



## Comparison of Local Anaesthesia with Sedation to General Anaesthesia in Surgeries of Middle Ear

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### Abstract

**Introduction:** Middle ear surgeries (MES) can be performed under either general anaesthesia or local anaesthesia and sedation and can be well tolerated by the patient with minimal discomfort.

**Material & Methods:** Eighty patients of either sex, aged between 20 and 50 years of ASA Grades I and II, undergoing MESs (tympanoplasty and mastoidectomy) under local anaesthesia were included. Patients in Local Anaesthesia group received a bolus dose of injection dexmedetomidine 1 µg/kg IV over 10 min followed by an infusion started at 0.4 µg/kg/h IV. In patients of General Anaesthesia group inj propofol 1 mg/kg was given followed by .1mg/kg of vecuronium bromide After 2 minutes pts were put on LMA and maintained with oxygen and nitrous oxide in ratio of 1:2 and 0.5 mac of isoflurane throughout the procedure and were switched off on the commencement of skin stitch.

**Statistics** Hemodynamic data was evaluated using t test for group comparisons. Data not normally distributed was compared using Mann Whitney U test. Categorical data was analyzed using Chi square test. P value less than 0.05 was considered as significant

**Result:** If patients satisfaction is taken for consideration then general anaesthesia technique is preferred over local anaesthesia However the middle ear surgery can be performed with any of the methods of anaesthesia.

### Introduction

Middle ear surgeries (MES) can be performed under either general anaesthesia or local anaesthesia and sedation and can be well tolerated by the patient with minimal discomfort. Advantages with the local anaesthesia techniques are less bleeding, early recovery, post-operative analgesia, inexpensive and most important one is

the ability to test the hearing of the patient intra operatively Commonly used medications for sedation during surgery under local anaesthesia with MAC including opioids, benzodiazepines, propofol and α2 agonists<sup>1,2</sup>. Practicing combination of two agents can provide better patient control and allows the use of smaller doses of each single agent avoiding its undesirable

effects. Despite these advantages, most of MES are still done under general anesthesia due to special concerns; some are related to patients' anxiety which is augmented in some by their hearing loss, limiting their ability to cooperate. Other concerns are related to surgeon comfortability with the hypotensive general anesthetic techniques, and the fear of sudden patient movement during Operation<sup>2,3</sup>

### Material & Methods

After Institutional Ethics Committee approval, written informed consent was taken from all patients who were included in the study. Eighty patients of either sex, aged between 20 and 50 years of ASA Grades I and II, undergoing MESs (tympanoplasty and mastoidectomy) under local anaesthesia were included. Patients with known sensitivity to local anaesthetics, allergy to study drugs, heart disease, renal and hepatic insufficiency, diabetes and hypertension, weighing < 45kg, obesity (body mass index >30 kg/m<sup>2</sup>), pregnant and lactating females were excluded from the study.

Patients were divided randomly into two group, Group A (local anaesthetic) and group B (general anaesthesia with LMA). Patients were placed supine on the operating table with the head turned opposite to the ear to be operated. Routine non-invasive monitoring was applied to all patients with heart rate (HR), peripheral oxygen saturation (SpO<sub>2</sub>), electrocardiogram and non-invasive blood pressure. Intravenous (IV) cannula 20-gauge was secured. Intra operatively all patients received 2 L/min oxygen through nasal catheters. All the patients in both groups were premedicated with IV injection glycopyrrolate.2 mg, Pentazocin .5mg/kg midazolam 1mg & diclofenac sodium 75 mg I/M. Patients in Group A received a bolus dose of injection dexmedetomidine 1 µg/kg IV over 10 min followed by an infusion started at 0.4 µg/kg/h IV. The level of sedation was assessed using Ramsay Sedation Score (RSS).<sup>[10]</sup> where the desired sedation level was defined as RSS ≥4

achieved. Local anesthetic infiltration was performed by the operating surgeon who used lignocaine 2% with adrenaline 1:200,000 for blocking the tympanic branch of auriculo temporal nerve and great auricular nerve

In patients of Group B inj propofol 1 mg/ kg was given followed by .1mg/ kg of vecuronium bromide After 2 minutes pts were put on LMA and maintained with oxygen and nitrous oxide in ratio of 1:2 and 0.5 mac of isoflurane throughout the procedure and were switched off on the commencement of skin stitch. Simultaneously, the operating area was prepared and draped. IV paracetamol infusion 1 g was given as intra operative rescue analgesic and the surgeon used an additional dose of local anaesthetic. If RSS was <4, rescue sedation with a bolus of midazolam 0.01 mg/kg was given.

Haemodynamic parameters were recorded every 10 minutes and any untoward events were noted. **RAMSAY Sedation Score<sup>6</sup>** (1 = anxious, agitated, restless; 2 = cooperative, oriented, tranquil; 3 = responds to commands only; 4 = brisk response to light glabellar tap or loud noise; 5 = sluggish response to light glabellar tap or loud noise; 6 = no response) was used for the sedation score.

### Statistical Analysis

Hemodynamic data was evaluated using *t* test for group comparisons. Data not normally distributed was compared using Mann Whitney U test. Categorical data was analyzed using Chi square test. *P* value less than 0.05 was considered as significant

### Observation

**Table-1** Demographic profile

profile	Group I	Group II
Age	35.7	34.3
Sex (M/F)	26/14	24/16
BMI	23.8	24.6
ASA (gr I/II)	36/4	37/3

Both the groups were comparable according to AGE, SEX, BMI & ASA grading

**Table-2** Baseline Vitals

Baseline vitals	Group I	Group II
Heart rate	88.6	86.4
SAP	117.2 (5.17)	115.4 (4.11)
DBP	79.3 (4.27)	78.8 (4.35)
SpO2	99	99

Both the groups were comparable according to Baseline vitals

**Table-3** Type of Surgery

Type of surgery	Group I	Group II
tympanoplasty	25	27
mastoidectomy	15	13

Both the groups were comparable according to type of surgery

**Table-4** Pulse Rate (PR)

time	Group I	Group II
0	88.6(7.6)	86.4 (7.94)
10	92.7(10.51)	93.4 (11.26)
20	92.2 (7.28)	92.7 (10.51)
30	90.3 (9.11)	90.9 (8.69)
40	88.4 (8.35)	89.0 (7.03)
50	87.7 (7.98)	88.0 (6.74)
60	88.4 (7.94)	88.4 (7.94)

The pre-operative PR was comparable in both group and statistical evaluation shows no significant difference in PR (P=0.69) .

**Table-5** Systolic Blood Pressure (SBP)

time	Group I	Group II
0	117.2 (5.17)	115.4 (4.11)
10	121.1 (8.86)	119.7 (4.78)
20	127.1 (8.19)	129.6 (9.35)
30	119.7 (4.78)	121.1 (8.86)
40	118.6 (7.51)	117.9 (4.47)
50	117.1 (7.03)	116.1 (4.23)
60	115.9 (6.76)	115.7 (4.99)

The pre-operative SBP were comparable in both the group and statistical evaluation shows no significant difference in SBP (P=0.44)

**Table-6** Diastolic Blood

time	Group I	Group II
0 Base line	79.3 (4.27)	78.8 (4.35)
10	81.3 (4.22)	80.7 (5.32)
20	82.8 (5.52)	82.0 (6.84)
30	80.7 (5.32)	81.3 (4.22)
40	80.7 (4.56)	80.7 (5.32)
50	79.7 (4.74)	79.2 (5.21)
60	78.4 (4.19)	78.0 (4.26)

Pressure (DBP)

The pre-operative DBP were comparable in both the group and statistical evaluation shows no

significant difference in DBP (P=0.31) .

**Table-9** Patient Satisfaction Score

Grade	GroupI (LA)	Group- II (GA)
Excellent	15	18
Very Good	16	14
Good	5	6
Average	4	2
Bad		

Patient satisfaction was comparable in both the group. (P=0.289)

**Table-10 - Complication**

	Group I	Group II
nausea	4	8
vomitting	1	4
drymouth	4	5
hypotension	4	3
Hypertension	2	5
Bradycardia	3	4
Tachycardia	3	6

The incidence of complication were more in general anesthesia group as compared to local anesthesia group

**Result**

The local anesthetic technique with sedation had a preference over general anesthesia technique with LMA as it was more preferred by the surgeon and the complication was also fewer though was not statistically significant.

If patient’s satisfaction is taken for consideration then general anesthesia technique is preferred over local anesthesia. The middle ear surgery can be performed with any of the methods of anaesthesia.

**Discussion**

The patient, surgeon and anesthesiologist may face different set of challenges in Middle- ear surgeries. Sympathetic stimulation and movements of an anxious patient cause increased bleeding and disturb the fine microscopic nature of the surgery which may even lead to graft failure. The advantages of local anesthesia include possibility of testing of hearing intra operatively, having less bleeding, detecting the complications early and a quicker postsurgical emergence<sup>3,8</sup>. The patient needs to be informed prior to infiltration of

LA that he will be able to feel manipulation of tissues and the noise of instruments, but there will be no pain<sup>[3]</sup>. good patient selection, pre-operative explanation and the use of appropriate sedation are the important factors for local anaesthesia ear procedures to be acceptable to patients. otherwise the intense sensation of noise during the operation (29.6% of patients) and anxiety (24%) were the most common discomforts, followed by dizziness (14.8%), backache (13.9%), claustrophobia (9.3%) and earache (1.9%)<sup>3x</sup> A sedative drug should have a quick recovery, and be easy to administer and monitor

Monitored Anaesthesia Care (MAC) is the terminology used for sedation given along with the local anesthesia for short procedures<sup>9</sup>. Over sedation leading to respiratory depression is an important mechanism of patient injuries during MAC<sup>10,12</sup>. A dose- dependent relationship exists with a sedative induced reduction in ventilator response to hypercarbia. The literature suggests that combining a sedative with an opioid provides effective moderate sedation<sup>11</sup> Pressor response to Laryngoscopy & Endotracheal intubation is associated with increase in sympathetic activity. In our study we used LMA instead of ET tube so the haemodynamic parameter and the post operative complication were comparable.

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