(e) ISSN Online: 2321-9599

(p) ISSN Print: 2348-6805

ORIGINAL ARTICLE

Use of dexmedetomidine infusion as anaesthetic adjuvant during middle ear surgery

Yogesh Kumar

Associate Professor, Department of Anaesthesia, Mayo Institute of Medical Sciences Gadia, Barabanki, UP, India

ABSTRACT:

Background: The use of an operating microscope in a largely bloodless environment is made possible by hypotensive anesthesia, which has completely changed middle ear surgery performed under general anesthesia. The present study evaluated the use of dexmedetomidine infusion as anaesthetic adjuvant during middle ear surgery. **Materials & Methods:** 56 patients undergoing elective middle ear surgery of both genders. Patients were divided into 2 groups of 28 patients each. Group I patients received infusion of dexmedetomidine 0.5 µg/kg/hour and group II patients received placebo infusion of normal saline during middle ear surgery after induction of anaesthesia till 20 minutes before completion of surgery. Parameters such as bleeding at surgical field, haemodynamic changes, awakening time and post-operative recovery. **Results:** The mean surgical time in group I was 97.4 minutes and in group II was 106.2 minutes. The mean heart rate (beats/min) at baseline in group I was 95.1 and in group II was 92.8, after induction was 74.3 in group I and 73.4 in group II, after intubation 5 min was 78.6 in group I and 76.1 in group II, after 30 min was 74.6 in group I and 77.5 in group II, after 60 min was 69.7 in group I and 88.3 in group II and after extubation was 87.5 in group I and 99.3 in group II. Intraoral bleeding score 1 was seen in 22 in group I and 2 in group II and score 2 in 6 in group I and 21 in group II. Score 3 was seen in 5 in group II. The difference was significant (P< 0.05). **Conclusion:** It was safe to use dexmedetomidine infusion to create an oligaemic operative field for improved visibility during middle ear surgery performed under an operating microscope.

Key words: Isoflurane, Middle ear surgery, Dexmedetomidine

Corresponding author: Yogesh Kumar, Associate Professor, Department of Anaesthesia, Mayo Institute of Medical Sciences Gadia, Barabanki, UP, India

This article may be cited as: Kumar Y. Use of dexmedetomidine infusion as anaesthetic adjuvant during middle ear surgery. J Adv Med Dent Scie Res 2017;5(10):135-137.

INTRODUCTION

The use of an operating microscope in a largely bloodless environment is made possible by hypotensive anesthesia, which has completely changed middle ear surgery performed under general anesthesia.[1]The two main techniques used to reduce blood loss during middle ear surgery were topical injection of epinephrine (1: 200,000 or 1: 50,000) and modest head elevation of 15°. There are currently a number of inhalational or intravenous anesthetic procedures that have been studied to provide the best intraoperative conditions possible for middle ear surgery, each with pros and cons.[2,3]

Anesthesia can be used for both local and global tympanoplasty procedures. Due to several benefits, including less bleeding and the ability to test hearing while performing the procedure, some surgeons favor employing local anesthesia for middle ear surgery.There is always a search for an anesthetic medication that may be used with local anesthetic block with maximum benefit and minimal side effects because local anesthetic alone has been linked to anxiety, vertigo, claustrophobia, and earaches.[4] To improve patient and surgeon comfort during middle ear surgery, a range of medications, including propofol, benzodiazepines, and opioids, are used for hypnosis, sedation, and analgesia. Nevertheless, none of these medications has proven totally devoid of complications. Several problems have been documented, including respiratory depression, confusion, excessive sedation, and impaired patient participation during the surgical procedure.[5]A centrally acting α-2 receptor agonist, dexmedetomidine (dexM) has a hypnotic and analgesic effect without respiratory depression. It has been observed to drastically lower the need for opioids both during and following surgery. Its predictable and dose-dependent hemodynamic effects make it a valuable anesthetic and analgesic sparing agent.[6]The present study evaluated the use of dexmedetomidine infusion as anaesthetic adjuvant during middle ear surgery.

MATERIALS & METHODS

The present study comprised of 56patients undergoing elective middle ear surgery of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups of 28 patients each. Group I patients received infusion of dexmedetomidine 0.5 µg/kg/hour and group II patients received placebo infusion of normal saline during middle ear surgery after induction of anaesthesia till 20 minutes before completion of surgery. Parameters such as bleeding at surgical field, haemodynamic changes, awakening time and

post-operative recovery. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Recording of surgical time

Groups	Mean	P value
Group I	97.4	0.05
Group II	106.2	

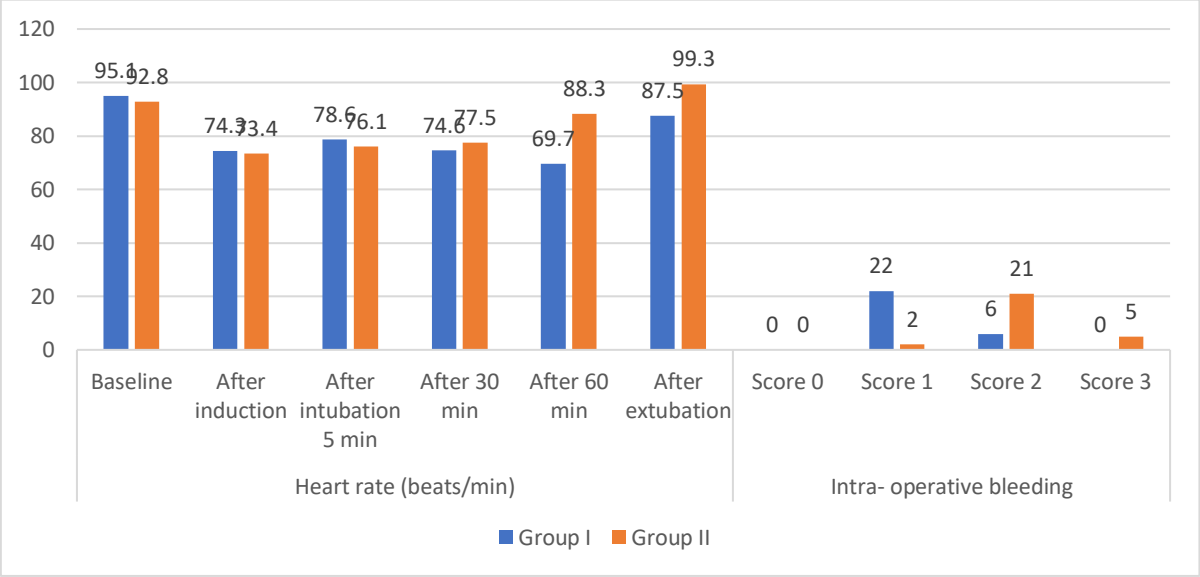
Table I shows that meansurgical time in group I was 97.4 minutes and in group II was 106.2 minutes.

Table II Comparison of parameters

Parameters	Variables	Group I	Group II	P value
Heart rate (beats/min)	Baseline	95.1	92.8	0.05
	After induction	74.3	73.4	
	After intubation 5 min	78.6	76.1	
	After 30 min	74.6	77.5	
	After 60 min	69.7	88.3	
	After extubation	87.5	99.3	
Intra- operative bleeding	Score 0	0	0	0.02
	Score1	22	2	
	Score2	6	21	
	Score3	0	5	

Table II, graph I shows that mean heart rate (beats/min) at baseline in group I was 95.1 and in group II was 92.8, after induction was 74.3 in group I and 73.4 in group II, after intubation 5 min was 78.6 in group I and 76.1 in group II, after 30 min was 74.6 in group I and 77.5 in group II, after60 min was 69.7 in group I and 88.3 in group II and after extubation was 87.5 in group I and 99.3 in group II. Intraoral bleeding score 1 was seen in 22 in group I and 2 in group II and score 2 in 6 in group I and 21 in group II. Score 3 was seen in 5 in group II. The difference was significant (P< 0.05).

Graph I Comparison of parameters



DISCUSSION

Numerous studies have documented the effective use of dexM as the main sedative for orthopedic, ophthalmology, dental, and plastic surgery operations, as well as diagnostic ones. DexM is increasingly being used as a sedative for monitored anesthesia care because of its analgesic qualities, cooperative sedation, and lack of respiratory depression.[7]DexM also has a sympatholytic effect, which can lessen the stress response to surgery (tachycardia and hypertension) and preserve hemodynamic stability.[8]DexM is likely to lower MAP because it blocks norepinephrine release by stimulating the α-2 adrenoceptor and reduces central sympathetic outflow.[9,10]The present study evaluated the use of dexmedetomidine infusion as anaesthetic adjuvant during middle ear surgery.

We found that mean surgical time in group I was 97.4 minutes and in group II was 106.2 minutes. The patients in the Bekker et al[11] study were given a

loading dose of 1 µg/kg of dexmedetomidine over a 10-minute period, and then they were continuously infused with 0.5 µg/kg/h. The researchers found that intraoperative dexmedetomidine infusion was successful in attenuating the perioperative hemodynamic responses, with no incidence of bradycardia or hypotension.

We observed that mean heart rate (beats/min) at baseline in group I was 95.1 and in group II was 92.8, after induction was 74.3 in group I and 73.4 in group II, after intubation 5 min was 78.6 in group I and 76.1 in group II, after 30 min was 74.6 in group I and 77.5 in group II, after 60 min was 69.7 in group I and 88.3 in group II and after extubation was 87.5 in group I and 99.3 in group II. Intraoral bleeding score 1 was seen in 22 in group I and 2 in group II and score 2 in 6 in group I and 21 in group II. Score 3 was seen in 5 in group II. In contrast to propofol, Verma et al[12]evaluated the safety and effectiveness of intravenous dexmedetomidine. Eighty patients were randomized at random to receive an intravenous bolus of either propofol or dexmedetomidine, followed by an infusion of the same drug enhanced with local anesthesia for tympanoplasty. Adequate sedation is achieved with dexmedetomidine and propofol; however, the latter is linked to increased need for rescue analgesia and unsatisfactory outcomes for both the patient and the surgeon.

Sixty-four adult patients, ages 18 to 58, with American Society of Anaesthesiologists Grades I and II, of both genders, participated in a study by Gupta et al.[13] They were randomly assigned to two equal groups of 32 patients each, each for middle ear surgery under general anesthesia using a standard anesthetic technique. Patients in Group I received a 0.5 µg/kg/h infusion of dexmedetomidine after general anesthesia was induced, while patients in Group II received a normal saline placebo infusion. In order to attain a systolic blood pressure that was 30% lower than the baseline, the isoflurane concentration was titrated. Patients receiving dexmedetomidine infusion showed a statistically significant decrease in the percentage of isoflurane required (0.8 ± 0.6%) to maintain the systolic blood pressure 30% below the baseline values when compared to those receiving

CONCLUSION

Authors found that it was safe to use dexmedetomidine infusion to create an oligaemic operative field for improved visibility during middle ear surgery performed under an operating microscope.

REFERENCES

1. Lee YY, Wong SM, Hung CT. Dexmedetomidine infusion as a supplement to isoflurane anaesthesia for vitreoretinal surgery. Br J Anaesth2007;98:477-83.
2. Tanskanen PE, Kyttä JV, Randell TT, Aantaa RE. Dexmedetomidine as an anaesthetic adjuvant in patients undergoing intracranial tumour surgery: A double-blind, randomized and placebo-controlled study. Br J Anaesth2006;97:658-65.
3. Yildiz M, Tavlan A, Tuncer S, Reisli R, Yosunkaya A, Otelcioglu S. Effect of dexmedetomidine on haemodynamic responses to laryngoscopy and intubation: Perioperative haemodynamics and anaesthetic requirements. Drugs R D 2006;7:43-52.
4. Jellish WS, Owen K, Edelstein S, Fluder E, Leonetti JP. Standard anesthetic technique for middle ear surgical procedures: A comparison of desflurane and sevoflurane. Otolaryngol Head Neck Surg2005;133:269-74.
5. Marchal JM, Gómez-Luque A, Martos-Crespo F, Sánchez De La Cuesta F, Martínez-López MC, Delgado-Martinez AD. Clonidine decreases intraoperative bleeding in middle ear microsurgery. Acta Anaesthesiol Scand 2001;45:627-33.
6. Ayoglu H, Yapakci O, Ugur MB, Uzeen L, Altunkaya H, Ozer Y, et al. Effectiveness of dexmedetomidine in reducing bleeding during septoplasty and tympanoplasty operations. J Clin Anaesth2006;53:646-52.
7. Sudheesh K, Harsoor S. Dexmedetomidine in anaesthesia practice: A wonder drug? Indian J Anaesth2011;55:323-4.
8. Patel A, Davidson M, Tran MC, Quraishi H, Schoenberg C, Sant M, et al. Dexmedetomidine infusion for analgesia and prevention of emergence agitation in children with obstructive sleep apnea syndrome undergoing tonsillectomy and adenoidectomy. AnesthAnalg2010;111:1004-10.
9. Hall JE, Uhrich TD, Barney JA, Arain SR, Ebert TJ. Sedative, amnestic, and analgesic properties of small-dose dexmedetomidine infusions. AnesthAnalg2000;90:699-705.
10. Firat Y, Kizilay A, Akarcay M, Yucel A, But K, Yologlu S. The effect of dexmedetomidine on middle ear pressure. Otolaryngol Head Neck Surg2007;137:218-23.
11. Bekker A, Sturaitis M, Bloom M, Moric M, Golfinos J, Parker E, et al. The effect of dexmedetomidine on perioperative hemodynamics in patients undergoing craniotomy. AnesthAnalg2008;107:1340-7.
12. Verma R, Gupta R, Bhatia V K, Bogra J, Agarwal S P. Dexmedetomidine and propofol for monitored anesthesia care in the middle ear surgery. Indian J Otol2014;20:70-4.
13. Gupta K, Bansal M, Gupta PK, Pandey M N, Agarwal S. Dexmedetomidine infusion during middle ear surgery under general anaesthesia to provide oligaemic surgical field: A prospective study. Indian J Anaesth2015;59:26-30.