EFFECT OF DEXMEDETOMIDINE AND ESMOLOL ON EXTUBATION

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ABSTRACT

BACKGROUND

Complications during extubation are 3 times more than the intubation. A clinical study compares the efficacy of dexmedetomidine with esmolol in attenuating extubation stress responses in patients undergoing procedures under general anaesthesia.

MATERIALS AND METHODS

After institutional ethical committee clearance and informed consent, 90 patients of either sex between 18-60 years belonging to ASA Class I posted for elective surgical procedure under general anaesthesia were enrolled in the study. The study population was randomly divided into three groups of 30 each. Group DX received dexmedetomidine 0.005 mg/kg, Group EX received esmolol 1.5 mg/kg and Group CX received saline placebo intravenously. Various parameters regarding haemodynamics were evaluated just before, during the process and immediately after extubation. Two time intervals- one between stopping of nitrous oxide to eye opening and the other between stopping of nitrous oxide to extubation were noted. Various side effects such as desaturation, bronchospasm, laryngospasm and post-extubation cough too were recorded simultaneously. A 5-point scale was used to rate quality of extubation and Ramsay sedation scale was used to rate sedation.

RESULTS

Heart Rate (HR), Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Mean Arterial Pressure (MAP) were increased in all the groups at extubation, but was statistically and clinically significant only in control group ($p < 0.001$). Time to extubation and eye opening were prolonged in Group DX ($p < 0.001$). Incidence of coughing was 10% in Group DX when compared to 23% and 26% in Group CX and group EX respectively, which was significant ($p < 0.001$). Incidence of hypotension was 3 out of 30 in Group DX, 4 out of 30 in Group EX compared to none in Group CX, which was significant. Agitation was high in Group CX-30% and Group EX-26% than in group DX- $p < 0.001$. The patients of dexmedetomidine group were more sedated for 30 minutes post extubation. Extubation quality was better in dexmedetomidine group.

CONCLUSION

Both the drugs attenuate haemodynamic response to extubation, whereas dexmedetomidine attenuates airway reflexed during emergence from general anaesthesia and facilitates smooth extubation without undue sedation.

KEYWORDS

Extubation, Dexmedetomidine, Esmolol, Haemodynamic Response.

HOW TO CITE THIS ARTICLE: Rao SG, Sudarshan MB, Srinivas VY. Effect of dexmedetomidine and esmolol on extubation. J. Evid. Based Med. Healthc. 2017; 4(79), 4650-4655. DOI: 10.18410/jebmh/2017/930

BACKGROUND

Complications that occur during and after extubation are three times more common than that occurring during tracheal intubation and induction of anaesthesia.[1] Hypertension and tachycardia are well documented events during extubation. These haemodynamic reflexes reflect sympathoadrenal reflex stimulation (epipharyngeal and laryngopharyngeal stimulation) with concomitant increase in plasma levels of catecholamines and activation of α and β adrenergic receptors. This increase in blood pressure and heart rate are transitory, variable and unpredictable.[2] Respiratory complications associated with tracheal extubation are coughing and sore throat, laryngospasm, bronchospasm, which leads to hypoxaemia.[3] These reflexes maybe attenuated by pharmacological interventions. This study compares the efficacy of dexmedetomidine with esmolol in attenuating post-extubation stress responses in patients undergoing procedures under general anaesthesia.

Financial or Other, Competing Interest: None.
Submission 13-09-2017, Peer Review 16-09-2017,
Acceptance 30-09-2017, Published 02-10-2017.
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DOI: 10.18410/jebmh/2017/930

Aim of the Study

a) To study and compare intravenous dexmedetomidine 0.005 mg/kg given 600 seconds before vs. esmolol 1.5 mg/kg given 120 seconds before extubation on the extubation responses regarding variations in HR, SBP, DBP and MAP and airway reflexes, coughing, extubation quality, breath holding and saturation.

b) To study complications like bradycardia, hypotension and sedation.

MATERIALS AND METHODS

Method of Collection of Data- Normal adult patients of either sex, aged between 18-60 years belonging to ASA class I, without any comorbid disease, admitted for all elective surgeries under general anaesthesia with prior ethical committee clearance.

90 patients were considered for the study. They were divided randomly into 3 groups of 30 each. Sealed envelopes were used to obscure the group and each time the patient was asked to pick one and hand it over to a senior anaesthesiologist who was not involved in the study. On opening the envelope, the above anaesthesiologist would recognise the group to which the patient belonged and he was asked to prepare the drug solution.

Group CX = Saline control group.

Group DX = Dexmedetomidine group (0.005 mg/kg).

Group EX = Esmolol group (1.5 mg/kg).

Patients were premedicated with Tab. Alprazolam 0.5 mg and Tab. Ranitidine hydrochloride 150 mg orally at bedtime and kept nil per orally 6 hours before surgery.

On arrival of the patient in the operating room, IV line will be obtained with 18G cannula and will be preloaded with ringer lactate 10 mL/kg body weight before administering anaesthesia. The patients were connected to multiparameter monitor, which records HR, noninvasive measurements of SBP, DBP, MAP, ETCO2 and continuous ECG monitoring and SPO2. The baseline SBP, DBP, MAP and HR were recorded (basal parameters). The cardiac rate and rhythm were also monitored from a continuous visual display of ECG from lead II.

All patients were premedicated with Inj. Midazolam 0.02 mg/kg bodyweight and Inj. Fentanyl 0.01 mg/kg bodyweight, Inj. Ramosetron 0.3 mg, Inj. Dexamethasone 8 mg IV. Then, patients were preoxygenated for 180 seconds. Patient was induced with Inj. Pentothal Sodium 5 mg/kg bodyweight. Endotracheal intubation was facilitated with 1.5 mg/kg IV suxamethonium 60 seconds prior to laryngoscopy and intubation. Laryngoscopy and intubation were performed and after confirmation of bilateral equal air entry and capnograph, the endotracheal tube was fixed.

Anaesthesia was maintained using 50% nitrous oxide and 50% of oxygen with 1% isoflurane. Once the patients came out from suxamethonium, further neuromuscular blockade was maintained with vecuronium 0.1 mg/kg bodyweight initially and 0.01 mg/kg increments as and when required.

At the beginning of skin suturing, isoflurane is discontinued and Group DX will receive dexmedetomidine 0.005 mg/kg bodyweight diluted in 10 mL normal saline as infusion over 10 minutes using an infusion pump, whereas Group CX and Group EX will receive 10 mL normal saline over 600 seconds. Nitrous oxide will be discontinued at the end of infusion.

At the end of surgery, HR, SBP and DBP recorded serve as baseline values. Patient is reversed using Inj. Neostigmine 0.05 mg/kg and Inj. Atropine 0.02 mg/kg IV. After 120 seconds of reversal, Group EX will receive esmolol 1.5 mg/kg IV diluted to 10 mL with normal saline and Group CX and Group DX will receive 10 mL normal saline.

Patients were extubated when subjective and objective criteria were fulfilled.

Parameters Evaluated-

A. HR, SBP, DBP, MAP, SpO_2 and TOF readings - basal, prior to drug or placebo infusion; 60, 120, 300, 420 and 600 seconds during infusion; following reversal administration; post extubation every 300 seconds for 900 seconds, thereafter every 900 seconds for next 2 hours.
   - Hypotension was defined as SBP ≤20% of baseline value.
   - Tachycardia was defined as HR >25% of baseline value.
   - Bradycardia was defined as HR <45 beats/minute.

Incidences of all these parameters were recorded in all the three groups.

The side effects of the study drug like hypotension, bradycardia and sedation were noted. Hypotension was treated using 3 mg increments of IV mephentermine and fluids. Bradycardia was treated using 0.6 mg of IV atropine.

B. Extubation quality was rated using 5-point.[4]
   1. No coughing.
   2. Smooth extubation, minimal coughing.
   3. Moderate coughing (3 or 4 times).
   4. Severe coughing (5 to 10 times) and straining.
   5. Poor extubation, very uncomfortable (laryngospasm and coughing >10 times).

Number of coughs per patient was monitored for 900 seconds post extubation. Any laryngospasm, bronchospasm or desaturation was noted.

C. Time to extubation and time to eye opening were recorded.

D. Sedation was evaluated using Ramsay sedation scale.[4]
   1. Anxious, agitated, restless.
   2. Cooperative, oriented, tranquil.
   3. Responsive to verbal commands, drowsy.
   4. "Asleep", responsive to light stimulation.
   5. Asleep, slow response to stimulation.
   6. No response to stimulation.

Statistics- Statistical significance (P) for the results obtained from the above study were analysed using-

1. Descriptive statistics.
2. t-test = Independent samples.
3. t-test = Paired samples.
4. Repeated measure ANOVA.
5. Using SPSS for Windows (version 20.0).

RESULTS

		Group CX	Group DX	Group EX	Total
Age Group (in years)	18 to 20	3 (10)	1 (3)	2 (7)	6 (7)
	21 to 30	9 (30)	12 (40)	7 (23)	28 (30)
	31 to 40	11 (37)	9 (30)	5 (17)	25 (28)
	41 to 50	6 (20)	8 (27)	11 (36)	25 (28)
	51 to 60	1 (3)	0 (0)	5 (17)	6 (7)
Total		**30 (100)**	**30 (100)**	**30 (100)**	**90 (100)**
Mean Age in Years		**34.30 ± 9.24**	**33.87 ± 9.32**	**36.83 ± 9.51**	**35.24 ± 10.2**
P value		**0.1 (NS)**			

Table 1. Showing the Age Distribution

Figures in the parentheses indicate percentage; NS - Not significant.

Sex	Group CX	Group DX	Group EX	Total
	No. of Patients	No. of Patients	No. of Patients	
Male	15 (50)	14 (47)	13 (43)	42
Female	15 (50)	16 (53)	17 (57)	48
Total	**30 (100)**	**30 (100)**	**30 (100)**	**90 (100)**
p-value	**0.689 (NS)**			

Table 2. Showing the Sex Distribution between Three Groups

Figures in the parentheses indicate percentage; NS - Not significant.

Body Weight (kg)	Group CX	Group DX	Group EX
	No. of Patients	No. of Patients	No. of Patients
<40	1 (3)	1 (3)	0 (0)
41-50	9 (30)	7 (23)	8 (26)
51-60	16 (54)	13 (44)	11 (37)
61-70	4 (13)	8 (27)	8 (27)
71-80	0 (0)	1 (3)	3 (10)
Total	**30 (100)**	**30 (100)**	**30 (100)**
Mean body weight in kg ± SD	**53.80 ± 7.41**	**56.83 ± 8.25**	**58.03 ± 8.93**
p-value	**0.19 (NS)**		

Table 3. Showing the Body Weight Distribution

Figures in the parentheses indicate percentage; NS - Not significant.

	Duration of Surgery (minutes)
Group CX	68.33 ± 19.76
Group DX	70.12 ± 20.34
Group EX	67.33 ± 20.87
p-value	0.235 (NS)

Table 4. Showing the Mean Duration of Surgery

NS - Not significant.

	Group CX	Group DX	Group EX	P
Basal prior to infusion	84.93 ± 8.42	86.80 ± 13.10	87.63 ± 11.329	0.54
At 60 seconds	87.43 ± 8.30	86.97 ± 12.21	89.90 ± 11.22	0.61
At 180 seconds	99.77 ± 8.02	85.87 ± 11.80	95.30 ± 12.20	0.32
At 300 seconds	92.50 ± 10.67	81.97 ± 11.55	95.67 ± 10.56	0.05
At 420 seconds	95.63 ± 10.65	78.43 ± 10.86	94.61 ± 10.85	<0.001
At 600 seconds	96.83 ± 11.44	76.50 ± 11.55	96.61 ± 11.03	<0.001
At reversal	101.87 ± 9.70	78.67 ± 12.20	100.20 ± 12.63	<0.001
Drug 2	107.07 ± 10.22	81.63 ± 12.00	102.87 ± 11.96	<0.001
At extubation	112.47 ± 12.49	85.67 ± 12.55	96.83 ± 15.81	<0.001
Post extubation 60 seconds	110.77 ± 11.25	83.73 ± 12.46	94.87 ± 12.82	<0.001
Post extubation 180 seconds	103.63 ± 20.34	81.87 ± 12.28	90.73 ± 12.59	<0.001
Post extubation 300 seconds	103.70 ± 10.73	80.40 ± 13.47	84.77 ± 10.59	<0.001
Post extubation 420 seconds	100.77 ± 10.45	78.53 ± 13.37	81.30 ± 10.56	<0.001
Post extubation 600 seconds	96.00 ± 8.45	76.10 ± 13.72	82.10 ± 10.27	<0.001
Post extubation 900 seconds	92.07 ± 7.69	74.40 ± 13.32	84.03 ± 9.96	<0.001

Post extubation 1800 seconds	87.97 ± 8.41	73.87 ± 11.91	83.93 ± 8.95	0.001
Post extubation 3600 seconds	85.23 ± 7.95	75.97 ± 11.33	83.03 ± 8.36	0.016
Post extubation 5400 seconds	84.30 ± 8.86	77.87 ± 1.68	83.60 ± 7.76	0.4
Post extubation 7200 seconds	83.70 ± 8.98	80.70 ± 11.00	83.00 ± 6.72	0.56

Table 5. Showing the Intergroup Comparison of Mean Heart Rate (BPM) Changes between all the Groups

(p <0.01) - Highly significant (HS); (p <0.05) - Significant (S); (p >0.05) - Not significant.

	Group CX	**Group DX**	**Group EX**	**P**
Basal prior to infusion	96.96 ± 9.40	93.04 ± 7.92	91.56 ± 5.56	0.22
At 60 seconds	100.44 ± 8.49	93.26 ± 7.60	91.76 ± 5.23	0.06
At 180 seconds	104.83 ± 7.95	92.09 ± 7.64	92.33 ± 4.28	0.01
At 300 seconds	108.27 ± 9.81	90.94 ± 9.70	93.90 ± 3.68	<0.001
At 420 seconds	110.28 ± 8.97	88.94 ± 7.36	94.98 ± 3.91	<0.001
At 600 seconds	110.00 ± 14.63	86.61 ± 6.90	98.85 ± 6.30	<0.001
At reversal	114.81 ± 12.19	89.60 ± 6.67	108.77 ± 8.90	<0.001
Drug 2	116.55 ± 12.20	91.95 ± 7.26	103.17 ± 12.25	<0.001
At extubation	122.67 ± 12.04	95.77 ± 9.32	95.14 ± 10.03	<0.001
Post extubation 60 seconds	120.22 ± 10.10	93.91 ± 8.21	87.33 ± 11.29	<0.001
Post extubation 180 seconds	116.16 ± 8.865	91.79 ± 7.52	83.72 ± 7.57	<0.001
Post extubation 300 seconds	111.82 ± 8.49	89.75 ± 7.84	85.90 ± 8.20	<0.001
Post extubation 420 seconds	110.28 ± 7.25	87.86 ± 7.31	86.71 ± 7.95	<0.001
Post extubation 600 seconds	109.71 ± 7.06	86.21 ± 7.13	87.38 ± 7.84	<0.001
Post extubation 900 seconds	107.77 ± 7.50	83.94 ± 6.06	89.39 ± 9.05	<0.001
Post extubation 1800 seconds	101.35 ± 7.24	84.08 ± 5.78	89.66 ± 5.80	<0.001
Post extubation 3600 seconds	97.65 ± 7.45	87.68 ± 6.77	90.38 ± 4.73	<0.001
Post extubation 5400 Seconds	96.07 ± 6.23	90.54 ± 6.26	92.05 ± 3.82	<0.001
Post extubation 7200 Seconds	95.31 ± 6.56	92.52 ± 5.74	92.27 ± 3.69	0.001

Table 6. Showing the Intergroup Comparison of Mean Arterial Pressure (mmHg) Changes between all Three Groups

	Group CX	**Group DX**	**Group EX**	**P**
At extubation	1.59 ± 0.38	2.51 ± 0.53	1.45 ± 0.41	<0.001
Post extubation 300 seconds	1.97 ± 0.25	2.40 ± 0.32	1.78 ± 0.38	<0.001
Post extubation 600 seconds	1.90 ± 0.30	2.24 ± 0.38	1.90 ± 0.49	<0.001
Post extubation 900 seconds	2.01 ± 0.38	2.13 ± 0.19	1.96 ± 0.13	0.004
Post extubation 1800 seconds	2.02 ± 0.50	2.10 ± 0.20	2.01 ± 0.41	0.045
Post extubation 3600 seconds	2.00 ± 0.49	2.08 ± 0.41	2.00 ± 0.15	0.156
Post extubation 5400 seconds	2.00 ± 0.00	2.00 ± 0.00	2.00 ± 0.00	-
Post extubation 7200 seconds	2.00 ± 0.00	2.00 ± 0.00	2.00 ± 0.00	-

Table 7. Comparison of Ramsay Sedation Scale in Three Groups of Patients

	Group CX	**Group DX**	**Group EX**	**P**
Time to extubation	15.58 ± 3.23	17.24 ± 2.89	15.8 ± 3.66	<0.001
Time to eye opening	13.84 ± 3.67	16.15 ± 3.12	14.23 ± 2.95	<0.001
Extubation quality 5 pt. scale	1.57 ± 0.81	1.03 ± 0.20	1.60 ± 0.70	<0.001
No. of bouts of cough per patient	1.08 ± 0.50	0.3 ± 0.18	1.00 ± 0.30	0.004

Table 8. Comparison of Extubation Parameters among Three Groups of Patient Studied

	Group CX	**Group DX**	**Group EX**
Scale 1	18 (60)	27 (90)	20 (67)
Scale 2	6 (20)	3 (10)	5 (17)
Scale 3	4 (13)	0 (0)	4 (13)
Scale 4	2 (7)	0 (0)	1 (3)
Scale 5	0 (0)	0 (0)	0 (0)
Total	**30 (100)**	**30 (100)**	**30 (100)**
Inference	**Lower score of extubation quality is significantly associated with study group with p=0.001**		

Table 9. Comparison of Extubation Quality Occurred in Three Groups

DISCUSSION

A study title, "Effect of Dexmedetomidine with Esmolol on Extubation" was undertaken to compare the effects of intravenous dexmedetomidine (0.005 mg/kg) and esmolol (1.5 mg/kg) given before extubation on haemodynamic responses to extubation and extubation characteristics.

This study was conducted to compare the effectiveness of intravenous esmolol (1.5 mg/kg), a selective beta-adrenergic blocker with dexmedetomidine (0.005 mg/kg), an alpha-2 adrenergic receptor agonist in attenuation of haemodynamic stress response and airway reflexes to endotracheal extubation.

Esmolol hydrochloride is an ultra-short-acting, beta-one selective adrenergic receptor blocker with a distribution half-life of 120 seconds and an elimination half-life of 540 seconds. Esmolol appears quite suitable for use during a short-lived stress such as tracheal intubation and extubation.

Esmolol 1.0 mg/kg, 1.5 mg/kg and 2.0 mg/kg were used in patients before extubation in a study by Dyson et al,[5] which showed that the increase in systolic blood pressure could be prevented with 1.5 mg/kg and 2.0 mg/kg esmolol, but 1 mg/kg esmolol was found to be ineffective. Since, distinct hypotension was observed with 2.0 mg/kg esmolol, 1.5 mg/kg esmolol was reported as the optimal dose for the prevention of haemodynamic response due to tracheal extubation.

In our study, we used esmolol 1.5 mg/kg slow bolus 120 seconds prior to extubation, which was effective in blunting haemodynamic response with no side effects.

Fuhrman TM et al[6] (esmolol 0.5 mg/kg bolus followed by 0.3 mg/kg/min. infusion and alfentanil 5 mg/kg followed by saline infusion), Kovac et al[7] (nicardipine 0.03 mg/kg IV versus esmolol 1.5 mg/kg IV) and Bostana et al[8] (esmolol 1 mg/kg and lidocaine 1 mg/kg) all found esmolol was more effective than others in suppressing the response. Similar to our study here, all researchers have used ≥1 mg/kg esmolol in their studies, which have shown its efficiency over other drugs.

Dexmedetomidine is a highly selective α_2 adrenoreceptor agonist (α_1:α_2 - 1:1620). α_2 agonists decrease the sympathetic outflow and noradrenergic activity thereby counteracting haemodynamic fluctuations occurring at the time of extubation. The selectivity is dose dependant at low-to-medium doses and on slow infusion, high levels of alpha-2 selectivity is observed, while high doses or rapid infusions of low doses are associated with both alpha-1 and alpha-2 activities.

Different doses of dexmedetomidine have been used to attenuate the stress response to emergence from general anaesthesia. Guler et al[9] (0.5 µg/kg over 5 mins.), Aksu et al[10] (0.5 µg/kg over 10 mins.), Jain et al[11] (1 µg/kg over 10 mins.), Sriranga Rao et al[12] (0.5 µg/kg over 10 mins.), Kwon Hui Seo et al[13] (0.5 µg/kg, 0.7 µg/kg, 1 µg/kg), Bindu et al[14] (0.7 µg/kg over 10 mins.) have used various doses of dexmedetomidine.

Dose 0.5 µg/kg and above have been found to be effective in attenuating stress response to extubation. Kwon Hui Seo et al[13] conducted a study comparing the effectiveness of doses 0.5 µg/kg, 0.7 µg/kg, 1 µg/kg of dexmedetomidine and concluded that 0.5 µg/kg is effective in attenuating stress response and with minimal side effects.

Hence, we selected dose of 0.005 mg/kg dexmedetomidine, which is the dose effective with minimal side effects. We diluted the required dose of dexmedetomidine in 10 mL of normal saline and with the help of a syringe pump infused it intravenously over a period of 10 minutes. A brief increase in blood pressure and decrease in heart rate is noted initially whenever dexmedetomidine is administered as a single bolus dose. This early effect of dexmedetomidine can be attributed to its stimulation of peripheral alpha-2B receptors located in smooth muscles of blood vessels and this effect can be reduced by a slow infusion. Hence, we decided to administer this initial bolus dose of dexmedetomidine slowly over a period of 10 minutes intravenously.

From the pharmacokinetic profile, it is seen that the distribution half-life of intravenous dexmedetomidine is approximately 6 minutes. Jain et al,[11] Sriranga Rao et al,[12] and Bindu et al[14] have administered dexmedetomidine 10 minutes before extubation. Hence, in the present study, dexmedetomidine was administered 10 minutes before extubation to prevent stress response to extubation.

In our study, we observed that HR did not show a significant rise compared to basal value from second minute of drug administration, during reversal, at extubation and any period post extubation in dexmedetomidine group. But, in control group, there was a significant rise in HR compared to basal value. In esmolol group, there was no increase in heart rate during extubation compared to pre-esmolol value. Incidence of tachycardia was 74% in control group, 3% in dexmedetomidine group and esmolol group. The rise in HR in control group was more persistent than study group.

This observation is in concurrence with the study done by Jain D et al,[11] Sriranga Rao et al[12] where the pulse rate in dexmedetomidine group remained below the pre-DEX values (baseline value) at all-time intervals following extubation.

In our study, both dexmedetomidine and esmolol were equally effective in controlling heart rate response to extubation in contrary to Vanish Priya et al[15] who observed that dexmedetomidine to be effective than esmolol probably due to the lower esmolol dosage 0.5 mg/kg used in their study compared to 1.5 mg/kg used in ours.

Bradycardia was not observed in any of the patients. This finding is in concurrence with other studies, which did not observe statistically significant incidence of bradycardia.

SBP, DBP and MAP values were significantly lower in dexmedetomidine compared to baseline values at all times from the time of dexmedetomidine infusion to post extubation 30 minutes. This is in conjunction with the study conducted by Jain D et al[11] in which study group patients received 1 µg/kg of dexmedetomidine and they did not observe any significant change ($p<0.05$) in the blood pressure in dexmedetomidine group throughout the study period. Similarly, the SBP, DBP and MAP values in esmolol group remained below the pre-drug values. On the contrary,

systolic blood pressure rose significantly ($p<0.05$) in control group following extubation as observed in our study, which we achieved with 0.5 µg/kg of dexmedetomidine and 1.5 mg of esmolol.

In our study, none of the patients in dexmedetomidine group and esmolol group had hypertension as against 74% in control group.

This observation is in contradiction with the study done by Aksu R et al who observed significantly increased SBP at 1 and 5 minutes after extubation. Probably, this is due to infusion of dexmedetomidine over 5 minutes (Aksu et al).[10]

Sedation score was significant post extubation for 30 minutes in dexmedetomidine group compared with control group and esmolol group. After this period, sedation scores were comparable in all the three groups.

Agitation was observed in 9 patients in control group and 8 in esmolol group following extubation, whereas none were agitated in Group D. So, this finding concurs with the study done by Guler G et al[16] who conducted a study on the effect of single-dose dexmedetomidine in reducing the agitation and providing smooth extubation after paediatric adenotonsillectomy. Guler G et al[16] in their study on emergence agitation in children undergoing adenotonsillectomy observed that time to extubation and emergence were prolonged significantly when compared to control group with $p<0.05$ (5.03 ± 2.3 vs. 3.30 ± 1.3 minutes and 9.30 ± 2.9 vs. 7.20 ± 2.7 minutes, respectively). This observation is in agreement with our study conducted wherein time to extubation and eye opening (i.e., interval between cutoff of nitrous oxide to extubation and eye opening, respectively) were significantly prolonged in dexmedetomidine group when compared to control group and esmolol group (17.24 ± 2.89 vs. 15.58 ± 3.23, 15.8 ± 3.66 minutes and 16.15 ± 3.12 vs. 13.84 ± 3.67, 14.23 ± 2.95 minutes, respectively).

CONCLUSION

Inj. Dexmedetomidine 0.5 µg/kg bodyweight administered over 10 minutes and Inj. Esmolol 1.5 mg/kg bodyweight and administered over 1 minute before extubation attenuates haemodynamic responses to extubation, whereas dexmedetomidine also attenuates airway reflexes during emergence from general anaesthesia and facilitates smoother extubation without causing undue sedation.

Hence, dexmedetomidine is superior to esmolol in attenuating stress response to extubation without any adverse effects.

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