Original Article

Comparison of two different doses of intravenous dexmedetomidine on intubating conditions during awake fibreoptic nasotracheal intubation

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ABSTRACT
Background: The present study was conducted for comparing two different doses of intravenous dexmedetomidine on intubating conditions during nasotracheal intubation. **Materials & methods:** A total of 40 patients were enrolled (20 patients in each group). Every patient received medication as IV infusion for 15 mins according to the randomization which was done earlier using computer generated random numbers: Group A: received an infusion of 1.5mcg/kg dexmedetomidine diluted in 50 ml saline, and Group B: received an infusion of 0.5mcg/kg dexmedetomidine diluted in 50 ml saline. Awake fibreoptic intubation was done after standardized airway preparation in both the groups. Five-point fiberoptic intubation comfort score was used. A post-operative visit was undertaken the day after operation during which the level of recall, adverse events and satisfaction scores (1 = excellent, 2 = good, 3 = fair, 4 = poor) were also be assessed. All the results were recorded in Microsoft excel sheet and were analysed using SPSS software. **Results:** While comparing the five-point fiberoptic intubation comfort score in between the two study groups, non-significant results were obtained.While comparing statistically the post-op anxiety score, significant better results were seen among patients of group A while poor results were seen among patients of group A. Non-significant results were obtained while comparing the incidence of hoarseness and sore throat among the patients of all the three study groups. While comparing statistically the patient satisfaction score, significantly better results were seen among patients of group B while poor results were seen among patients of group A. **Conclusion:** Lower plasma concentrations of dexmedetomidine may be used to provide sedation and mild analgesia while preserving memory and cardiovascular and respiratory functions.
Key words: Dexmedetomidine, Nasotracheal, Intubation.

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INTRODUCTION

Awake intubation is considered a safe approach in the airway management of a patient with burn contracture of the neck, oral and maxillofacial trauma, for orthognathic surgeries particularly for cases presenting with the combination of difficult laryngoscopy as well as difficult mask ventilation.[1] Awake fibre-optic intubation (AFOI) is an indivisible part of anaesthetic management in patients whose airway access is expected to be difficult.[2] The ideal sedative for AFOI would provide anxiolysis and a degree of amnesia with a low incidence of recall of the procedure. It would have analgesic properties, suppress the cough and gag reflex, and be safe and easy to titrate with minimal respiratory and cardiovascular side effects.[3] Dexmedetomidine, a selective α-2 adrenoceptor agonist, provides conscious sedation, attenuation of sympathoadrenal response, anxiolysis and analgesia without causing clinically relevant respiratory depression in AFOI.[4] Unlike patients sedated with propofol, patients receiving dexmedetomidine are easily aroused to cooperate with medical procedures without expressing irritation. The relative sympatholysis achieved during dexmedetomidine infusions is an additional benefit in a procedure that may lead to elevations of heart rate and blood pressure.[5] Hence; the present study was conducted for comparing two different doses of intravenous dexmedetomidine on intubating conditions during awake fibreopticnasotracheal intubation.

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MATERIALS & METHODS

The present study was conducted for comparing two different doses of intravenous dexmedetomidine on intubating conditions during nasotracheal intubation. We included American Society of Anesthesiologists (ASA) class I or class II patients of either sex, between 18-60 years, decreased mouth opening and surgeries dealing with oral malignancy or oro-maxillo-facial surgery with a plan for awake nasal fiberoptic intubation. A thorough preanesthetic evaluation including detailed history, general physical examination, and systemic examination was done a day prior to the surgery. A total of 40 patients were enrolled (20 patients in each group). Every patient received medication as IV infusion for 15 mins according the randomization which was done earlier using computer generated random numbers: Group A: received an infusion of 1.5mcg/kg dexmedetomidine diluted in 50 ml saline, and Group B: received an infusion of 0.5mcg/kg dexmedetomidine diluted in 50 ml saline. Five-point fiberoptic intubation comfort score was used which was as follows:

Score 1: No reaction
Score 2: Slight grimacing
Score 3: Heavy grimacing
Score 4: Verbal objection
Score 5: Defensive movement of head and hands

A post-operative visit was undertaken the day after operation during which the level of recall, adverse events and satisfaction scores (1 = excellent, 2 = good, 3 = fair, 4 = poor) were also be assessed. All the results were recorded in Microsoft excel sheet and were analysed using SPSS software.

RESULTS

Mean age of the patients of group A and Group B was 43.5 years and 45.4 years respectively. 60 percent of the patients of group A and 70 percent of the patients of group B were males while the remaining were females. The demographic data was found to be statistically comparable. While comparing the five-point fiberoptic intubation comfort score in between the two study groups, non-significant results were obtained as shown in Table 1. While comparing statistically the post-op anxiety score, significant better results were seen among patients of group A while poor results were seen among patients of group A as can be depicted by Table 2. Non-significant results were obtained while comparing the incidence of hoarseness and sore throat among the patients of all the three study groups. While comparing statistically the patient satisfaction score, significant better results were seen among patients of group B while poor results were seen among patients of group A. (Table 3)

Table 1: Distribution of patients according to Intubation score

Variable		Group A	Group B	p-value
Five-point fiberoptic intubation comfort score	Score 1: No reaction	50	55	0.45
	Score 2: Slight grimacing	25	30	
	Score 3: Heavy grimacing	15	5	
	Score 4: Verbal objection	5	5	
	Score 5: Defensive movement of head and hands	5	5	

Table 2: Post Op recall and anxiety

Post Op recall and anxiety	GROUP A		GROUP B		p- value
	N	%	n	%	
1 (Excellent)	9	45	7	35	0.00*
2 (Good)	3	15	7	35	
3 (Fair)	3	15	5	25	
4 (Poor)	5	25	1	5	
Total	20	100	20	100	

*: Significant

Table 3: Satisfaction Score

Satisfaction score	GROUP A		GROUP B		p- value
	N	%	n	%	
1 (Excellent)	10	50	15	75	0.00*
2 (Good)	5	25	3	15	
3 (Fair)	3	15	1	5	
4 (Poor)	2	10	1	5	
Total	20	100	20	100	

*: Significant

DISCUSSION

Nasotracheal intubation is often preferable to oral intubation in maxillofacial surgery. Many of the maxillofacial trauma patients have reduced or distorted mouth opening. Ankylosis of the Temporomandibular joint may also lead to decreased mouth opening. Orotracheal intubation becomes nearly impossible in such cases. Nasotracheal intubation also provides unrestricted access to the mouth, which facilitates the insertion of instruments. Fiberoptic intubation is a very useful technique for patients with an anticipated difficult airway, such as those with

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reduced mouth opening due to infection, temporomandibular joint problems, or jaw fracture. With difficult airways, the anatomy is often deviated from normal, and comorbid conditions may lead to complete loss of the airways. Thus, close attention must be devoted to the anesthetic drugs and dosages used to achieve sedation and analgesia for nasal intubation. The ideal sedation technique enables patients to maintain spontaneous ventilation, to be cooperative, and to tolerate passage of a fiberscope to facilitate nasotracheal intubation. It is important for patients undergoing sedated—but awake—fiberoptic intubation to have decreased anxiety, discomfort, and hemodynamic disturbances.[6-9]

During awake intubation, laryngospasm and coughing in response to intubation can be troublesome. Thus, effective topical airway anesthesia is mandatory for the comfort of the awake patient and subsequent successful airway instrumentation. Profound topical anesthesia of the airway also reduces the need for higher doses of sedatives and analgesics such as midazolam and fentanyl.[6-9] Hence; the present study was conducted for comparing two different doses of intravenous dexmedetomidine on intubating conditions during awake fibreopticnasotracheal intubation.

Mean age of the patients of group A and Group B was 43.5 years and 45.4 years respectively.60 percent of the patients of group A and 70 percent of the patients of group B were males while the remaining were females. While comparing the five-point fiberoptic intubation comfort score in between the three study groups, non-significant results were obtained.While comparing statistically the post-op anxiety score, significant better results were seen among patients of group A while poor results were seen among patients of group B. Yadav U et al compared the effectiveness of dexmedetomidine-midazolam with fentanyl-midazolam infusion for providing conscious sedation during fibreoptic intubation in patients with anticipated difficult airway under topical anaesthesia. Thirty adult patients of ASA physical status classification I and II with anticipated difficult airway and planned for elective awake nasal fibreoptic intubation under conscious sedation were randomly allocated into two groups. Dexmedetomidine 1 µg.kg-1 diluted in 50 ml saline was infused in Group DM over 10 min and Fentanyl 2 µg.kg-1 diluted in 50 ml saline was infused in Group FM over 10 min. Topicalization of the airway was done in all patients. All patients were assessed for sedation score, ease of endotracheal tube placement, patient comfort and cooperation, tolerance to endotracheal tube, any adverse events and recall of procedure. The score of the modified OAA/S was comparable between the groups ($P > 0.05$). Quality of AFOI was comparable in both groups ($P > 0.05$). The intubation time and first $EtCO_2$ were significantly lower in dexmedetomidine group ($P < 0.05$). Group DM also showed better hemodynamics and less episodes of desaturation than Group FM. Fentanyl-midazolam and dexmedetomidine-midazolam are both effective for awake fiberoptic intubation under topical anesthesia. Dexmedetomidine allows better endurance and more stable hemodynamics.[10]

In the present study, non-significant results were obtained while comparing the incidence of hoarseness and sore throat among the patients of all the three study groups. While comparing statistically the patient satisfaction score, significant better results were seen among patients of group B while poor results were seen among patients of group A. Jamgade D et al compared the efficacy and safety of dexmedetomidine versus dexmedetomidine and ketamine for sedation during awakefibreoptic intubation (FOI) in patients posted for elective surgeries. Ninety-eight American Society of Anesthesiologists Physical Status (ASA-PS) I–II patients with difficult airway and scheduled for elective surgeries were enrolled in this study after institutional ethics committee approval. Patients were randomly allocated into 2 groups, i.e. 49 patients in each group. Group D patients received 1 µg/kg dexmedetomidine IV over 10 min in 100-mL normal saline followed by a continuous infusion at 0.5 µg/kg/h till FOI and 5-mL normal saline followed by saline infusion. Group DK patients received 1 µg/kg dexmedetomidine IV over 10 min in 100-mL normal saline. Further, they received IV ketamine 15 mg as a bolus of 5 mL, followed by continuous infusion of ketamine at 20 mg/h until the end of intubation. The primary objective was to compare the efficacy of the combination of IV dexmedetomidine and ketamine with IV dexmedetomidine alone as sedation for FOI. Vocal cord movement, sedation, coughing, facial grimace score, recall of procedure, and haemodynamics were also compared in both groups. emographic data, vocal cord movement, cough score, facial grimace score, total drugs used, hoarseness, sore throat and level of recall were comparable in both groups. Haemodynamics were significantly better in group DK at 2, 3, 4 and 5 min compared to group D. Addition of ketamine to dexmedetomidine did not improve intubating conditions, reduce cough or improve recall of FOI. However, patients remain sedated when ketamine was used with dexmedetomidine.[11]

CONCLUSION

Lower plasma concentrations of dexmedetomidine may be useful to provide sedation and mild analgesia while preserving memory and cardiovascular and respiratory functions.

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