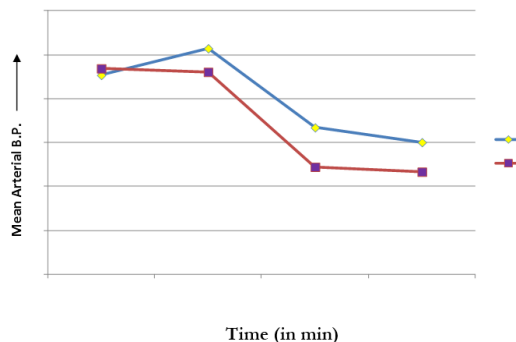


Figure-3

Reduced VAS scores at rest were seen in both the group up to 4hrs after surgery and statistically significant ($p>0.05$). After 4 hrs the VAS scores were significantly lower in GNB group compared to PTI group difference up to 8th hour ($p<0.001$). At 24th hour, both groups were comparable in pain scores and statistically insignificant ($p>0.05$) by using independent t test.

Pain Score at Rest

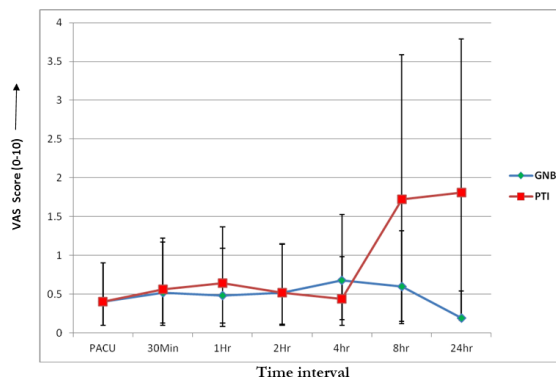


Figure-4

Reduced VAS scores were seen on swallowing in both the group up to 2hr and there was no statistically significance ($p>0.05$). after that there was significant difference up to 8hrs ($p<0.001$), VAS score is less in GNB group. Then after up to 24hrs, both groups were comparable in VAS scores and statistically insignificant ($p>0.05$) by using independent t test.

Pain Score on Swallowing

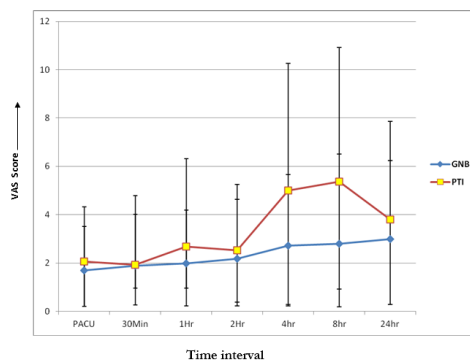


Figure - 5

VAS score were lower in GNB group than PTI group at 4thhr on having first liquid diet and difference was **statistically significant** ($p < 0.001$) by using independent t test.

Pain Score on Liquid Diet

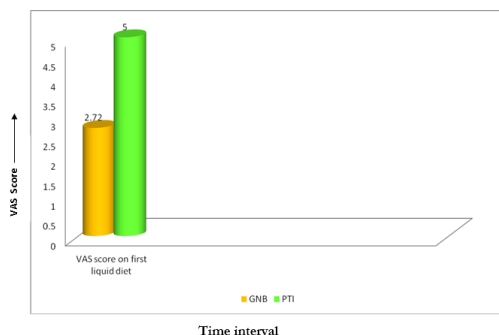


Figure - 5

Within 30 min of surgery, 1 patient required rescue analgesia in GNB group, while in PTI group no patient required analgesia and the difference was **statistically insignificant** ($p > 0.05$) by using chi square test.

Then after up to 4th hr 1 patient required rescue analgesia in GNB group, while in PTI group 8 patients required rescue analgesia and the difference was **statistically significant** ($p < 0.05$) by using chi square test.

Then after up to 8th hr, 3 patient required rescue analgesia in GNB group, while in PTI group 8 patients required rescue analgesia and the difference was **statistically significant** ($p < 0.05$) by using chi square test.

Then after up to 24th hr 3 patients required rescue analgesia in GNB group, while in PTI group 3 patient required rescue analgesia and the difference was **statistically insignificant** ($p > 0.05$) by using chi square test.

No. of Patients Required Analgesia

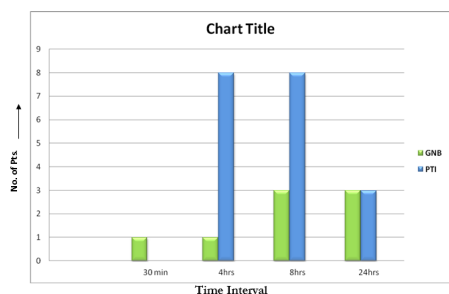


Figure - 6

Time for first request for analgesia was quite prolonged in GNB group in comparison to PTI group but **statistically significant** ($p < 0.05$) by using independent t test.

Time of Request for 1st Analgesia

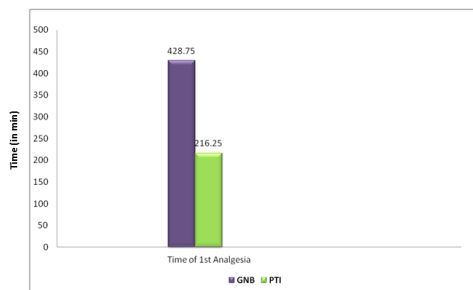


Figure - 7

Total dose of analgesia was comparable in both the group and **statistically insignificant** ($p > 0.05$) by using independent t test.

Total Dose of Analgesia

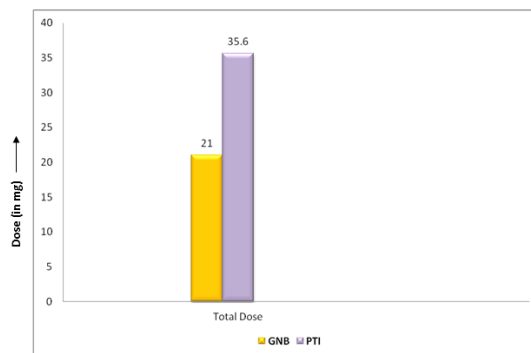


Figure-8

Both the groups were comparable to each other in adverse events and **statistically insignificant** ($p > 0.05$) by using independent t test.

Dyspnea was found in one patient of GNB group. Both the groups were comparable to each other and **statistically insignificant** at all the time interval ($p > 0.05$) by using independent t test.

Swallowing Difficulty

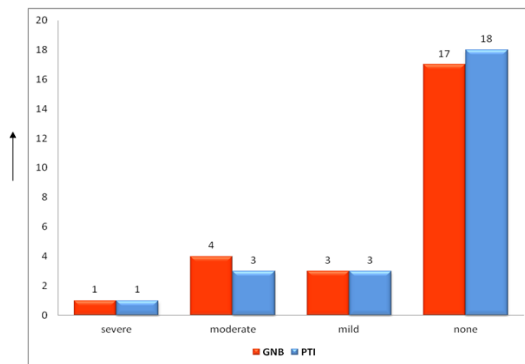


Figure-9

Response to gag reflex observed in GNB group pts (>15yrs).

The degree of obtunded gag reflex was used as a clinical indicator to assess how successfully the glossopharyngeal nerve was blocked.

Above table shows that 80% pts had no or mild response to gag reflex and 20% had moderate response and no one had severe response. Response to gag reflex decreases after successful GNB, Our results indeed demonstrated a strong relationship between the extent of the obtunded gag reflex and the extent of post tonsillectomy pain.

Response to Gag Reflex

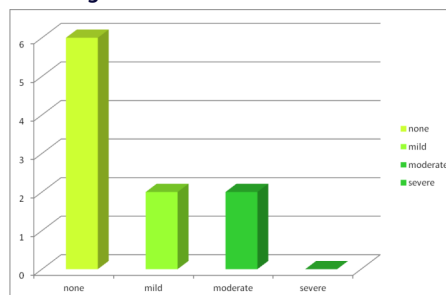


Figure-10

DISCUSSION

In our study the patients who received Glossopharyngeal nerve block had reduced VAS score at rest, on swallowing at PACU and on having first liquid diet, at each time of observation. Whereas in PTI group the VAS scores were reduced both at rest, on swallowing and at the time of first liquid diet up to 4hrs, thereafter the VAS scores were higher than GNB group.

VAS scores were significantly lower in GNB group than PTI group on having first liquid diet at 4hrs after surgery ($p < 0.001$).

Our result were in agreement with many previous study shown short lasting effect after infiltration local anaesthetic. Selter K et al (2009) assessed the effect of post-incisional infiltration of tonsillar fossae with 0.5% bupivacaine and found that post-incisional infiltration had a better pain relief than pre-incisional infiltration. Johansen et al.(1996) injected 5ml of 0.25% bupivacaine solution in the case group and equal amount of normal saline in the control group. Afterwards, they assessed the pain after surgery by visual analogue score (VAS) and compared the efficacy of oral analgesic after surgery between the two groups. Findings were consistent with less pain and lower use of analgesics in the case group ($p < 0.001$) but the study population were not enough. Studies by Alvarez et al(1997), Wong et al (1995) and Jebeles et al(1993) showed the efficacy of pre-incisional injection of this drug around tonsillar tissues in reducing the pain after surgery.

In terms of adverse events both the groups were comparable to each other in adverse events and statistically significant difference was not found except in one patient which had dyspnea in GNB group.

Our results are in agreement with many studies used infiltration technique[Nordahl et al (1999), Strub et al (1996), Orntoft et al(1994), Schoem et al (1993)] Complications of bupivacaine have been rarely reported in these studies.

In our study one patient had dyspnea and stridor in the GNB group after the extubation. The patient improved within 15 min with oxygen supplement and respiratory support only.

CONCLUSION AND SUMMARY

Both the techniques provided good early postoperative analgesia although the effect of Glossopharyngeal nerve block were prolonged than infiltration. First liquid was tolerated by patients in both the groups. we advocate use of Glossopharyngeal nerve block in patients undergoing tonsillectomy. The block is easy to learn and relatively safe.

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