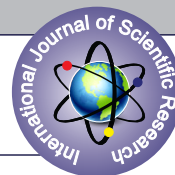


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TO ASSESS EFFICACY AND SAFETY OF INTRAVENOUS DEXMEDETOMIDINE AND PROPOFOL AS SEDATIVE AND ANALGESIC WITH THEIR HEMODYNAMIC EFFECTS AMONG PATIENTS UNDERGOING TYMPANOPLASTY UNDER MONITORED ANAESTHETIC CARE



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ABSTRACT

Background: Due to its analgesic properties, cooperative sedation and lack of respiratory depression, Dexmedetomidine is increasingly being used as a sedative for monitored anaesthesia care. **Materials and methods:** The present study was planned to compare propofol and Dexmedetomidine for analgesic, sedative and hemodynamic effects in tympanoplasty under local anaesthesia under monitored anaesthesia care. Two groups with 39 patients in dexmedetomidine group (D) and 37 patients in propofol group (P) were taken. All the patients were in the age group of 18 to 60 years belonging to ASA status I or II. Results: The mean values of intraoperative respiratory rate and oxygen saturation at different intervals among two groups were statistically not significant (P value of >0.05). The mean systolic blood pressure was found to be lower in patients of group P as compared to group D with p value of <0.05 . Majority of the patients were satisfied in group D as compared to group P (P-0.0012). Patients receiving Dexmedetomidine had a better surgical field as compared to patient of group P ($p < 0.05$). Majority of the patients (40.54%) in group P required fentanyl requirement intraoperatively as compared to group D (10.25%) (p value 0.002). **Conclusion:** Dexmedetomidine and propofol provides adequate sedation but the use of propofol is associated with more requirements of rescue analgesia and poor patient and surgeon satisfaction. These results suggest that dexmedetomidine provides adequate sedation with analgesia and good surgical and patient comfort without any adverse effects for patients undergoing tympanoplasty under local anaesthesia.

KEYWORDS

Dexmedetomidine, Propofol, Monitored anaesthesia care

INTRODUCTION

Monitored anaesthesia care (MAC) has been used to provide sedation, comfort, memory loss and relief from anxiety during various procedures on middle ear. Several drugs used for sedation during surgical procedure under MAC including benzodiazepines, opioids, propofol.^{1,2} Dexmedetomidine has become of the frequently used drugs in anaesthetic armamentarium due to its haemodynamic, sedative, anxiolytic, analgesic, neuroprotective and anaesthetic sparing effects.³⁻⁹ Propofol is a widely used sedative-hypnotic with a rapid onset of action, short recovery time along with antiemetic and euphoric properties.¹⁰

AIMS AND OBJECTIVE

1. To assess efficacy and safety of intravenous Dexmedetomidine and Propofol as sedative and analgesic with their hemodynamic effects among patients undergoing tympanoplasty under monitored anaesthetic care.
2. To note patients and surgeons satisfaction and side effects (hypotension, bradycardia) of the drugs used.

MATERIALS AND METHODS

After approval from Ethical committee, well informed written consent was taken from all patients. A total of 80 patients in the age group of 18-60 belonging to ASA physical status I and II of either sex attending ENT Department to undergo tympanoplasty under local anaesthesia were enrolled for the study. After Preoperative evaluation, premedication were given to all patients. Patients were grouped and received the drugs as follows

Group p: Received a loading dose of injection propofol 75ug/kg/min intravenously over 10 min and maintenance infusion was continued during operation at a rate of 50ug/kg/min.

Group D: Received a loading dose of dexmedetomidine 1 ug/kg over 10 minutes and maintenance infusion was continued during the operation at a rate of 0.4 ug/kg/hr. (Dexmedetomidine was diluted in 0.9% normal saline to a target concentration of 4ug/ml)

Methods of measurement of outcome of interest:

- 1) Pain was assessed by Numeric Rating Scale (NRS) 0-10

Numeric rating scale

0 1 2 3 4 5 6 7 8 9 10

Instruct the patient to point to the position on the line to indicate how

much pain they are currently feeling. The far left indicates 'No pain' and the far right indicates 'worst pain ever'.

- 2) Sedation was assessed by Ramsay Sedation scale (0-6).

Ramsay Sedation Scale

Patient anxious, agitated and restless.	1
Patient cooperative, oriented and tranquil	2
Patient responding only to verbal commands	3
Patient with brisk response to light glabella tap or loud auditory stimulus	4
Patient with sluggish response to light glabella tap or loud auditory stimulus.	5
Patient with no response to light glabella tap or loud auditory stimulus	6

- 3) Hemodynamic and respiratory parameters i.e. blood pressure, Heart rate and SP_{O_2} before administering loading drug and after every 15 minutes till the end of procedure.

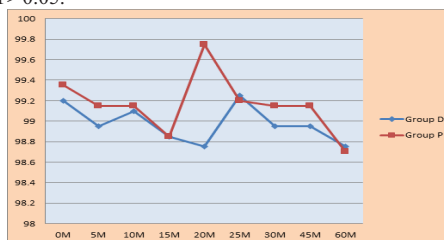
- 4) Adverse side effects i.e. bradycardia ($HR < 50$), hypotension ($MAP < 60$).

- 5) Rescue analgesia fentanyl 1 ug/kg of body wt.

Statistical analysis: The patients were selected and randomized by computer generated random numbers. Continuous variables were summarized as mean and standard deviation. Chi-square test was used to test independence between two categorical variables. Differences between two mean was analyzed using independent samples t test.

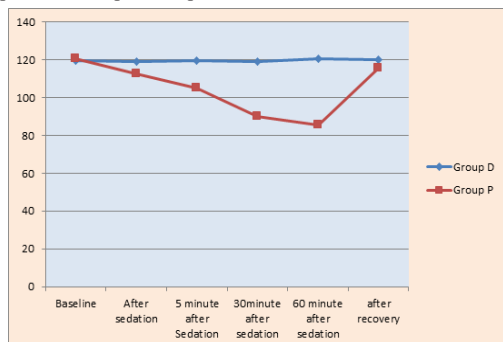
RESULTS AND OBSERVATION

The mean values of intraoperative oxygen saturation at different intervals among two groups were statistically not significant with a p value of >0.05 .

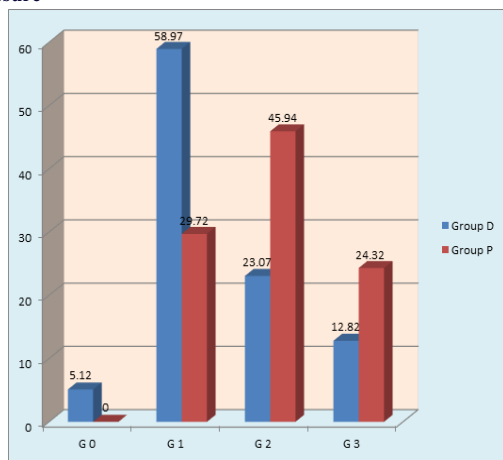


Graphical Representation of Intra Operative Oxygen Saturation (%)

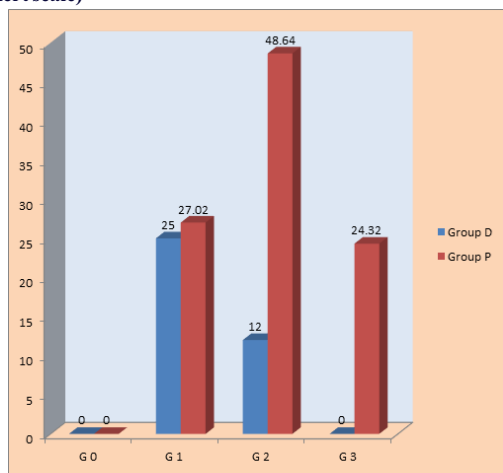
The mean systolic blood pressure values shows statically significant difference during intraoperative period between the groups. The mean systolic blood pressure was found to be lower in patients of Group P as compared to Group D with p value of <0.05 as shown in table:9.



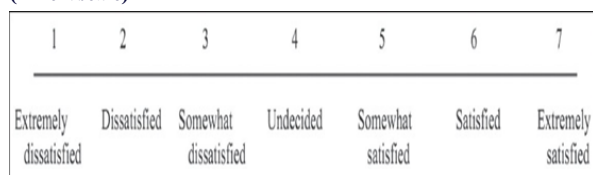
Graphical Representation of Intra Operative Systolic blood pressure



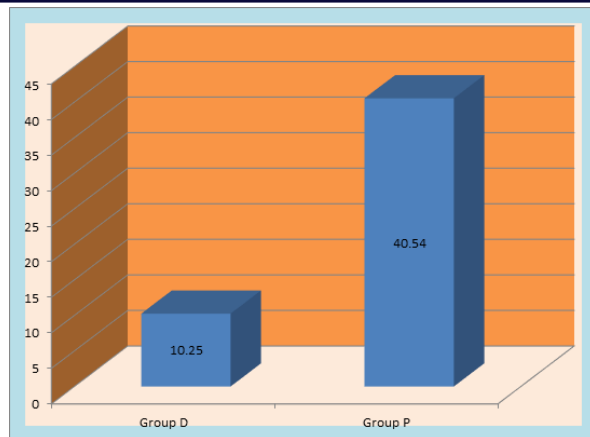
Graphical Representation of Degree of patient satisfaction (Likert scale)



Graphical Representation of Degree of surgeon satisfaction (Likert scale)



Seven-point Likert like verbal rating scale for patient and surgeon satisfaction



Graphical Representation of No. of patients required Fentanyl intraoperative

Table 18: Complications/Adverse Effects

Variables	Group D (n=39)	%	Group P (n=37)	%	P value	Remarks
Nausea	4	10	3	7.5	0.48	NS
Vomiting	2	5	1	2.5	0.08	NS
Dry mouth	8	20	5	12.5	0.55	NS
Hypotension	2	5	10	25	0.03	S
Bradycardia	2	5	0	0	0.49	NS

DISCUSSION

The present study was planned to compare propofol and Dexmedetomidine for analgesic, sedative and hemodynamic effects in tympanoplasty under local anaesthesia under monitored anaesthesia care. Two groups with 39 patients in dexmedetomidine group (D) and 37 patients in propofol group (P) were taken. All the patients were in the age group of 18 to 60 years belonging to ASA status I or II.

The two groups were homogenous with reference to age, ASA status, body weight and duration of surgery.

In our study, we have demonstrated that both Dexmedetomidine and propofol provide adequate levels of sedation without clinically significant respiratory depression in the perioperative period, but use of propofol is associated with increased requirement of intraoperative rescue analgesic, majority of the patients (40.54%) in group P required Fentanyl requirement intraoperatively as compared to group D only (10.25%) of patients required Fentanyl requirement intraoperatively and increased hemodynamic instability (hypotension). This is consistent with the findings of Sangeeta Bansal Agarwal et al.¹¹

Blood pressure was significantly decreased in Group P as compared to Group D. Results similar to our study were observed by Arain, et al.¹²; Al-Mustafa, et al.¹³ and Mahmoud, et al.¹⁴

In our study, we observed that, two patients in Dexmedetomidine group developed bradycardia, which were successfully managed with injection atropine.¹⁵

Our results suggest that dexmedetomidine provides adequate sedation with analgesia and good surgical and patient comfort without any adverse effects for patients undergoing tympanoplasty under local anaesthesia. Our results are accordance with the study done by Saurab A et al.¹⁶

Both surgeon comfort and patient satisfaction regarding sedation was more in D group.

CONCLUSION

Dexmedetomidine and propofol provides adequate sedation but the use of propofol is associated with more requirements of rescue analgesia and poor patient and surgeon satisfaction. These results suggest that dexmedetomidine provides adequate sedation with analgesia and good surgical and patient comfort without any adverse effects for patients undergoing tympanoplasty under local anaesthesia.

REFERENCES

- Ghisi D, Fanelli A, Tosi M et al. Monitored anaesthesia care. *Minerva Anestesiol.*

- 2005;71:533-8.
2. Lee JJ, Lee JH. Middle ear surgery under sedation. Comparison of midazolam alone or midazolam with remifentanyl. *J Laryngol Otol*, 2011; 125: 561-6.
3. Bloor BC, Ward DS, Belleville JP, Maze M. Effects of intravenous Dexmedetomidine in humans, II: Hemodynamic changes. *Anesthesiology* 1992;77:1134-42.
4. Ebert T, Hall JE, Barney JA, Uhrich TD, Colino MD. The effects of increasing plasma concentrations of dexmedetomidine in humans. *Anesthesiology* 2000;93:382-94.
5. 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. *Anesth Analg* 2008;107:1340-7.
6. Sağiroğlu AE, Celik M, Orhon Z, Yüzer S, Sen B. Different doses of dexmedetomidine on controlling haemodynamic responses to tracheal intubation. *Int J Anesthesiol* 2010;27:2.
7. Turan G, Özgültekin A, Turan C, Dincer E, Yuksel G. Advantageous effects of dexmedetomidine on haemodynamic and recovery responses during extubation for intracranial surgery. *Eur J Anaesthesiol* 2008;25:816-20.
8. Aksu R, Akın A, Biçer C, Esmaoğlu A, Tosun Z, Boyacı A. Comparison of the effects of dexmedetomidine versus fentanyl on airway reflexes and hemodynamic responses to tracheal extubation during rhinoplasty: A double-blind, randomized, controlled study. *Current Therapeutic Research* 2009;70: 209-220.
9. Tan JA, Ho KM. Use of dexmedetomidine as a sedative and analgesic agent in critically ill adult patients: A meta-analysis. *Eur J Anaesthesiol* 2011;28:3-6.
10. Jellish WS, Leonetti JP, Murdoch JR, et al. Propofol-based anesthesia as compared with standard anesthetic techniques for middle ear surgery. *J Clin Anesth* 1995;7(4):292-6.
11. Dr. Sangeeta Bansal Agarwal, Dr. Shashank Shekhar, Dr. Sanjivani Karmarkar, Dr. Ankit Gupta, Dr. Rahul Gupta, comparative Study Of Intravenous Dexmedetomidine And Intravenous Propofol Infusion For Monitored Anesthesia Care In Patients Undergoing Tympanoplasty Under Local Anesthesia, *European Journal of Pharmaceutical and Medical Research* ejpmr, 2017,4(1), 102-107.
12. Arain SR, Ebert TJ. The efficacy, side effects and recovery characteristics of dexmedetomidine versus propofol when used for intraoperative sedation. *Anesth Analg*. 2002; 95: 461-6. [PubMed: 12145072].
13. Al-Mustafa MM, Badran IZ, Abu-Ali HM, Al-Barazangi BA, Massad IM, Al-Ghanem SM. Intravenous dexmedetomidine prolongs bupivacaine spinal analgesia. *Middle East J Anaesthesiol*. 2009; 20: 225-31.
14. 15. Mahmoud M, Gunter J, Donnelly LF, Wang Y, Nick TG, Sadhasivam S. A comparison of dexmedetomidine with propofol for magnetic resonance imaging sleep studies in children. *Anesth Analg*. 2009; 109: 745-53.
15. Hogue CW Jr, Talke P, Stein PK, Richardson C, Domitrovich PP, Sessler DI. Autonomic nervous system responses during sedative infusions of dexmedetomidine. *Anesthesiology* 2002;97:592-8.
16. Dexmedetomidine for monitored anesthesia care in patients undergoing liberation procedure for multiple sclerosis; An observational study: