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Original Research Paper

Anaesthesiology

A COMPARATIVE STUDY TO EVALUATE THE EFFICACY OF COMBINATION BUPIVACAINE WITH ADRENALINE AND LIGNOCAINE WITH ADRENALINE AS INFILTRATION ANAESTHESIA WITH USE OF ADJUNCT CLONIDINE IN MIDDLE EAR SURGERY.

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ABSTRACT **Background:** Most of the middle ear surgeries are performed under local infiltration anaesthesia, with monitored anaesthesia care with use of sedation The aim of the present study is to established A effectiveness of combination bupivacaine with adrenalin with use of adjunct clonidine over lignocaine. **Methods And Materials:** Patients who underwent middle ear surgeries and fulfil inclusion criteria were included, and were randomly allocated in to two groups namely group B (Bupivacaine with adrenalin+ Clonidine), group L (Lignocaine with adrenalin + Clonidine). **Results:** Group (B) showed significantly longer duration analgesia and anaesthesia and low VAS score and high patient satisfaction as compare to group L (p value <0.05). **Conclusion:** We concluded that the combination of bupivacaine and adrenalin with clonidine is a better option for middle ear surgery.

KEYWORDS : Bupivacaine, Lignocaine, Sedation, Analgesia, Anaesthesia.

INTRODUCTION

Most of the middle ear surgery (MES) like myringoplasty, tympanoplasty, stapedectomy, cortical mastoid are traditionally performed under general anaesthesia (GA) and in point of view surgeon feels comfortable with GA technique as compare to Local anaesthesia (LA). Many problems face in LA technique by the patient, like pain on injection of infiltrating drugs, noise, and by the operating surgeon like movement of head-neck position had been reported with the increased risk of patient injuries but other things he required during surgery are blood less surgical field and better post-operative analgesia, it is better achieved with use of local anaesthesia (LA). So that Proper selection of anaesthetic technique is important. Various local anaesthetic available and they act by hindering the generation and conduction of nerve impulses and by blocking the entry of sodium ions into their channels, thereby decreasing the sodium permeability to the nerve membrane, resulting in conduction blockade[1].Among local anaesthetics, 2 % Lidocaine Hydrochloride with 1:200,000 concentration of adrenaline is the most commonly used and is effective from 2 to 3 min following administration and lasts for 45 min to 1.5 h[2].

Lidocaine has a limited duration of action, which is sometimes desired in an LA but for many procedures is less than ideal. Bupivacaine has a much longer duration of action; however, due to its slow onset, it is not an ideal sole agent for procedural analgesia in most situations[3,4] The slow onset also results in a more painful injection when used as a sole agent because one cannot practically 'freeze ahead of the needle'; the recipient, therefore, feels the needle tip traversing throughout the tissues being infiltrated, a painful experience[5,6].In order to prevent patient discomfort and postoperative pain, a long acting local anaesthetic, bupivacaine, which is four times as potent as lidocaine, and has three times the duration of anaesthesia of lignocaine is used [7].Bupivacaine has a higher percentage of the ionised form of molecule, vasodilating property, and increased lipid solubility [8] . LA must be in a non-ionised form to diffuse through the cell membrane, difference in availability of non-ionised form will slow the onset of action of bupivacaine [8]. A buffering local anaesthetic solution will increase the non-cationic form of the drug, which increases the penetration of solution into soft tissue nerve sheath, thereby decreasing the pain during injection [9]. And producing rapid onset of action of LA solution [9,10].

Efficacy of local anaesthetic solution depends upon the stability of vasoconstrictor. Adrenaline degrades by oxidation and it gets deteriorated within several hours [12]. The vasodilating activity of bupivacaine increases blood flow to the tissue at the site of injection enhancing the rapid diffusion of the LA molecule away from the site of injection resulting in a short duration of action and increased blood concentration of anaesthetic agent with overdose reaction and intraoperative bleeding [13]. Addition of a vasoconstrictor, such as adrenaline, decreases the diffusion of local anaesthetic molecule and promotes haemostasis [14] Aim of this study is to established a better anaesthetic technique in middle ear surgery and provided comparatively better comfort to patients, surgeon, and anaesthetist. This study is performed in tertiary care hospital to established a comparative better infiltrating anaesthesia without need of I.V sedation and I.V analgesic. We compare Bupivacaine and adrenaline with lignocaine and adrenalin with use of adjuvant clonidine.

METHOD AND MATERIALS

Total 100 Patients who were scheduled for elective ear surgeries under LA like tympanoplasty, myringoplasty, stapedectomies and cortical mastoid were included in this randomised double-blind clinical trial study, conducted in Pacific Institute of Medical Sciences and attached hospitals at the ENT surgical department from period (June 2017 to June 2018) of one Year after institutional Ethics Committee approval, informed written consent was taken from each patient included.

Inclusion Criteria

1.Patient age group 18- 80 Year, healthy person (ASA grade I

or II) who were scheduled for elective middle ear surgeries under infiltrating local anaesthesia like tympanoplasty, myringoplasty, stapedectomies and cortical mastoidectomy with post auricular approach were included in this study.

Exclusion Criteria

1.Patients of age < 18 and > 80 year with uncontrolled HTN, DM, IHD, pregnancy, lactation
2.Patients who refused surgery under local anaesthesia.
3.History of alcohol or drug abuse.
4.Hypersensitivity reaction to study medications.
5.Infection at area of drugs infiltration
6.Bleeding disorders, on anticoagulant therapy, and on antiplatelet drugs.
7.Patients who require general anaesthesia (no effect of infiltrating drugs)

Using a computer-generated program, 100 patients were randomly divided into two groups of 50 patients each to receive either Bupivacaine with adrenalin and clonidine (group B) or Lignocaine with adrenalin and clonidine (group L). Infiltrating drug (ID) was prepared by observed anaesthetist and to follow the double-blind nature of the study, anaesthetist and surgeon who attended the surgery and recorded the data was unaware about the ID.

Group B- Bupivacaine with adrenalin (0.5%, adrenalin 1:2,00000) 10ml+ clonidine1ug/kg

Group L-Lignocaine with adrenalin (2%, adrenalin 1:2,00000) 10ml+ clonidine 1ug/kg

Preparation Of Study Drugs

The study drugs solution was prepared by observing anaesthetist, freshly before the surgery. If the time between preparation and injection is more than 5 min, the solution was discarded.

Group B-

Under sterile condition 0.1 ml of 1:1000 dilution of adrenaline was drawn into 1 ml of insulin syringe and was added to 20 ml multidose vial of 0.5 % bupivacaine to yield 1:20,0000 adrenaline in 0.5 % bupivacaine. 10 ml of above solution was drawn and add 1ug /kg of clonidine to above solution.

Group L-

10 ml of lignocaine 2% with adrenalin 1:20,0000 was drawn and 1ug /kg of clonidine. The procedure was explained to each patient and informed consent were obtained from each patient prior to starting the procedure. Local anaesthetic allergic testing was carried out by depositing 0.2 ml of freshly prepared solution in the forearm intradermally using 2 ml disposable syringe. After administering the test dose, patient was monitored for 30 min for the signs and symptoms of allergic reaction. One of the two local anaesthetic solutions was administered to patient. Local infiltration was performed by 26 G (1.5inches) hypodermic needle and block was performed by operating surgeon in post auricular region and four quadrants of external auditory canal.

Effect of block (onset action of study drug) was checked by loss of sensation to pinprick in retro auricular area (RA). After that, level of sedation was assessed using Ramsay Sedation Score (RSS). The desired sedation level was defined as RSS >3. If RSS was less than 3, rescue sedation with midazolam 0.2 mg/kg IV was given. Then surgeon proceeded to perform the surgery under local anaesthesia. Intraoperative visual analogue scale (VAS) was measured. Whenever patient complained of pain during the surgery, the surgeon ask to an additional dose of iv anaesthetic. Heart rate (HR), mean arterial pressure (MAP), respiratory rate (RR), and peripheral oxygen saturation (SpO2) were recorded every 10 min till 60 min. Intraoperative bleeding was assessed by bleeding scale (0–4), acceptable bleeding score being 0–2, if bleeding score >2 propofol was given. All adverse events like bradycardia (HR < 55 beats/min), hypotension (MAP < 50 mmHg sustained for >10 min), respiratory depression (respiratory rate < 10 bpm), oxygen desaturation (SpO2 < 90%), nausea or vomiting were recorded. After completion of the surgery patients were transferred to the recovery room where the following were done: Assessment of postoperative pain using Visual Analogue Scale (0–10 cm); if VAS was >3, analgesia was provided with intravenous tramadol 0.5–1 mg/kg. Sedation score was checked by use of Ramsay sedation score before incision and degree of bleeding ask to surgeon and noted by use of boezaart's grading system. Visual analogue Scale used to rate patients pain score. Following data was collected in patient perform sheet.

1. Time Of Onset Of Anaesthesia-

The time of onset of anaesthesia is defined as the first sensation of numbness or tingling in the anesthetised region and is assessed using two-point discrimination method. The patient's ability to discriminate between two points was measured with a sliding calliper. The two pointed, tips of the calliper touched the skin simultaneously with light pressure while the patient's eyes were closed.

2. Duration Of Procedure-

After administration of local anaesthetic solution (in minutes), the time period between first incision until placement of the last suture.

3. Duration Of Analgesia-

Time of onset of block to first request of analgesia. VAS [15] is used for recording of pain. Immediately after deposition of the local anaesthetic solution, the patient was asked to indicate the level of pain on a 10-point VAS (no pain, 0; light pain, 1–3, i.e. pain reported only in response to questioning and without any behavioural signs; moderate pain, 4–6, i.e. pain reported in response to questioning and accompanied by signs, or pain reported spontaneously without questioning; strong pain or unbearable pain, 7–10, i.e. strong vocal response or response accompanied by withdrawal of arms or tears).

4. Degree Of Bleeding -

Ask to operating surgeon (boezaart's grading scale) [16]
1.Cadaver condition, minimum suction require
2.Minimum bleeding with infrequent suction require
3.Brisk bleeding with frequent suction require
4.Bleeding covers surgical field after removal of suction before surgical instrument can performed manoeuvre
5.Uncontrolled bleeding

5. Ramsay Sedation Score.[17]

1.Awake, conscious, no sedation
2.Calm, Compose
3.Awake on verbal command
4.Brisk response to gentle tactile stimuli
5.Awak on vigorous shaking
6.Unarousal

6. Hemodynamic Parameters-

recorded at baseline, then every 20 min till completion of surgery.

7.Side Effects-

Hypotension, bradycardia, respiratory depression, PONV were recorded in each group.

In this study if patient is fully feeling comfortable during perioperative period, we don't use any intravenous sedation and analgesic medication and if patient feel pain during surgery, use injection diclofenac 75 mg given. Study period terminated when patient require first dose of systemic analgesia.

0 (No pain)	2	4	6	8	10 (Worst pain)

Visual Analogue Scale VAS (0–10cm)

Assessment of intraoperative and postoperative pain using Visual Analogue Scale (0–10 cm); if VAS was >3, analgesia was provided with intravenous diclofenac 75 mg or tramadol 0.5–1 mg/kg.

Assessment of patient's satisfaction was done by using 5point Likert scale. A type of psychometric response scale in which responders specify their level of agreement to a statement typically in five points: (1) Strongly disagree; (2) Disagree; (3) Neither agree nor disagree; (4) Agree; (5) Strongly agree. asking the patient to answer the question, "How would you rate your experience during surgery?" using a 5-point Likert verbal rating scale. This assessment of patient's satisfaction was performed just before shifting to ward to minimize the effects of sedation on patient's judgment.

RESULT

The demographic data of the two study groups are summarized. [Figure 1] showing gender distribution in both the group. In group B 60%were male and 40%were female and in group L 56%were male and 44% were female. Statistical analysis revealed non-significant differences between the two study groups as regards gender distribution (P value 0.1612).

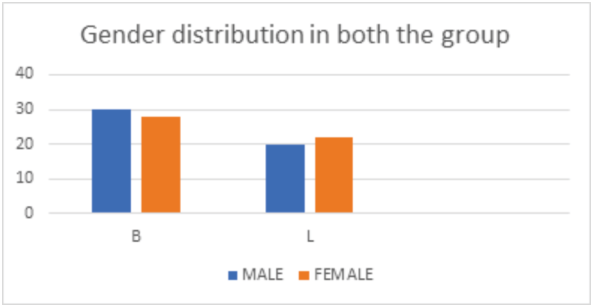


Figure 1 Showing Distribution Of Gender In Both The Group

Table [1,2] showing distribution age and weight respectively in both the groups but the statistical analysis revealed non-significant differences between the two study groups as regards age and weight distribution [p value >0.05].

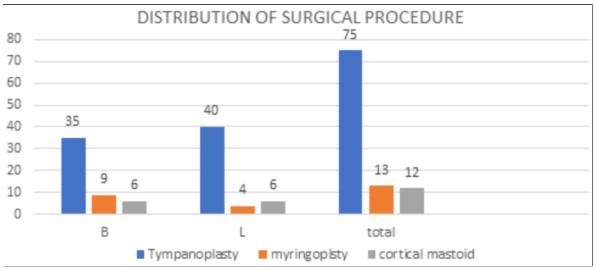
[Table 1] Showing Age Distribution In Both The Groups

Age (year)	Group B	Group L	P value
Mean ±SD	39.6±15.1	38.8±15.64	0.41

[Table 2] Showing Distribution Of Weight In Both The Group

Weight (kg)	Group B	Group L	P value
Mean ±SD	79.65±15.1	75.47±17.65	0.210

The distribution of surgical procedures between the two study groups was found to be non-significantly (p > 0.05) different between the study groups [Figure2]



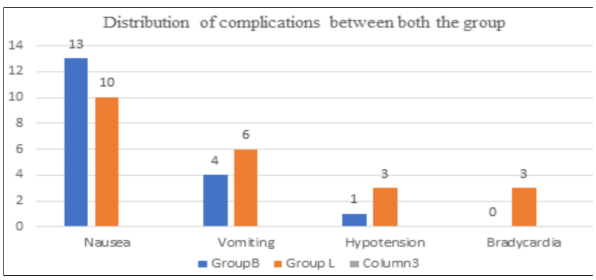
[Figure 2] Showing Distribution Of Type Of Surgery (SX) In Both Group

Maximum SX performed in group B and group L are tympanoplasty (75) followed by myringoplasty (13) and cortical mastoid (12). The distribution of these procedures between the two study groups was found to be non-significantly (p > 0.05) different between the study groups [Figure 2]

[Table 3] Showing Intraoperative Variables

Variables	(M±SD) group B	(M±SD) group L	P value
Degree of bleeding	1.95 ± 0.62	2.20 ± 0.46	<0.05
VAS score	1.11 ± 1.22	1.50 ± 1.20	<.0.001
Ramsay S S	2.26 ± 0.82	2.04 ± 0.82	>0.05
Onset time analgesia (in minute)	4.13 ± 1.92	3.47 ± 1.70	<0.001
Duration of analgesia	532.16±108.54	301.86 ± 106.58	<0.001
Duration of SX	45.98 ± 15.05	47.87 ± 16.91	0.43

Intraoperative bleeding measured by bleeding scale (boezaart's grading scale) was statistically significant less in group (B) than in group (L) [p value <0.05] [Table 3]. Intra-operative pain was not felt by the patients in both the group in tympanoplasty and myringotomy SX but during cortical mastoid patients demand rescue analgesia and measured by using visual analogue scale (VAS). It showed that there was statistically significant difference between the two groups as regards the use of rescue analgesic drug if VAS > 3 needed diclofenac 75mg intravenous (p < 0.001). Intraoperative sedation was measured by using Ramsay sedation score. It revealed that there was no statistically significant difference between the two studied groups, where the (B) group (2.26±0.82) showed equal sedation as L group (2.04 ± 0.82). No need of rescue sedation in both the group even in cortical mastoid SX [Table 3] Onset time of analgesia is more in B group compare to L group and duration of analgesia is longer in B compare to L group, this is statistically significant (p value is <0.001) but the duration of SX was nearly same in both the group and not statistically significant (p value 0.43) [table 3]



[Figure 3] Showing Intraoperative Complications In Both The Group

Out of 50 patients ,13(26%) patients complain of nausea in group B and 10(20%) in group L, complains of vomiting was higher in group L (12%) of patients as compare to B (8%). For that injection ondansetron 4 mg IV was used. Hypotension (MAP <50) was noted in 3(6%) patients in group L compare to group B in 1 (2%) patient, that was corrected by using me-phentermine 6 mg single shot. Brady cardia (PR<50) was found in 3 (6%) patients of group L, atropine 0.6 mg was used for correction [Figure 3]. Post operative analgesia was better in Group B as compare to group L that was measured with VAS score and only (20%) of patients demand rescue analgesia however in group L (70%) of patients demand rescue analgesia and it was statistically significantly (p value <0.05). Patient's satisfaction was significantly higher in group (B) (90%) compared with group (L) (40%) (p < 0.05) [Table 4]

[Table 4] Showing Post-operative Variable

Post op variables	Group B	Group L	P value
VAS score (>3)	10(20%)	35(70%)	0.001
Rescue analgesia	10(20%)	35(70%)	0.001
Patient satisfaction (4, 5 Likert scale)	45(90%)	20(40%)	0.001

MAP	(M±SD) Group B	(M±SD) Group L	P value
T0-Base line	85.56±5.44	87.56±6.18	>0.05
T1-20 min after SX	73.56±3.5	85.346±5.89	<0.05
T2 40 min after SX	70.16±5.89	78.54±4.54	>0.05
T3-60 min after SX	70.05±4.99	75.54±3.65	>0.05
PR			
T0-Base line	91.51±5.60	87.56±6.18	>0.05
T1-20 min after SX	65.15±3.54	85.346±5.89	<0.05
T2- 40 min after SX	60.25±5.46	78.54±4.54	<0.05
T3-60 min after SX	61.125±3.45	75.54±3.65	<0.05
SPO2			
T0-Base line	97.65±1.54	97.445±0.78	>0.05
T1-20 min after SX	98.654±0.89	97.105±1.057	>0.05
T2- 40 min after SX	97.65±1.246	98.254±1.18	>0.05
T3-60 min after SX	97.857±1.88	98.077±0.879	>0.05
RR			
T0-Base line	17.65±1.335	18.46±1.09	>0.05
T1-20 min after SX	17.998±1.6	18.089±1.216	>0.05
T2- 40 min after SX	17.54±1.115	18.13±1.86	>0.05
T3-60 min after SX	17.89±1.88	18.56±1.564	>0.05

[Table 5 showing distribution of Intraoperative hemodynamic in both Group Heart rate and mean blood pressure were statistically significant lower in group (B) than in Intraoperative hemodynamic (HR, MAP, RR, SpO2) were measured every 20 min for 60 min. Heart rate and mean blood pressure were statistically significant lower in group (B) than in group (L) after 20 min from the start to the end of the procedure (p > 0.05). Respiratory rate and, SpO2 were statistically insignificant throughout all the procedure [Table 5].

DISCUSSION

Middle ear is an air-filled space that is traversed by facial nerve that provides motor innervation to facial expression muscles [18,19] .All age group patients can be affected by disease of middle ear and need surgical intervention to cure include tympanoplasty (reconstructive surgery for the tympanic membrane, or eardrum), stapedectomy or ossiculoplasty for otosclerosis, mastoidectomy for removal of infected air cells within the mastoid bone, and removal of cholesteoma, myringotomy, grommet insertion. and cochlear implantation[19] .Although most of the surgeries performed under general anaesthesia and due to this unique location ,size delicate content of the middle ear, great care must be taken during the perioperative period and special considerations include: provision of a bloodless surgical field, attention to patient's head positioning, airway management, facial nerve monitoring, the effect of nitrous oxide on the middle ear, a smooth and calm recovery, and prevention of postoperative nausea and vomiting (PONV)[19,20,21,22].

A bloodless surgical field is ideal, as even small amounts of blood will obscure the surgeon's view in microsurgery. Attention to patient's head positioning is important to avoid venous obstruction and congestion. In addition, extreme hyperextension or torsion can cause injury to the brachial plexus and the cervical spine[21]. So we need combination of physical and pharmacologic techniques is used to minimize bleeding in surgical field and decrease the complications related to GA. One of the most valuable developments in health care delivery is the shift from inpatient to outpatient surgery and the associated day-case anaesthesia. The main benefit for this change is the economic savings afforded by not admitting patients the night before surgery or keeping them in hospital the night after surgery. Other advantages of outpatient surgery include earlier ambulation, better patient convenience, and a lower risk of nosocomial infection [23]. Essential characteristics for agents of day-case anaesthesia are early discharge and cost effectiveness [24] .One of the methods of outpatient anaesthesia is Monitored Anaesthesia Care (MAC) which is a technique of combining local anaesthesia with parenteral drugs for sedation and analgesia. Uncomplicated middle ear surgery can be performed under local anaesthesia. Four nerves provide innervation to the ear. The auriculotemporal nerve supplies the outer auditory meatus; the great auricular nerve supplies the medial and lower aspect of the auricle and part of the external auditory meatus. The auricular branch of the vague nerve supplies the concha and the external auditory meatus, and the tympanic nerves supply the tympanic cavity [18,21]. So the aim of our study to select local anaesthetic agents with adjuvants so the surgery can be performed with-out getting trouble to patients, surgeon and anaesthetists. Using single agent for MAC usually does not provide full control of the patient's status and almost always requires intraoperative intervention with rescue medications. So, combining two agents from the start allows the use of lower dose of each and hence decreasing its own undesired effects and gains the augmented desirable effects of each. We compared the efficiency and safety of bupivacaine plus adrenalin /clonidine versus Lignocaine plus adrenalin/clonidine as during surgical ear procedures conducted under local anaesthesia. We found that both the group same in distribution of demographic data like age gender, weight, type of surgery, there is no statistically significant. (p value> 0.05)

We also found that mean Ramsay Sedation Score (RSS) was same in both the group, no statically significant difference was found in both the group in view of RSS (P value >0.05). Sedation effect of clonidine was because of has a high ratio of specificity for the alpha2 versus the alpha1 receptor (200: 1). Through presynaptic activation of the alpha2 adrenoceptors, it inhibits the release of norepinephrine and subsequently decreases sympathetic tone. It also attenuates the neuroendocrine and hemodynamic responses to anaesthesia and surgery, leading to sedation and analgesia [25] .The highest density of alpha2 receptors has been detected in the locus ceruleus, the predominant noradrenergic nucleus in the brain and an important modulator of vigilance. The sedative effects of alpha2 adrenoceptor activation have been attributed to this site in the CNS, and this allows psychomotor function to be preserved while making the patient rest comfortably, so patients are able to return to their baseline level of consciousness when stimulated which is beneficial for MAC [26]. Based on this pharmacologic background, our results may be explained on the fact that clonidine is a effective sedative and analgesic agent with better preservation of psychomotor function in the give doses by its sympathetic attenuating effect.

Intraoperative bleeding was significantly less in group (B) as compared to group (L) this is because controlled intraoperative hypotension effectively decreases surgical blood loss and improves surgical field exposure which is essential for otology surgeries. Combination bupivacaine and Clonidine facilitates controlled hypotension by decreasing the heart rate, systolic, diastolic and mean blood pressure more effectively as compare to lignocaine and clonidine combination. Study conducted by M kanemik favour our result in hemodynamic response. According to that study patients developing a sensory block at or above T6 there was a greater drop in mean arterial pressure and cardiac output and a faster decrease in heart rate for bupivacaine compared to patients receiving Lignocaine. [27]

We observed that intraoperative and postoperative rescue analgesic requirement was significantly less in group (B) than in group (L) that was measured with help of VAS score. Intraoperative and Postoperative VAS score was significantly less in group (B) than in group (L) and the onset time of analgesia and duration of analgesia was longer in group B as compare to group L. The most commonly used local anaesthetic agents are Lidocaine and Bupivacaine.

Lidocaine acts faster (within 2-5 minutes of injection) and for this reason is often favoured in outpatient setting for pre-incisional injection. However, its effects only last up to 2 hours, without epinephrine, and 3 hours, with epinephrine. On the other hand, Bupivacaine, has a slower onset of action (about 5-10 minutes after injection) but its effects last much longer, for about 4-8 hours. The delay in onset of action makes it a less popular option as a primary source of local anaesthesia in outpatient hand surgery. It has been found that both bupivacaine and lignocaine have their merits and demerits but beyond any doubt it has been proven by the clinical trials that bupivacaine provides better and prolonged analgesia and anaesthesia post operatively. Hence, bupivacaine can be regularly used as the anaesthetic solution along with adrenaline 1:200,000 for surgical procedure[28] .Safety is a main concern for any MAC technique. However, a poorly controlled technique may result in deep sedation or general anaesthesia with all its attendant risks. There-fore using more than one agent may allow the anaesthetist to use fewer doses decreasing the harmful effects of each and allows augmenting the beneficial effects of each drug used. Study conducted by WN Maimon revealed that the ideal local anaesthetic agent for facial plastic surgery should have rapid onset, good surgical anaesthesia, and reasonably long duration. They compared 1% lidocaine hydrochloride with 1:200,000 epinephrine with 0.5% bupivacaine hydrochloride with 1:200,000 epinephrine, a newer, longer-acting local anaesthetic, in different facial operations and found that bupivacaine is an effective and safe agent for these procedures [29].

In a study on local anaesthesia in middle ear surgery by Caner and colleagues [30] patients were premedicated and sedation was used along with local infiltration with 2% lidocaine with 1:10,000 epinephrine and auriculotemporal/ auricular nerve blocks was achieved. In a similar survey, Yung [31] found the most common discomforts reported were noise during surgery and anxiety, followed by dizziness, backache, claustrophobia, and earache. Despite these discomforts, however, 89% of patients said they would prefer local anaesthesia for similar operations in the future. Pain was felt mainly at the beginning of surgery when multiple injections of local anaesthetic were given, and perhaps the preoperative application of lidocaine and prilocaine (EMLA) could have assisted in this. For the surgeons, the main advantage of performing middle ear surgery under local anaesthesia is the ability to test hearing during surgery, and they also report less bleeding. The main concerns of not performing middle ear surgery under local anaesthesia are that patients may not tolerate the discomfort and the possibility of sudden movement. Another drawback is potential toxicity, as near toxic plasma levels of local anaesthetic have been reported in the first 5 minutes following infiltration for tympanoplasty [32] but it can be decrease by adding adjuvant in local anaesthetics like clonidine and adrenalin. The head may be obscured by drapes during surgery, and extra vigilance is required for possible respiratory depression or airway obstruction. Supplementary oxygen can be provided with nasal cannula, Thus, with careful patient selection, adequate preoperative explanation, and appropriate use of sedation, middle ear surgery can be successfully performed under local anaesthesia, with high patient and operator satisfaction and acceptance. Alpha-2 agonists such as clonidine or, more recently, dexmedetomidine, may have some advantages, as they produce arousable sedation, analgesia, and a modest reduction in heart rate and blood pressure without respiratory depression, particularly important when the head is obscured by surgical drapes [33]. Surgeons reported satisfactory operating conditions, and patients had no recall of the procedure and no pain[12] .It also has a role in awake craniotomy [34].Thus, dexmedetomidine could be used in a similar way for middle ear surgery but has not been widely reported in the literature. In summary, the advantages of performing middle ear surgery under local anaesthesia and conscious sedation include less bleeding, reduced pain in the immediate postoperative period, early mobilization, cost-effectiveness, and the ability to test hearing restoration during surgery [30].

Limitations of our study were as follows: firstly, inclusion of a broad variety of Ear surgeries for the study.

CONCLUSION

In conclusion, with careful patient selection, local anaesthesia with adding of alpha 2 agonist as adjuvant provide better analgesic and anaesthetic condition and good surgical field with better surgeon and patients satisfaction in middle ear surgery with less complication compare to general anaesthesia.

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