

Comparison of Tympanoplasty under General Anaesthesia and Monitored Anaesthesia Care with Dexmedetomidine

Jagruti Satasia*, Jaydeep Vaniya**, Charu Pandya***

*Assistant Professor, **Professor And Head Of Department, Department Of Anaesthesia, AMCMET Medical College, Ahmedabad 380008, ***Resident Doctor, Anaesthesia Department, N.H.L. Medical College, Ahmedabad.

Abstract: Introduction: Tympanoplasty for the surgical correction of chronic suppurative otitis media is one of the most common ENT surgical procedures. This surgery can be done both under general anaesthesia and local anaesthesia with sedation. Dexmedetomidine is said to have both analgesic and sedative properties. The aim of this study is to compare the results of monitored local anaesthesia with dexmedetomidine with general anaesthesia in patients undergoing tympanoplasty to find out the better efficacious anaesthesia for this surgery. Methods: 100 patients were planned for tympanoplasty were taken up for this study. 50 patients were operated under general anaesthesia and remaining 50 patients were operated under monitored local anaesthesia with dexmedetomidine. The results were evaluated intraoperatively and postoperatively for duration of surgery, hemodynamic stability and complications. Patient's and surgeon's satisfaction was also evaluated. Results: The results showed that there was lesser operating time, lesser complications and more hemodynamic stability in patients operated under monitored anaesthetic care with dexmedetomidine than under general anaesthesia. There was better surgeon and patient satisfaction in dexmedetomidine group and there was no requirement of general anaesthesia afterward. Conclusion: It can be concluded that dexmedetomidine is a safe and effective sedative for tympanoplasty done under monitored local anaesthesia and can be preferred method of choice over general anaesthesia. [Jagruti S NJIRM 2017; 8(4):6-9]

Key Words: Monitored anaesthesia care, Dexmedetomidine, General anaesthesia, Tympanoplasty

Author for Correspondence: Jagruti Satasia, 8-Shrinath Bung, B/H Girivar Bung, Ramvadi Isnapur, Ahmedabad 382443. E-Mail: satasiajr@gmail.com M: 9898261222

Introduction: Tympanoplasty is the surgical procedure performed for reconstruction of tympanic membrane and/or middle ear ossicles. It is most commonly done for the surgical correction of chronic suppurative otitis media. This surgery can be done both under general anaesthesia and local anaesthesia with sedation. Dexmedetomidine is selective alpha₂ adrenergic receptor agonist and is said to have both analgesic and sedative properties.⁷

Aim of Study: The aim of this study is to compare the results of monitored local anaesthesia with dexmedetomidine and general anaesthesia in patients undergoing tympanoplasty to find out the better choice of anaesthesia for this surgery.

To avoid the complications of general anaesthesia.

Methods: After approval from institutional Ethical Committee and written informed consent, 100 adult patients of American Society of Anaesthesiologists (ASA) physical status I and II of both genders, aged 18-60 years, scheduled for elective tympanoplasty surgery, were enrolled for this prospective controlled randomized study. Exclusion criteria were presence of cardiac or respiratory disease, hypertension, hepatic or renal dysfunction, bleeding or coagulation disorders. Patients with a history of anticipated

difficult airway, those on sedatives, hypnotics or antihypertensive medication or allergy to any anaesthetic medications were also excluded from the study 100 patients were randomly divided into 2 groups for this study. Group A (50 patients) were operated under general anaesthesia and Group B (50 patients) were operated under local anaesthesia with dexmedetomidine infusion.

Pre-Operative Assessment & Counseling: A day before surgery patients were visited for pre-op assessment & counseling. All patients were conscious, co-operative, oriented to time, place and person. Patient's pulse, blood pressure, respiratory rate, SpO₂ was noted and were within normal limits. All routine investigations were within normal limits.

On The Day Of Surgery: In every patient, after transferring to the operation theater, 18 gauge intravenous line was inserted and monitors like ECG, NIBP, SPO₂, EtCO₂ were applied.

In Group A General anaesthesia was given. Inj. Glycopyrrolate 4mcg/kg (i.v.), Inj. Ondansetron 80mcg/kg (i.v.), Inj. Midazolam 20mcg/kg (i.v.) and Inj. Fentanyl 2mcg/kg (i.v.) was given as premedication. Induction was done by Inj. Sodium thiopentone 4-5mg/kg (i.v.) and Inj. Succinylcholine

2mg/kg (i.v.). Intubation was done with cuffed endotracheal tube No.8.5/9.0 in male patients and No.7.0/7.5 in female patients. Maintenance was done by O₂ +N₂O (50:50) + Sevoflurane (expired conc. 1.5%) + Inj. Vecuronium 0.08-0.1 mg/kg (i.v.) + Inj. Vecuronium 0.02 mg/kg (i.v.) as required. Reversal is done by Inj. Glycopyrrolate 8mcg/kg (i.v.) and Inj. Neostigmine 0.05mg/kg (i.v.)

In Group B patients were given Inj.Glycopyrrolate 4mcg/kg (i.v.) and Inj.Ondansetron 80mcg/kg (i.v.) as premedication. Inj. Dexmedetomidine 1mcg/kg over 10 minutes (i.v.) as a loading dose. At the same time Inj.Xylocaine 2% 5-8ml was given at post auricular region at incision site and Inj.Xylocaine 2% 4-6 ml was given in ear canal. Then Inj.Dexmedetomidine 0.2mcg/kg/hr (i.v.) by infusion for maintenance. The patients were assessed intraoperative and postoperative for Hemodynamic stability during surgery in both groups, Intraoperative and postoperative complications in both groups. Satisfaction of patients and surgeons in both groups. Details were collected and results were compared. Patient's and surgeon's satisfaction was observed.

Results: We took 100 patients for this study. All the patients were operated for tympanoplasty and all the data was collected. All the patients were in age group of 18-60years. Both groups were demographically comparable.

Age group	male	female	total
18-30	11	14	25
31-45	15	26	41
46-60	15	19	34

The patients were assessed intraoperatively and postoperatively. Patients in Group B were more stable regarding Heart rate & Systolic blood pressure than Group A. There was rise in systolic blood pressure and heart rate after endotracheal intubation and extubation in Group A. Oxygen saturation was very well maintained in both groups in our study. There was no rhythm change in both groups.

Postoperative complications were more in Group A than Group B. The patients of Group A had more complications of sore throat, nausea, vomiting. We had to give general anaesthesia in one patient due to inadequate sedative effect. The satisfaction of patient and surgeon was inquired and recorded.

Intraoperative findings in both groups

No	findings	Group A	Group B
1	Systolic blood pressure(mmhg)	120+12	102+10
2	Diastolic blood pressure(mmhg)	78+14	72+8
3	Heart rate (per min)	82+8	68+5
4	SpO ₂ (%)	99-100	99-100

Patient satisfaction

Results	Group A (total=50)	Group B (total=50)
Extremely unsatisfied	0	0
Unsatisfied	0	0
Undecided	0	1
Satisfied	41	42
Extremely satisfied	9	7

Surgeon satisfaction

Results	Group A (total=50)	Group B (total=50)
Extremely unsatisfied	0	0
Unsatisfied	0	0
Undecided	0	0
Satisfied	43	35
Extremely satisfied	7	15

Discussion: Tympanoplasty can be performed both under local anaesthesia and general anaesthesia. Monitored anaesthetic care (MAC) is a technique of administration of local anaesthesia combined with IV sedation and analgesics. Both technique can be applied to tympanoplasty in which adequate sedation and analgesia without respiratory depression is desirable for comfort of patient and surgeon. The ideal anaesthesia technique should provide adequate analgesia, clear operative field, without any complication after completion of surgery. The comparison of different anaesthesia types have been discussed in various studies in literature. Tympanoplasty can be performed both under local anaesthesia and general anaesthesia. Monitored anaesthetic care (MAC) is a technique of administration of local anaesthesia combined with IV sedation and analgesics. Both technique can be applied to tympanoplasty in which adequate sedation and analgesia without respiratory depression is desirable for comfort of patient and surgeon. The ideal anaesthesia technique should provide adequate analgesia, clear operative field, without any

complication after completion of surgery. The comparison of different anaesthesia types have been discussed in various studies in literature. Recovery from GA results in pain due to elevated catecholamine concentration.⁸ similar results were obtained in our study. Goksu et al reported sufficient analgesic effect when dexmedetomidine was used.⁹ Advantages of general anaesthesia are safe airway and there is no need for patient's co-operation. Disadvantages of general anaesthesia are nausea and vomiting due to side effects of endotracheal intubation or inhalation of anaesthetic drug, requires increased complexity of care, sore throat, headache, shivering, and delayed return to normal mental functioning, increase in systolic blood pressure and heart rate at the time of intubation and extubation. Advantages of local anaesthesia with dexmedetomidine infusion are shorter operative time due to no need for endotracheal intubation, mechanical ventilation, extubation, awakening and shorter recovery time, good analgesia and sedation⁷ without respiratory depression, good hemodynamic stability during whole surgery, clear operative field. Disadvantage of local anaesthesia with dexmedetomidine infusion is that patients may require general anaesthesia. Dexmedetomidine is a selective alpha 2 receptor agonist⁶ with properties of both analgesic and sedative without causing major respiratory depression. It has a shorter half life (2 hours) as compared to other sedatives. The analgesic effect is by suppressing the sympathetic nerve system¹⁰. Dexmedetomidine induces sedation by decreasing activity of neurons in the locus ceruleus in the brain stem, thereby increasing activity of inhibitory gamma-amino butyric acid neurons in the ventrolateral preoptic nucleus. In previous studies which performed sedation with dexmedetomidine, the sedative effect necessary for procedure was maintained while there was no occurrence of respiratory inhibition such as reduced oxygen saturation, increased end-tidal CO₂, or decrease in respiration rate to the end of the procedure.^{4,9,10} It attenuates the stress responses during surgery and maintains intraoperative hemodynamics.² According to a study dexmedetomidine can provide induced hypotension with blood less surgical field.^{3,5} Similarly in our study we found lesser intra operative bleeding in group B using dexmedetomidine for sedation as compared to GA group. Continuous intraoperative administration of dexmedetomidine does not affect intraoperative cardiovascular stability.¹ In our study

hemodynamic status was stable in group B. According to our study, the satisfaction of patients was equal in local anaesthesia using dexmedetomidine as compared to general anaesthesia. The satisfaction of surgeon was better with local anaesthesia with dexmedetomidine, as it produced induced hypotension, which was good for clear surgical field. Dexmedetomidine is increasingly being used as a sedative for monitored care anaesthesia for various surgical procedures. There was no need for opioid analgesic. In our study we also observed good sedative effect with dexmedetomidine in group B as there was hardly any need for general anaesthesia.

Conclusion: Monitored anaesthetic care with dexmedetomidine is a safe and effective anaesthesia technique for sedation and analgesia during tympanoplasty. It causes stable hemodynamic state, clear operative field, less nausea and vomiting, shorter recovery phase and good satisfaction for both patient and surgeon. It is an effective choice also for those who are not systematically healthy and fit for general anaesthesia. So we can conclude that dexmedetomidine is a safe and effective sedative and analgesic for tympanoplasty done under monitored local anaesthesia and can be preferred method of choice over general anaesthesia.

References:

1. V. Jagadish, K. Chaitanya, Viditha; A study on intraoperative and postoperative effects of dexmedetomidine on hemodynamic stress response and anaesthetic requirements; *Perspect Med Res*, Volume 2, 2014, pp. 3-10.
2. C.R.Patel, S.R. Engineer, B.J. Shah, S. Madhu; Effect of intravenous infusion of dexmedetomidine on perioperative hemodynamic changes and postoperative recovery: a study with entropy analysis; *Indian J Anaesth*, Volume 56, Issue 6, 2012, pp. 542-546.
3. H.Ayoglu, O.Yapakaci, M.B. Ugar, et al.; Effectiveness of dexmedetomidine in reducing bleeding during septoplasty and tympanoplasty operations; *J Clin Anaesth*, Volume 20, Issue 6, 2008, pp. 437-441.
4. Dogan R, Erbek S, Gonencer HH, Erbek HS, Isbilen C, Arslan G. Comparison of local anaesthesia with Dexmedetomidine sedation and general anaesthesia during septoplasty. *Eur J Anaesthesiol*. 2010;27:960-4.

5. Durmus M, But AK, Dogan Z et al. Effect of dexmedetomidine on bleeding during tympanoplasty or septorhinoplasty. *Eur J Anaesthesiol* 2007; 24: 985-986.
6. Hatem Saber Mohamed, Salah Mostafa Asida, Ossama Hamdi Salman; Dexmedetomidine versus nimodipine for controlled hypotension during spine surgery; *Egypt J Anaesth*, Volume 29, 2013, pp.325-331.
7. Na HS, Song IA, Park HS, Hwang JW, Do SH, Kim CS. Dexmedetomidine is effective for monitored anesthesia care in outpatients undergoing cataract surgery. *Korean J Anesthesiol* 2011;61:453-9.
8. Candiotti KA, Bergese SD, Bokesch PM, Feldman MA, Wisemandle W, Bekker AY. Monitored anesthesia care with dexmedetomidine: A prospective, randomized, double-blind, multicenter trial. *Anesth Analg*. 2010;110:47–56.
9. Goksu S, Arik H, Demiryurek S, Mumbuc S, Oner U, Demiryurek AT. Effects of dexmedetomidine infusion in patients undergoing functional endoscopic sinus surgery under local anaesthesia. *Eur J Anaesthesiol* 2008; 25: 22-28.
10. Aydil U, Yilmaz M, Akyildiz I, Bayazit Y, Keseroglu K, Ceylan A. Pain and safety in otorhinolaryngologic procedures under local anesthesia. *J Otolaryngol Head Neck Surg* 2008; 37: 851-855.

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