

Original Research

Analysis of the effectiveness dexmedetomidine to attenuate the blood pressure response to tracheal extubation: An observational study

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ABSTRACT:

Background: The present study was conducted for analyzing the effectiveness dexmedetomidine to attenuate the blood pressure response to tracheal extubation. **Materials & methods:** A total of 20 patients were enrolled. Only those patients were included which were scheduled to undergo general surgical procedures in general anaesthesia. Group A received Dexmedetomidine and Group B received I.V. infusion of Normal Saline. Mean arterial pressure, systolic blood pressure and diastolic blood pressure was assessed at different time intervals. All the results were recorded and analyzed using SPSS software. **Results:** Majority proportion of patients of both the study groups were males. Systolic blood pressure, diastolic blood pressure and mean arterial pressure was significantly higher among patients of group B in comparison to group A at all time intervals except for baseline. However; while making intra-group comparison, non-significant results were obtained at 30 mins after extubation while comparing mean arterial pressure and DBP. **Conclusion:** Intravenous dexmedetomidine before extubation significantly attenuates the blood pressure responses to extubation.

Key words: Dexmedetomidine, Extubation

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INTRODUCTION

Deep extubation refers to the removal of a tracheal tube in a spontaneously breathing patient who is sufficiently anesthetized to obtund the laryngeal reflexes. This technique offers the advantage of a smooth extubation with less airway stimulation, thereby reducing coughing, cardiovascular stimulation, and intraocular, intracranial, and middle ear pressure changes. Removal of the tracheal tube while patients remain deeply anesthetized may be advantageous in various situations. It is particularly appealing for otologic surgery, as coughing can generate acute increases in pressure transmitted to the middle ear through the eustachian tubes, which may dislodge tympanic membrane grafts or disrupt other repairs. However, the risks of deep tracheal extubation include increased incidence of airway obstruction and aspiration.¹⁻³ The α_2 agonist dexmedetomidine is a newer sedative and analgesic agent used for sedation for up to 24 h after surgery. It provides a hemodynamic stability and appears to have no clinically important adverse effects on respiration. Its sedative properties are unique in that it produces only mild cognitive impairment, allowing

easy communication between health-care provider and patient. It does not affect the respiratory drive and therefore, it should not interfere with weaning from mechanical ventilation.⁴⁻⁶ Hence; the present study was conducted for analyzing the effectiveness dexmedetomidine to attenuate the blood pressure response to tracheal extubation.

MATERIALS & METHODS

The present study was conducted for analyzing the effectiveness dexmedetomidine to attenuate the blood pressure response to tracheal extubation. A total of 20 patients were enrolled. Only those patients were included which were scheduled to undergo general surgical procedures in general anaesthesia. Group A received Dexmedetomidine and Group B received I.V. infusion of Normal Saline. Mean arterial pressure, systolic blood pressure and diastolic blood pressure was assessed at different time intervals. All the results were recorded and analyzed using SPSS software.

RESULTS

20 patients undergoing surgeries in general anaesthesia were enrolled and were divided into two study groups- Group A received I.V. infusion of Dexmedetomidine and Group B received I.V. infusion of Normal Saline (Control). Mean age of the patients of group A and group B was 45.3 years and 43.2 years respectively. Majority proportion of patients of both the study groups were males. Systolic blood pressure, diastolic

blood pressure and mean arterial pressure was significantly higher among patients of group B in comparison to group A at all time intervals except for baseline. However; while making intra-group comparison, non-significant results were obtained at 30 mins after extubation while comparing mean arterial pressure and DBP.

Table 1: Comparison of Systolic blood pressure (SBP) at different time intervals

Systolic blood pressure	Group A	Group B	p-value
Baseline	128.1	125.6	0.441
During extubation	115.3	142.1	0.000*
1 min after extubation	119.5	145.3	0.000*
30 min after extubation	122.7	133.1	0.000*

*: Significant

Table 2: Comparison of SBP from baseline at different time intervals

Comparison with Baseline	Group A		Group B	
	Mean difference	p- value	Mean difference	p- value
Vs During extubation	-12.8	0.027*	16.5	0.000*
Vs 1 min after extubation	-8.6	0.017*	19.7	0.000*
Vs 30 mins after extubation	-5.4	0.012*	7.5	0.011*

*: Significant

Table 3: Comparison of Diastolic blood pressure (DBP) at different time intervals

Diastolic blood pressure	Group A	Group B	p-value
Baseline	72.1	71.1	0.074
During extubation	64.2	76.8	0.000*
1 min after extubation	65.3	78.9	0.037*
30 min after extubation	68.9	74.9	0.017*

*: Significant

Table 4: Comparison of DBP from baseline at different time intervals

Comparison with Baseline	Group A		Group B	
	Mean difference	p- value	Mean difference	p- value
Vs During extubation	-7.9	0.004*	5.7	0.000*
Vs 1 min after extubation	-6.8	0.001*	7.8	0.000*
Vs 30 mins after extubation	-3.2	0.084	3.8	0.076

*: Significant

Table 5: Comparison of Mean arterial pressure (MAP) at different time intervals

Mean arterial pressure	Group A	Group B	p- value
Baseline	66.4	67.3	0.645
During extubation	60.7	74.2	0.017*
1 min after extubation	61.3	76.1	0.007*
30 min after extubation	65.8	70.7	0.007*

*: Significant

Table 6: Comparison of MAP from baseline at different time intervals among both study groups

Comparison with Baseline	Group A		Group B	
	Mean difference	p- value	Mean difference	p- value
Vs During extubation	-5.7	0.002*	6.9	0.007*
Vs 1 min after extubation	-5.1	0.002*	8.8	0.001*
Vs 30 mins after extubation	-0.6	0.074	3.4	0.091

*: Significant

DISCUSSION

Tracheal extubation is the discontinuation of an artificial airway when the indications for its placement like airway obstruction, protection of airway, suctioning, ventilatory failure and hypoxemia no longer exist. For a smooth extubation, there should be no straining, movement, coughing, breath holding or laryngospasm. Extubation at light levels of anesthesia or sedation can stimulate reflex responses via tracheal and laryngeal irritation.⁶⁻¹⁰ Hence; the present study was conducted for analyzing the effectiveness dexmedetomidine to attenuate the blood pressure response to tracheal extubation.

20 patients undergoing surgeries in general anaesthesia were enrolled and were divided into two study groups- Group A received I.V. infusion of Dexmedetomidine and Group B received I.V. infusion of Normal Saline (Control). Mean age of the patients of group A and group B was 45.3 years and 43.2 years respectively. Majority proportion of patients of both the study groups were males. Systolic blood pressure, diastolic blood pressure and mean arterial pressure was significantly higher among patients of group B in comparison to group A at all time intervals except for baseline. However; while making intra-group comparison, non-significant results were obtained at 30 mins after extubation while comparing mean arterial pressure and DBP. P A Arpino et al assessed the feasibility of adding dex to facilitate extubation in a group of difficult-to-extubate patients secondary to agitation. Mechanically ventilated patients who were deemed difficult to wean and extubate secondary to agitation were evaluated for dex therapy. Inclusion

criteria were location in an intensive care unit, intubated and mechanically ventilated, required IV sedation, deemed suitable by unit criteria for weaning and extubation within 24 h of dex initiation, previous attempts at weaning sedation and/or analgesia resulted in agitation causing either severe patient ventilator dyssynchrony, prolong need for intubation, or an inability to conduct a successful SBT. Additional inclusion criteria were unsuccessful use of traditional intravenous agents to control agitation. Recommended dex dosing was a bolus of 1 microg/kg followed by an infusion of 0.2-0.7 microg/kg/h. Twenty-five patients were evaluated for dex therapy with 20 meeting the criteria to treat. All had failed prior attempts at weaning. Fourteen of the 20 patients were successfully weaned and extubated and one patient was reintubated within 48 h, giving a 65% success rate. Heart rate trended down after dex initiation in most patients but did not result in the discontinuation of dex in any patient. The addition of dex was associated with minimal changes in mean arterial pressure. Dexmedetomidine was initiated in a group of mechanically ventilated patients who failed previous attempts at weaning and extubation secondary to agitation.¹⁰ Gupta, et al compared the efficacy of dexmedetomidine with midazolam to facilitate extubation of patients from mechanical ventilation in terms of the sedative properties, cardiovascular responses, ventilation, and extubation characteristics and safety profile. A total of 40 adult, mechanically ventilated patients of either sex, aged 18-60 years, meeting the standard criteria for weaning, randomized into 2 groups of 20 patients each, received intravenous infusion of dexmedetomidine (0.2-0.7 mcg/kg/h) or midazolam (0.04-0.2 mg/kg/h) as needed for Ramsay

sedation scale 2-4. Extubation following standard extubation protocol was done. Time for extubation and vital parameters were regularly recorded. The time to extubation in the dexmedetomidine group was significantly lower than in the midazolam group. Heart rate and blood pressure was significantly lower in dexmedetomidine group than the midazolam group at most of the times. Dexmedetomidine has clinically relevant benefits compared with midazolam in facilitating extubation due to its shorter time to extubation, more hemodynamic stability, easy arousability, and lack of respiratory depression.¹¹

CONCLUSION

Intravenous dexmedetomidine before extubation significantly attenuates the blood pressure responses to extubation.

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