

## A Study for dexmedetomidine for Fiberoptic intubation

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### ABSTRACT

Trauma is a major fitness hassle of modern-day society and maxillofacial injuries because of high-pace trauma from avenue visitors accidents, sports activities accidents or falls require airway renovation with cervical spine stabilisation and manage of bleeding along a unique set of problems. Compromised airway is lifestyles-threatening both within the early and later levels leading to hypoxia or obstruction. Awake fiberoptic bronchoscope (FOB)-guided endotracheal intubation (AFOI) is a powerful method for coping with patients with tough airway, and is presently taken into consideration the gold standard (eleven). Dexmedetomidine at a dose of 0.75 mcg/kg and 1.0 mcg/kg over 20 mins turned into drastically found to be powerful in maintaining sufferers comfy at some point of Awake fibre optic intubation. While 0.5 mcg/kg of loading dose had strong haemodynamics and did no longer have any adverse occasions, 1 mcg/kg of loading dose precipitated high blood pressure in 2 sufferers and 0.75 mcg/kg of loading dose triggered cardiac rhythm abnormality (ventricular ectopics) in one patient. Dexmedetomidine at a loading dose of 0.5 mcg/kg is secure, whereas loading doses of zero.75 mcg/kg and 1 mcg/kg gives better patient consolation. More quantity of research ought to be finished the use of a packing dose of 0.75 mcg/kg to set up its protection.

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### INTRODUCTION

In this section presents introduction of this research work. Awake fiberoptic intubation needs patient to be calm, relaxed, sedated and spontaneously breathing which is facilitated by pharmacological agents like fentanyl, propofol, sufentanil, remifentanil and dexmedetomidine with varying effectiveness. [1]

Dexmedetomidine, a selective alpha 2-adrenoceptor

agonist possesses analgesic, sedative, anxiolytic and sympatholytic residences during awake fiberoptic intubation, without causing respiration despair that's getting used for sedation in ICU settings, for intraoperative sedation throughout surgical procedure beneath local anesthesia, for unsleeping craniotomies, and for sedation in pediatric age institution in exclusive settings. More lately, there had been numerous case reviews of dexmedetomidine being used for AFOI and being very effective for the same. [2] In these articles represents sector 2 of these articles explains the feature on the related works. In section 3 presents the materials and methods adopted and section 4 presents the particulars of the experimentations and discussions. Finally segment 5 accomplishes the articles by allocation our implications and upcoming strategies [3]

### RELATED WORKS

In this segment represents focuses the related works of this research work, Maxillofacial trauma patients

mostly pose a specific challenge to the anaesthetist as the surgical procedure is around the upper airway, which is the mainstay for patient safety both during and after the operation. Good teamwork with both anaesthetist and surgeon is mandatory to attain good safety with minimal interruption during the surgery. Maxillofacial anaesthesia has unique and important airway problems requiring unique talent and skillful cooperation combined with experience. [4, 5]

Through search on literature was done on trauma, management of airway intrauma, difficult airway, fibreoptic intubation, sedation for fibreoptic intubation, awake fibreoptic intubation, patient comfort during fibreoptic intubation, dexmedetomidine in fibreoptic intubation, dexmedetomidine dose during fibreoptic intubation and several articles and reports were obtained which is cited in the order of discussion as below [6, 7]

- Airway trauma and management.
- Conditions and drugs for AFOI.
- Different drugs used for awake fibreoptic intubation.
- Different dose of dexmedetomidine for awake fibreoptic intubation.

Incidence of problematic route is 1%–18% during clinical anaesthesia and 30% of all deaths attributable to anaesthesia is connected to problematic airway management.

No single technique of intubation is favourable in cases of maxillofacial trauma including blind nasal intubation, nasal intubation under direct vision, oral intubation, submental intubation and tracheostomy. But in panfacial trauma, for surgical ease and indication nasal intubation is required. [8]

In a retrospective study Chetan B Raval et al in 177 patients for elective and emergency surgery for maxillofacial trauma in both adults (70%) and pediatric patients (30%), routine oral or nasal intubation under general anesthesia was used in 75% patients. with fibreoptic guided nasal intubation under conscious sedation or general anesthesia required in 25 % patients. With fiberoptic bronchoscopic intubation, which is now the gold standard in difficult airway management, they showed invasive airway methods like tracheostomy and submental intubation could be avoided. The patients with different types of craniofacial trauma and fractures, in a view to find effectiveness and safety of retromolar intubation reviewed various methods for difficult airway management including oral intubation for orbital floor fractures, fibreoptic intubation for mandible fractures, with only patients with nasal bone frac-

ture excepted from the study. It was found retromolar intubation technique was effective and safe in management of unilateral comminuted zygomatic fracture, maxillary fracture, and LeFort II fracture patients. [9, 10]

## MATERIALS AND METHODS

In this segment represents the materials and methods of this research work. This study was conducted in the Department of Anaesthesiology, Chennai. [11, 12]

Type of study

Prospective Double Blind Randomised Study involving 100 patients.

Randomisation Method

Computer generated randomisation code.

The study was started after receiving Institutional Human Ethical Committee approval and consent written agreement from all 100 patients and they were haphazardly divided into three groups of twenty each namely,

GROUP I— {n-20} Patients received 50ml normal saline having 0.5 mcg/kg dexmedetomidine over 20 minutes before procedure-AFOI

GROUP II— {n-20} Patients received 50 ml normal saline having 0.75 mcg/kg dexmedetomidine over 20 minutes before procedure-AFOI

GROUP III— {n-20} Patients received 50 ml normal saline having 1 mcg/kg dexmedetomidine over 20 minutes before procedure-AFOI [13, 14] [15]

## Inclusion Criteria

1. American society of Anesthesiology status 1 and 2 patients
2. Age between 18 to 60 years
3. Patients requiring awake fibreoptic intubation.

## Exclusion Criteria

1. Patients refusal for awake intubation
2. Patients with bradycardia, any type of atrioventricular block on the ECG and heart failure
3. Pregnant patients
4. Patients requiring emergency surgery
5. History of allergy to study drugs
6. Patients with coagulation disorders or on anticoagulation therapy

## MATERIALS

1. Fiberoptic bronchoscope-Olympus BF type TE2
2. Drugs for the study:

- Dexmedetomidine
- Normal saline
- 2% lignocaine with adrenaline
- 4% lignocaine
- Distilled water
- Nasaopharyngeal airway-different sizes
- Syringe pump

## METHODS

### Pre Op Preparation

Patients were pre-operatively assessed and the procedure become defined to the patient. Written knowledgeable consent changed into received. They have been assessed with unique interest to any contraindications.

### Conduct of anaesthesia

On arrival of the patient inside the running room, video display units like pulse oximeter, non-invasive blood pressure and ECG had been linked and baseline values had been recorded. An 18 G intravenous get admission to become obtained.

## RESULTS AND DISCUSSION

In this segment focuses the results and discussions of this research work. The present study was conducted to find out the most effective loading dose of dexmedetomidine for AFOI between three doses 0.5 mcg/kg, 0.75 mcg/kg, and 1.0 mcg/kg over 20 minutes by assessing the haemodynamic parameters and patient comfort levels. Conceptually, a loading dose is required for dexmedetomidine that is given over a epoch of time shadowed by an infusion of the same with dose ranging from 0.2 mcg/kg/hr to 1.0 mcg/kg/hr with haemodynamic monitoring. David Cattano studied dexmedetomidine for sedation during AFOI used 0.4 mcg/kg as loading dose over 10 minutes shadowed by an infusion of 0.7mcg/kg/hr, finding dexmedetomidine was less effective in providing appropriate conditions for AFOI. This showed that a loading dose of 0.4 mcg/kg as was ineffective which was similar to our observation. Tsai et al also used 1.0 mcg/kg as loading dose for dexmedetomidine over 10 minutes for AFOI. Similarly, Bergese et al in his study on patients undergoing AFOI has used 1.0mcg/kg loading dose of dexmedetomidine over 10 minutes trailed by an infusion of 0.7 mcg/kg/hr with monitoring haemodynamic parameters and RSS and observed that increasing the infusion time to 15 minutes was more safer and at the same time effective. So, it shows increasing the duration of infusion is safer which correlates to our study.

She-Liang Shen et al used 1.0 mcg/kg loading dose and 0.5mcg/kg infusion dose of dexmedetomidine for AFOI in his study and found no significant haemodynamic changes. In this case had used dexmedetomidine for procedural sedation at a loading dose of 1.0mcg/kg over 20 minutes shadowed by an infusion of 0.5 mcg/kg and observed no contrary measures in any of the patients. So, neither the loading dose from 0.4mcg/kg to 1.0 mcg/kg nor the time for loading dose influenced the haemodynamic parameters during AFOI showing dexmedetomidine provides appropriate intubation condition with patients being awake. So, we decided to study the efficacy of three loading doses with in this dose range i.e any adverse events and also assess the comfort level of patients during AFOI.

In our study AFOI was well tolerated in all the groups, with only three patients being excluded from the study (two from group III and one from group II) in view of adverse events. (Hypertension and Arrhythmia) With all the groups in our study we observed that there was no significant statistical alteration in systolic blood pressure ( $P=0.42$ ) and diastolic blood pressure ( $P=0.67$ ) during the loading dose and also during AFOI ( $P=0.86$ ), ( $P=0.49$ ) similar to what D.Cattano had shown in his study using dexmedetomidine at 0.4 mcg/kg bolus dose shadowed by brew at 0.7 mcg/kg /hr during AFOI. Bergese et al in his study also did not have any significant change in systolic and diastolic blood pressure during AFOI using dexmedetomidine at 1.0 mcg/kg associated to regulator group.

In our study there was statistically significant alteration in heart rate with  $P=0.04$  from start to end of AFOI among the three groups. Between the groups, there was a statistical significance during AFOI at 22 minutes for group II compared to group III ( $P=0.03$ ), group I compared to group III ( $P=0.03$ ) and at 26 minutes for group I equated to group II ( $P=0.05$ ), 0.5 mcg/kg, 0.75 mcg/kg, and 1.0 mcg/kg during AFOI and it was chosen to be given over 20 minutes to reduce

## CONCLUSION

Finally this work concludes, The present prospective, randomised study included sixty patients scheduled for AFOI and aimed to equate the haemodynamic stability of three dissimilar doses of dexmedetomidine for AFOI and to assess patients comfort level. The patients were randomly owed to three groups -Group I consisted of patients who conventional dexmedetomidine loading dose of 0.5 mcg/kg over 20 minutes for AFOI, Group II consisted of patients who received dexmedetomidine pack-

ing dose of 0.75 mcg/kg over 20 minutes for AFOI and those in Group III conventional dexmedetomidine loading dose of 1.0 mcg/kg over 20 minutes for AFOI. All patients underwent AFOI after anaesthetising the airway adequately using topical anaesthesia.

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#### CONFLICT OF INTEREST

The authors declare that they have no conflict of interest for this study.

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