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Original Article

Anaesthesia Section

Ultrasound-guided Greater Auricular Nerve Block versus Intravenous Diclofenac for Postoperative Analgesia in Tympanomastoid Surgery under General Anaesthesia: A Randomised Controlled Trial

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ABSTRACT

Introduction: Tympanomastoid surgery is associated with significant postoperative pain due to extensive soft-tissue and periosteal manipulation. Effective analgesia is needed to enhance recovery and reduce complications.

Materials and Methods: This randomised controlled study included 70 patients undergoing tympanomastoid surgery under general anaesthesia. Patients were allocated into two groups: Group G received an ultrasound-guided Greater Auricular Nerve Block (GANB) with 5 mL of 0.25% bupivacaine, and Group C received intravenous diclofenac 75 mg, both interventions were administered before extubation. Postoperative haemodynamic parameters, Visual Analogue Scale (VAS) scores, rescue analgesia requirements, total analgesic consumption, and adverse effects were assessed and compared between groups. Data were analysed using mean±standard deviation, paired and unpaired t-tests for quantitative variables, Chi-square test for qualitative variables, and $p<0.05$ was considered statistically significant.

Results: A total of 70 patients were enrolled, with 35 patients in each group. Demographic variables, including age, gender, Body Mass Index (BMI), and American Society of Anaesthesiologists (ASA) status, were comparable between the groups ($p>0.05$). Mean postoperative VAS scores were significantly lower in group G compared to group C at all intervals (0 min: 0.40±0.55 vs 1.71±1.20; 30 min: 0.97±1.04 vs 4.20±1.38; 1 h: 1.34±1.10 vs 3.51±1.42; $p<0.001$). Total rescue analgesia requirement was lower in group G (1.60±1.00 vs 2.94±0.48; $p<0.001$). Mean MAP at extubation was lower in group G (98.94±3.02 vs 102.14±2.87; $p<0.001$), indicating better haemodynamic stability. Nausea, vomiting, and headache were more frequent in group C, whereas transient tingling sensations and soreness at the injection site were observed only in group G.

Conclusion: Group G demonstrated superior postoperative analgesia, better haemodynamic stability, and lower rescue analgesic requirement compared to group C in patients undergoing tympanomastoid surgery under general anaesthesia. Ultrasound-guided GANB was found to be a safe and effective component of multimodal analgesia with minimal adverse effects.

Keywords: Ear surgery, Haemodynamic stability, Multimodal pain management, Perioperative analgesia, Regional anaesthesia

INTRODUCTION

Timely and effective postoperative analgesia is a crucial component of perioperative care in patients undergoing tympanomastoid surgery. These procedures involve extensive manipulation of the external and middle ear structures, mastoid air cells, periosteum, and surrounding soft tissues, all of which are richly innervated and highly sensitive to nociceptive stimulation [1,2]. Surgical incision and dissection in the postauricular region frequently result in moderate-to-severe postoperative pain, particularly during the early postoperative period. Inadequate pain control may lead to sympathetic overactivity, increased catecholamine release, elevated stress hormone levels, agitation, anxiety, sleep disturbances, delayed mobilisation, prolonged hospital stay, increased rescue analgesic consumption, and poor patient satisfaction [3,4].

Postoperative pain management in otologic surgeries remains challenging because the ideal analgesic technique should provide effective pain relief while minimising adverse effects and facilitating early recovery. Traditionally, systemic opioids and Non Steroidal Anti-Inflammatory Drugs (NSAIDs) have been used for pain control after ear surgeries. Although opioids provide effective analgesia, their use is associated with several adverse effects, such as Postoperative Nausea and Vomiting (PONV), sedation, respiratory depression, dizziness, and delayed recovery [5,6]. In tympanomastoid surgeries, PONV is particularly undesirable because forceful vomiting may increase middle ear pressure, compromise graft integrity, precipitate bleeding, and negatively affect surgical outcomes [7]. NSAIDs such as diclofenac are widely used as part of multimodal analgesia due to their opioid-sparing properties and anti-inflammatory effects. Diclofenac acts by inhibiting cyclooxygenase enzymes and reducing prostaglandin synthesis, thereby providing analgesia and decreasing inflammation. However, systemic NSAID administration may also be associated with gastrointestinal irritation, renal dysfunction, platelet inhibition, and cardiovascular adverse effects, especially with repeated administration or in susceptible individuals [8].

Enhanced Recovery After Surgery (ERAS) protocols emphasise multimodal analgesia strategies aimed at reducing opioid consumption and improving perioperative outcomes [9]. Consequently, regional anaesthesia techniques have gained increasing popularity because they provide targeted analgesia with fewer systemic side effects. Peripheral nerve blocks reduce nociceptive transmission at the surgical site, attenuate the surgical stress response, improve haemodynamic stability, and decrease postoperative analgesic requirements [10]. Among the available regional techniques for

otologic procedures, the GANB has emerged as a promising, relatively simple approach.

The greater auricular nerve arises from the cervical plexus, predominantly from the C2 and C3 spinal nerve roots, and supplies sensation to the auricle, mastoid region, parotid area, and skin overlying the angle of the mandible [11]. As these areas are commonly involved in tympanomastoid surgeries, blockade of this nerve can provide effective perioperative analgesia. The superficial anatomical course of the nerve along the posterior border of the sternocleidomastoid muscle makes it accessible for ultrasound-guided blockade [11,12]. Ultrasound guidance further improves the safety and efficacy of peripheral nerve blocks by enabling direct visualisation of neural structures, surrounding vessels, and local anaesthetic spread in real time, thereby reducing complications and improving block accuracy [12,13].

Several studies have evaluated the efficacy of GANB in otologic surgeries. Gautam D et al., demonstrated significantly lower postoperative pain scores and reduced rescue analgesic requirements in patients receiving GANB during tympanomastoid surgery [10]. Chaudhari T et al., similarly reported prolonged postoperative analgesia and improved patient comfort with GANB [13]. Ökmen K et al., compared ultrasound-guided superficial cervical plexus block with GANB and found both techniques effective in reducing postoperative pain following tympanomastoid surgeries [14]. Despite these encouraging findings, several gaps remain in the literature. Most available studies have compared GANB with opioid-based analgesic techniques rather than with routinely used non-opioid analgesics such as intravenous diclofenac. Additionally, many previous studies had relatively small sample sizes, short follow-up durations, or primarily evaluated pain scores without detailed assessment of haemodynamic responses and postoperative rescue analgesic requirements [15-18].

More recently, Mishra V et al., observed reduced postoperative opioid consumption and superior analgesia with GANB when compared with intravenous fentanyl [16]. Ayudha R et al., and Li TT et al., also reported that GANB significantly reduced intraoperative fentanyl requirements, postoperative pain scores, and analgesic consumption in mastoid surgeries [17,18].

Limited literature is available comparing ultrasound-guided GANB with intravenous diclofenac specifically in patients undergoing tympanomastoid surgery under general anaesthesia [10,13-18]. Furthermore, evidence regarding the haemodynamic benefits and safety profile of GANB in this surgical population remains inadequate. Hence, the present randomised controlled trial was conducted to compare the efficacy of ultrasound-guided GANB with intravenous diclofenac in improving postoperative analgesia and haemodynamic stability following tympanomastoid surgery under general anaesthesia. The primary objective was to evaluate postoperative haemodynamic stability, which was assessed using Heart Rate (HR), Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), Mean Arterial Pressure (MAP), and Oxygen Saturation (SpO_2). The secondary objectives included assessing postoperative VAS scores, total rescue analgesic requirement over 12 hours, and postoperative adverse effects or complications.

MATERIALS AND METHODS

This randomised controlled study was conducted in the Department of Anaesthesiology at Dr. D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune, from January 2025 to February 2026, after obtaining Institutional Ethics Committee approval (IESC/PGS/2024/147), written informed consent from all participants, and registration with the Clinical Trials Registry-India (CTRI/2025/02/080227).

Sample size calculation: Based on the study conducted by Gautam D et al., the mean postoperative VAS scores in the GANB group and control group were 3.74±2.61 and 5.60±1.96, respectively [10]. Considering a 95% confidence interval ($Z\alpha/2=1.96$) and 90% power ($Z1-\beta=1.28$), the mean difference between the groups was 1.86 with standard deviations of 2.61 and 1.96, respectively. Sample size was calculated using the above parameters in the formula given below:

$$n = \frac{(Z_{\alpha/2} + Z_{1-\beta})^2 (\sigma_1^2 + \sigma_2^2)}{(\mu_1 - \mu_2)}$$

$\sigma_1=2.61$, $\sigma_2=1.96$

$\mu_1=3.74$, $\mu_2=5.60$

Substituting the values:

$$n = \frac{(1.96 + 1.28)^2 \times \{(2.61)^2 + (1.96)^2\}}{(5.60 - 3.74)^2}$$

$$n = \frac{10.49 \times 10.65}{3.46}$$

$$n = 32.3$$

Thus, the calculated sample size was approximately 33 patients per group. After rounding off and accounting for possible dropouts, 35 patients were included in each group, giving a total sample size of 70 patients. The sample size was calculated using WinPEPI software version 11.65.

Inclusion criteria: Patients with ASA physical status I and II, who were haemodynamically stable with routine investigations within normal limits and willing to provide written informed consent, were included in the study.

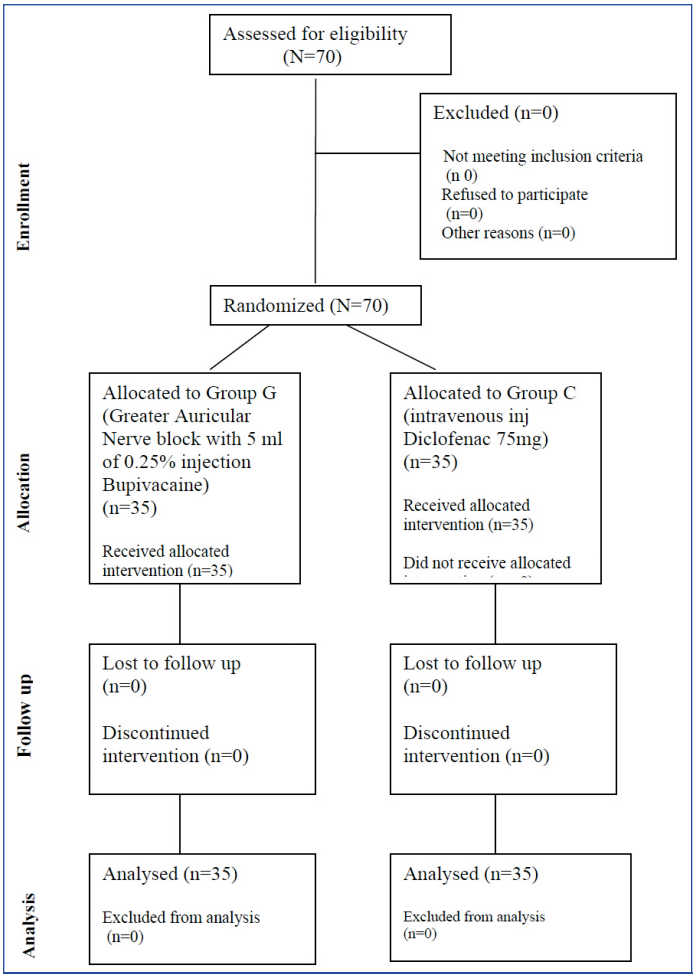
Exclusion criteria: Patients with bleeding disorders or on anticoagulants, facial nerve palsy, infection, trauma or skin lesions at the block site, known allergy to study drugs, neurological or psychiatric illness affecting VAS assessment, unwilling patients, and those with ASA physical status III or above were excluded from the study.

Sample size: A total of 70 patients fulfilling the eligibility criteria were included in the study and randomised into two groups of 35 each. No patients were excluded after enrollment.

Patients were randomised into two groups of 35 each using a computer-generated random number sequence generated by an independent anaesthesiologist not involved in patient management. Allocation concealment was ensured using sequentially numbered opaque sealed envelopes. Owing to the nature of the interventions, participant blinding was not feasible; however, to minimise bias, postoperative assessment of haemodynamic parameters, VAS scores, rescue analgesia requirements, and adverse effects was performed by an anaesthesiologist blinded to group allocation. The anaesthesiologist performing the block was not involved in postoperative data collection, and standardised anaesthesia, monitoring, and analgesia protocols were followed in all patients. The Consolidated Standards of Reporting Trials (CONSORT) flow diagram of patient enrollment and allocation is shown in [Table/Fig-1].

Study Procedure

Pre-anaesthetic evaluation was performed on the day before surgery, during which a detailed history was taken and significant complaints noted. The procedure for GANB was explained to the patient, and written informed consent was obtained. General and systemic examinations were performed, including assessment of the GAN block site for any local infection. Routine laboratory values were checked. Patients were evaluated for routine investigations, including Complete Blood Counts (CBC), renal and liver function tests, serum electrolytes, PT-INR, and random blood sugar, along with baseline vitals, before shifting to the operating theatre. Before surgery, all patients were kept nil per os for at least six hours.



[Table/Fig-1]: Consolidated standards of reporting trials (CONSORT) chart of patients.

A total of 70 patients between the ages of 18 and 65 years, classified as ASA I or II, haemodynamically stable, were enrolled and randomly assigned into two groups of 35 each -

- Group G received GANB with 5 mL of 0.25% injection Bupivacaine before extubation.
- Group C received injection Diclofenac 75 mg in 100 mL normal saline before extubation [19].

Once the patient was shifted to the operating theatre, monitors, including NIBP, ECG, and pulse oximetry, were attached, and baseline values were recorded. All patients were given general anaesthesia. Preoxygenation with 100% oxygen for three minutes was given, followed by premedication with intravenous glycopyrrolate 0.004 mg/kg, midazolam 0.02 mg/kg, and fentanyl 2 mcg/kg. Induction was done with intravenous propofol 2 mg/kg. Injection succinylcholine 2 mg/kg was administered once the patient was able to ventilate. Tracheal intubation was performed by smooth and gentle laryngoscopy by an experienced anaesthesiologist using a single-use sterile endotracheal tube of 7-7.5 mm internal diameter for females and 8-8.5 mm for males. Injection of vecuronium 0.1 mg/kg was given as an initial bolus. Anaesthesia was maintained uniformly in all patients using oxygen, nitrous oxide, and sevoflurane along with intermittent intravenous vecuronium to avoid variability in anaesthetic depth and haemodynamic response. Half an hour before the completion of surgery, intravenous ondansetron 4 mg was administered to prevent PONV in both groups.

For GANB, the head was turned to the opposite side of the operated ear. The nerve was identified deep and medial to the sternocleidomastoid muscle near its dorsal border using ultrasound guidance. The high-frequency linear ultrasound transducer was adjusted at a slight angle to facilitate clear identification of its deep course. The nerve was visualised as a round or oval hypoechoic structure, both deep and superficial to the sternocleidomastoid muscle. The superficial portion at Erb's point was identified, where it pierced the superficial cervical fascia. The nerve was traced to its bifurcation to ensure the injection was given proximal to it. The nerve was blocked at the superficial level, where it winds around the posterior border of the sternocleidomastoid muscle, using 5 mL of 0.25% bupivacaine to achieve selective blockade. A 22-G cannula with a facet tip and extension tubing was used under sterile precautions.

At the end of surgery, the oropharynx was gently suctioned, and the patient was reversed using intravenous neostigmine 0.05 mg/kg and glycopyrrolate 0.008 mg/kg once adequate expiratory efforts were present. Tracheal extubation was performed similarly in both groups after complete recovery when the patients were fully awake. Vital parameters were noted again. After extubation, patients were shifted to the postoperative room for observation and further assessment.

Parameters observed: The primary outcome measure was postoperative haemodynamic stability assessed using HR, SBP, DBP, MAP, and SpO_2. These parameters were recorded preoperatively, at the end of surgery, during extubation, immediately postoperatively (0 min), and at 30 minutes, one hour, six hours, and 12 hours postoperatively. Secondary outcome measures included postoperative VAS scores, time to first rescue analgesia, total rescue analgesic requirement over 12 hours, and postoperative adverse effects or complications. VAS scores and rescue analgesic requirements were assessed immediately postoperatively and at 30 minutes, one hour, six hours, and 12 hours postoperatively, while adverse effects were monitored throughout the 12-hour postoperative period. Intravenous paracetamol 1g was administered as rescue analgesia whenever the VAS score exceeded 4.

STATISTICAL ANALYSIS

All cases were completed within the stipulated time. Data was collected, compiled, and tabulated. Data for different parameters were summarised using the arithmetic mean and standard deviation. Quantitative data were compared using a t-test, an unpaired t-test for intergroup and a paired t-test for within-group comparisons. The Chi-square test analysed qualitative parameters. A $p<0.05$ was considered statistically significant.

RESULTS

All 70 patients completed the study and were included in the final analysis [Table/Fig-1]. No significant abnormalities were detected in the preoperative laboratory investigations of the enrolled patients. The following were the observations of the present study:

Demographic characteristics, including age, gender distribution, height, weight, BMI, and ASA physical status, were comparable between the two groups, with no statistically significant difference observed ($p>0.05$), indicating baseline homogeneity between the study groups [Table/Fig-2].

Parameters	Group G (Mean±SD)	Group C (Mean±SD)	p-value
Age (in years)	39.51±11.32	39.05±10.47	0.861
Gender (M/F)	18/17	17/18	0.811
Height (cm)	164.88±6.91	165.05±6.42	0.914
Weight (kg)	65.68±7.45	66.42±8.56	0.700
BMI (kg/m²)	24.09±1.44	23.99±1.55	0.787
ASA (I/II)	16/19	17/18	0.821

[Table/Fig-2]: Comparison of demographic characteristics between Group G and Group C.
$p<0.05$ was considered statistically significant. BMI: Body mass index; ASA: American Society of Anaesthesiologists physical status classification; M: Male; F: Female; SD: Standard deviation

Haemodynamic parameters, including HR, SBP, DBP, and MAP, were comparable preoperatively and at the end of surgery. However, during extubation and the postoperative period,

group G demonstrated significantly better haemodynamic stability with lower SBP, DBP, and MAP values compared to group C at multiple time intervals (p<0.05) [Table/Fig-3]. SpO_2 remained comparable between the groups throughout the study period, with no episodes of desaturation observed in either group [Table/Fig-4].

Postoperative VAS scores were significantly lower in group G at all assessed intervals compared to group C (p<0.001), indicating superior postoperative analgesia with ultrasound-guided GANB [Table/Fig-5].

Rescue analgesic requirement was also significantly lower in group G at 30 minutes, one hour, six hours, and 12 hours postoperatively, with reduced total rescue analgesic consumption over 12 hours compared to group C (p<0.001) [Table/Fig-6].

Postoperative adverse effects were minimal and comparable between the groups. Nausea, vomiting, and headache were more frequent in group C, whereas transient tingling sensation and soreness at the injection site were observed only in group G. All adverse effects were mild, self-limiting, and managed conservatively without any major complications [Table/Fig-7].

DISCUSSION

Tympanomastoid surgery is associated with significant postoperative pain due to extensive soft-tissue and periosteal manipulation in a richly innervated region [1,2]. Effective postoperative analgesia is therefore essential to improve recovery, reduce stress response, and enhance patient comfort [3,4].

The demographic characteristics of patients in both groups were comparable with respect to age, gender distribution, body mass index, height, weight, and ASA physical status, indicating baseline homogeneity and reducing the likelihood of confounding. Similar demographic comparability has been reported by Gautam D et al., Chaudhari T et al., Liu J et al., and Mishra V et al., [10,13,15,16]. The similarity in baseline characteristics across these studies suggests that the observed differences in postoperative outcomes can be

Time interval	Heart rate (beats/min) (Mean±SD)	p-value	Systolic blood pressure (mmHg) (Mean±SD)	p-value	Diastolic blood pressure (mmHg) (Mean±SD)	p-value	Mean arterial pressure (mmHg) (Mean±SD)	p-value
	Group G / Group C		Group G / Group C		Group G / Group C		Group G / Group C	
Preoperative	78.14±4.48 / 77.74±3.58	0.6810	119.62±4.33 / 120.88±5.08	0.2693	75.65±3.98 / 77.34±4.02	0.1826	89.94±3.05 / 91.54±3.68	0.252
End of surgery	75.42±4.37 / 76.82±3.64	0.1503	118.25±3.17 / 117.77±4.37	0.6580	73.05±3.51 / 74.48±3.97	0.1157	87.82±2.86 / 88.54±3.34	0.340
Extubation	89.94±3.53 / 91.22±3.60	0.1364	131.17±5.48 / 133.71±5.02	0.0470*	83.31±3.84 / 86.80±3.18	p<0.001	98.94±3.02 / 102.14±2.87	<0.001
Immediate postoperative	85.20±3.56 / 87.97±3.82	0.0025*	128.11±5.06 / 129.97±5.46	0.1458	81.62±3.89 / 85.37±3.63	p<0.001	96.80±3.19 / 99.85±2.93	<0.001
30 minutes	82.68±3.28 / 84.02±3.08	0.0823	123.45±4.55 / 124.88±5.14	0.2232	78.08±3.68 / 79.40±3.50	0.1308	92.85±2.66 / 94.22±2.90	0.0434*
1 hour	77.68±3.70 / 80.71±3.90	0.0014*	119.91±4.16 / 122.80±4.93	0.0102*	76.08±3.55 / 78.71±3.94	0.0046*	90.37±2.50 / 93.05±3.43	0.00041*
6 hours	74.05±4.56 / 75.74±3.98	0.1048	116.02±4.21 / 120.62±4.81	0.00007*	73.28±3.68 / 76.40±4.02	0.0012*	87.14±2.93 / 90.82±3.20	<0.0001*
12 hours	72.08±3.25 / 73.02±3.37	0.2384	116.08±4.96 / 118.45±4.52	0.0404*	71.22±3.78 / 74.05±3.62	0.0021*	85.82±2.94 / 88.54±2.94	<0.001

[Table/Fig-3]: Comparison of postoperative haemodynamic parameters between group G and group C.
p<0.05 was considered statistically significant.HR: Heart rate; SD: Standard deviation.

Time interval	Group G (Mean±SD)	Group C (Mean±SD)	p-value
Preoperative	99.11±0.68	99.05±0.72	0.718
End of surgery	99.00±0.76	98.91±0.70	0.604
Extubation	98.77±0.73	98.68±0.76	0.617
Immediate postoperative	98.82±0.71	98.62±0.77	0.263
30 minutes	98.94±0.66	98.74±0.70	0.220
1 hour	99.00±0.59	98.82±0.64	0.224
6 hours	99.14±0.55	98.97±0.62	0.229
12 hours	99.22±0.49	99.05±0.60	0.204

[Table/Fig-4]: Comparison of oxygen saturation (SpO2) between group G and group C.
p<0.05 was considered statistically significant; SpO2: Peripheral oxygen saturation; SD: Standard deviation.

Time Interval	Group G (Mean±SD)	Group C (Mean±SD)	p-value
Immediate postoperative	0.40±0.55	1.71±1.20	<0.001*
30 minutes	0.97±1.04	4.20±1.38	<0.001*
1 hour	1.34±1.10	3.51±1.42	<0.001*
6 hours	4.22±1.43	5.62±1.35	0.00008*
12 hours	3.08±1.56	4.97±1.74	<0.001*

[Table/Fig-5]: Comparison of postoperative Visual Analogue Scale (VAS) scores between group G and group C.
p<0.05 was considered statistically significant; ‡ VAS: Visual analogue scale; SD: Standard deviation

Time interval	Group G (Mean±SD)	Group C (Mean±SD)	p-value
Immediate postoperative	0.00±0.00	0.00±0.00	1.000
30 minutes	0.02±0.16	0.65±0.48	<0.001*
1 hour	0.02±0.16	0.51±0.50	<0.001*
6 hours	0.65±0.48	0.94±0.23	<0.001*
12 hours	0.37±0.49	0.80±0.40	<0.001*
Total rescue analgesia requirement over 12 hours	1.60±1.00	2.94±0.48	<0.001*

[Table/Fig-6]: Comparison of rescue analgesia requirement between group G and group C.
p<0.05 was considered statistically significant; SD: Standard deviation.

Adverse effects	Group G n (%)	Group C n (%)	p-value
No adverse effects	27 (77.14)	29 (82.86)	0.551
Nausea	1 (2.86)	1 (2.86)	1.000
Vomiting	0	3 (8.57)	0.076
Headache	2 (5.71)	2 (5.71)	1.000
Tingling sensation	4 (11.43)	0	0.0398*
Soreness at injection site	1 (2.86)	0	0.313

[Table/Fig-7]: Comparison of postoperative adverse effects between group G and group C.
p<0.05 was considered statistically significant; n: Number of patients.

primarily attributed to the analgesic intervention rather than patient-related factors.

In the present study, patients receiving GANB demonstrated significantly better haemodynamic stability during extubation and throughout the postoperative period, particularly with respect to SBP, DBP, and MAP. These findings are consistent with those reported by Liu J et al., who observed attenuation of haemodynamic responses following ultrasound-guided GANB during middle ear surgery [15]. Similar observations were also reported by Chaudhari T et al., and Ayudha R et al., [13,18]. The improved haemodynamic stability observed in our study may be attributed to effective blockade of nociceptive afferent impulses from the surgical site, resulting in reduced sympathetic stimulation and stress response. Minor differences in the magnitude of haemodynamic changes between studies may be explained by variations in surgical procedures, intraoperative analgesic regimens, and timing of postoperative assessments.

Postoperative pain scores were significantly lower in the GANB group at all assessment intervals. These findings correlate well with those of Gautam D et al., who demonstrated significantly lower VAS scores and prolonged postoperative analgesia following GANB in tympanomastoid surgery [10]. Similar reductions in postoperative pain were also reported by Mishra V et al., Ayudha R et al., and Li TT et al., [16-18]. The similarity in findings across studies may be explained by the anatomical distribution of the greater auricular nerve, which supplies the postauricular and mastoid regions commonly involved in tympanomastoid surgery. The effective interruption of pain transmission through selective nerve blockade likely contributed to the consistently lower pain scores observed. Variations in the absolute VAS values among studies may be related to differences in local anaesthetic concentration, volume administered, comparator groups, and duration of postoperative follow-up.

The requirement for rescue analgesia was significantly lower in the GANB group. In the present study, total rescue analgesic consumption was reduced by approximately 45.6% compared with the diclofenac group. This finding is in agreement with Gautam D et al., Chaudhari T et al., Mishra V et al., and Li TT et al., all of whom reported reduced postoperative analgesic consumption and prolonged analgesic duration following GANB [10,13,16,18]. The reduced need for rescue analgesia in our study can be attributed to sustained sensory blockade of the surgical field and superior pain control during the early postoperative period. Differences in the extent of reduction reported among studies may be due to variations in rescue analgesic protocols, postoperative assessment periods, and comparator interventions.

The incidence of adverse effects was low in both groups. Although nausea and vomiting occurred more frequently in the diclofenac group, no major complications related to GANB were observed. These findings are comparable to those reported by Ellison MB et al., Mishra V et al., and Li TT et al., who also demonstrated a favourable safety profile for GANB [11,16,18]. The low incidence of complications may be attributed to the use of ultrasound guidance, which allows accurate identification of neural structures and real-time visualisation of local anaesthetic spread, thereby reducing the risk of inadvertent injury and improving procedural safety.

Overall, the findings of the present study are consistent with existing literature and further strengthen the evidence supporting ultrasound-guided GANB as an effective component of multimodal analgesia for tympanomastoid surgery. Compared with intravenous diclofenac, GANB provided superior postoperative analgesia, reduced rescue analgesic requirements, and improved haemodynamic stability while maintaining a favourable safety profile.

Limitation(s)

The postoperative follow-up period in the present study was limited to 12 hours, which constrained the evaluation of long-term analgesic efficacy, duration of block, and late postoperative complications. As a single-centre study including only patients with ASA physical status I-II, the findings may have limited generalisability to higher-risk populations and other clinical settings. Additionally, postoperative pain assessment using the VAS, although validated, remains subjective and may be influenced by individual pain perception, psychological factors, and communication ability.

CONCLUSION(S)

The GANB provided superior postoperative analgesia compared with intravenous diclofenac in patients undergoing tympanomastoid surgery under general anaesthesia. Patients receiving GANB reported significantly lower postoperative pain scores at all assessment intervals and required fewer rescue analgesic interventions. The total postoperative analgesic consumption was also significantly reduced in the GANB group, indicating more prolonged and effective analgesia. In addition, GANB was associated with better haemodynamic stability during extubation and throughout the postoperative period, reflecting attenuation of the surgical stress response. The incidence of adverse effects was low, and no major block-related complications were observed. These findings support the use of ultrasound-guided GANB as a safe and effective component of multimodal analgesia for tympanomastoid surgery.

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