Original Article

Attenuation of Extubation Reflexes with Lignocaine and Propofol following Laparoscopic Cholecystectomy – A Quasi-experimental Study

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Abstract

Background: *The purposeful removal of the endotracheal tube (Tracheal extubation) from the trachea, can be associated with detrimental airway and haemodynamic responses like an increase in coughing, bronchospasm, laryngospasm, heart rate, blood pressure, intracranial pressure, intraocular pressure and so on. Different extubation techniques and medications have been attempted for attenuation of the airway and cardiovascular responses. Propofol and Lignocaine are widely available drugs in resource-limited settings and can be used to attenuate these responses and its complications. The objective of this study was to evaluate the effects of propofol and lignocaine in attenuating the extubation reflexes in patients undergoing laparoscopic cholecystectomy.*

Methods: *This quasi-experimental study was carried out between March 2021 and April 2022 at Dhaka Medical College and Hospital. All enrolled participants were randomly allocated into three groups: Normal saline (Group A), Lignocaine 1mg/kg (Group B) and Propofol 0.5mg/kg (Group C). These medications were administered 2 min before extubation. Airway responses like (coughing, bucking, and laryngospasm), respiratory rate, oxygen saturation, and haemodynamic parameters (HR, SBP, DBP, and MAP) were recorded at different time intervals.*

Results: *A total of 90 patients belonging to ASA I and II of either sexes (30 patients in each group) were included in this study. Demographic status and clinical characteristics of the patient were comparable among groups, with p-values > 0.05. After extubation, heart rate, systolic, diastolic, and mean arterial blood pressure were decreased significantly in propofol (Group C) and lignocaine (Group B) up to 15 min. A significant statistical difference was observed among the three groups in case of developing cough (p-values = 0.002). Group C (propofol) showed a significant result in comparison with group B (lignocaine) (p-value = 0.001). There was no statistically significant difference found in case of SpO_2 and respiratory rate among the groups and between the groups. (p-value > 0.05)*

Conclusions: *Propofol is more effective than lignocaine in attenuating extubation reflexes. Propofol also reduces the incidence of post extubation airway complications.*

Key Words: *Extubation reflexes, Lignocaine, Propofol, Laparoscopic cholecystectomy.*

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Introduction:

Tracheal extubation is a high-risk phase of anaesthesia. The majority of problems that occur during extubation and emergence are of a minor in nature, nut a small and significant number may result in injury or death.[1]

The problems associated with extubation may be broadly categorised into cardiovascular and respiratory complications. Respiratory complications include coughing, breath-holding, masseter-spasm, airway obstruction, laryngospasm, desaturation and aspiration. Cardiovascular complications include tachycardia and hypertensive episodes.[2] Although most patients can tolerate these transient effects without any significant consequences, but it is more hazardous in a patient with hypertension, myocardial insufficiency or cerebral vascular disease and is associated to increased incidence of cerebral haemorrhage, myocardial ischemia and pulmonary oedema.[3] Even these could be more detrimental in patients operated for cardiac, neurological or ophthalmic lesions.[4] Laparoscopic cholecystectomy is known as one of the most common laparoscopic surgeries worldwide. Carbon dioxide (CO_2) is used for pneumoperitoneum, which may result in the adverse cardiovascular effects. They mainly include an abrupt elevation of mean arterial pressure, systemic vascular resistance and decreased cardiac output because of the release of both catecholamines and vasopressin.[5]

Several techniques, as well as drugs, have been used to attenuate these responses during tracheal extubation. Techniques like extubation in a deeper plane of anaesthesia, substitution of the Endotracheal Tube with a laryngeal mask airway in deep plane and drugs like low dose propofol, â1 blockers like esmolol, landiolol, combined á â blocker like labetalol, Ca2+ channel blockers like diltiazem, verapamil, intravenous lignocaine, lignocaine spray, intracuff lignocaine, low dose intravenous opioids like fentanyl, remifentanil, alfentanil, sufentanil, central sympatholytics like clonidine, dexmedetomidine, vasodilators like nitrates, prostaglandins and MgSO4 have been studied as sole agent or in combination to control haemodynamic changes and upper airway tract events with different success.[4,6]

Dexmedetomidine and Fentanyl are associated with bradycardia, emesis and shivering.[7] Alkaya et al. (2014)[8] found that esmolol infusion before extubation can prevent hypertension and tachycardia caused by extubation in patients undergoing elective craniotomy. In another study, larger dose of esmolol of 2mg/kg significantly decreases in systolic blood pressure[9] and it is found that extubation time is prolonged in the patients taking alfentanyl.[10] Clonidine causes bradycardia in significant number of people undergoing extubation.[11] Magnesium sulfate can reduce blood pressure, but with the increase in extubation time for laparoscopic cholecystectomy.[5] Thus each of them has their own merits and demerits respectively.

The use of propofol is safe and effective, and there are no significant adverse reactions during anaesthesia and extubation.[12] Propofol is known as a potent inhibitor of airway reflexes in hypnotic concentration and even subhypnotic doses prevent laryngospasm on extubation in children[13]. Subhypnotic doses of propofol (0.25mg/kg) have been used for the treatment of postextubation laryngospasm and have proven effective.[14] Propofol in a small dose (0.8 mg/kg) was a useful drug to relieve laryngospasm in most children following the removal of the LMA.[15] Intavenous propofol 0.5mg/kg attenuates haemodynamic responses to extubation immediately and satisfactorily.[16]

On the other hand, Lignocaine, an amide local anesthetic agent can decrease heart rate, blood pressure and cough reflex induced during endotracheal extubation by its mechanisms of direct myocardial depressant effect, peripheral vasodilator effect, interruption of cholinergic synaptic transmission, and suppression of the cough reflex.[17]

A number of studies have evaluated the efficacy of both the drugs, either independently or in comparison to other drugs. But there is limited studies comparing between lignocaine and propofol to attenuate extubation reflexes during emergence in surgical patients. This study has planned to compare the effects of lignocaine and propofol to extubation reflexes following laparoscopic cholecystectomy.

Methods:

This quasi-experimental study was conducted in the Department of Anaesthesia, Pain, Palliative & Intensive Care Medicine, Dhaka Medical College Hospital, Dhaka, from March 2021 to April 2022. The adult patient with ASA I or II and Mallampati score I or II who required elective laparoscopic cholecystectomy under general anaesthesia was included in the study population. Patients with history of allergy to any of the study drugs, patients with arrhythmia, heart failure, ischemic heart disease, heart block and taking antiarrhythmic or steroid therapy, patients with impaired liver function, renal function, dementia or psychiatric disorder, bronchial asthma, chronic obstructive pulmonary disease, and BMI >40 kg/m^2 were excluded from this study. Patients were allocated into Group A, Group B, and Group C. Each group received the following drugs 2 minutes before extubation: Group A (control) received 10 ml 0.9% saline, Group B received intravenous Lignocaine 1 mg/kg diluted in 10 ml and Group C received intravenous Propofol 0.5 mg/kg diluted in 10 ml.

Study procedure:

With approval of the Ethical Review Committee of Dhaka Medical College (ERC-DMC/ECC/2021/280), this quasi-experimental study was carried out in 90 adult patients belonging to ASA I or II scheduled for elective laparoscopic cholecystectomy surgery under general anaesthesia with Mallampati class I and II.

During pre-anesthetic visit, the patients were selected on the basis of inclusion & exclusion criteria, explained about the study purpose, advantages and risks of procedure and informed written consent was obtained. History taking focusing clinical features, disease duration along with physical examination was done as per standard protocol. Patients were kept nil per mouth at least for six hours before surgery and premedicated with Tab. Midazolam (7.5mg) orally at bed time day before surgery.

On arrival to the operating room, an 18 gauge IV cannula was inserted in a peripheral vein in non-dominant forearm. Multi-parameter monitor was attached. Electrocardiography (ECG), peripheral oxygen saturation (SPO2), systolic (SBP), diastolic (DBP) and mean (MAP) arterial pressure monitoring were recorded as baseline values and noted for each patient. For induction, 2 ìg kg”1 fentanyl and 5mg kg”1 thiopental sodium were used. 1.5mg kg”1 suxamethonium was used for muscle relaxation to facilitate intubation. Two minutes after induction agents, all the patients were intubated by the oral route. Isoflurane at 0.6-0.8% end-tidal concentration in 50% O2/N2O was used for anaesthesia maintenance and vecuronium incremental was used for maintaining muscle relaxation. The concentration of isoflurane was increased or decreased during surgery to maintain BP and HR between 80% and 120% of the baseline values. When the per operative SBP exceeded 20% of the baseline value, the dose of isoflurane increased up to maximum of 1.2% end-tidal concentration and if an adequate decrease cannot be obtained, then 50-100 ìg nitroglycerin was administered. Hypotension (a decrease in SBP >20% from baseline or an SBP <90 mm Hg) was controlled by increasing the fluid infusion rate and decreasing isoflurane concentrations by 0.2% intervals down to a minimum 0.4%. If the MAP lower than 60 mmHg, 5 mg inj. ephedrine was given. If the HR will lower than 50 beats min”1 then 0.5 mg atropine was given.

The vecuronium incremental injection was stopped approximately 30 min before the end of the operation. Isoflurane concentration was reduced by 50% when there will 5 min left to the end of the procedure. At the very last suture of the surgery, the isoflurane and N2O were stopped completely. Patients were planned for extubation by clinical judgement (when patient was awake, obeyed command and head raised for at least 5 seconds) as our institution had no facility for neuromuscular and depth of anaesthesia monitoring.

In Group A, 10 ml 0.9% saline was given intravenously over 60s; in Group B, 1mg/kg lignocaine diluted in 10 ml was given intravenously over 60s; in Group-C received injection propofol 0.5 mg/kg diluted in 10 ml was given intravenously over 60s before 2 min of extubation. One min after administering the drugs respective of the groups, the endotracheal secretion was aspirated, reversal drugs were given and then extubated.

The patients were given 100% O2 inhalation through masks for 10 minutes following extubation. SBP, DBP, MAP, HR, SPO2 and RR were recorded just before anaesthesia as baseline, 1 min before extubation and at 1, 3, 5, 10 and 15 min after extubation. Numbers of the patients developed the airway reflex (cough, bucking and laryngospasm) during this extubational and recovery period were recorded.

Statistical analysis:

Every patient's data was collected and recorded on a separate data sheet. Data analysis was performed by mean ± standard deviation (±SD), or frequencies (number of cases) and percentages when appropriate. Comparison of numerical variables between the study groups was performed using student's t- test for independent samples. For comparing categorical data, Chi-square (X 2) was performed. Inter group analysis was done by ANOVA. p <0.05 was considered statistically significant. All statistical calculations was done using computer programs SPSS (Statistical Package for the Social Science; SPSS Inc.,Chicago, IL, USA) version 26 for Microsoft Windows.

Results

This quasi-experimental study was carried out during 1st March 2021 to 30 April 2022 in the tertiary-level hospital (DMCH) in Dhaka city. A total of 90 patients were enrolled in this study by inclusion and exclusion criteria & they were randomly divided into three groups (group A, B and C); 30 patients in each group and no patient was excluded. Data like demographic variables (Age, height, weight, BMI, ASA status I or II, Mallampati score I or II) and Outcome variables (Coughing, Bucking, Laryngospasm, SpO2, RR, HR, SBP, DBP, MAP) were collected from the patient data collection form. All data were expressed as tables and charts.

There was no statistically significant difference found in case of demographic variables and clinical status. (Table I)

Considering airway reflexes, there were significant statistical difference observed among three groups in case of developing cough (p values was 0.002). Group C showed significant result in comparison with group B (p values was 0.001). In case of bucking the ETT & laryngospasm, no statistical differences were observed. Table II demonstrates the airway reflexes during extubation.

Table I: Distribution of the patients by demographic variables and clinical status (n=90)

Characteristics	Group A (n=30)	Group B (n=30)	Group C (n=30)	P value
Age in years	40.75±9.67	42.65±14.73	41.05±11.19	0.867
Sex				
Male	15(50%)	13(43.3%)	12(40%)	0.730
Female	15(50%)	17(56.7%)	18(60%)	
Height	151.50±39.1	165.85±4.47	164.50±5.59	0.102
Weight	77.50±30.05	71.35±10.5	73.60±6.15	0.579
BMI	25.4±1.77	25.89±3.39	26.88±3.06	0.230
Co-existing disease				
DM	4(13.3%)	0(00)	2(6.7%)	0.294
HTN	8(26.7%)	10(33.3%)	7(23.3%)	
HTN+DM	3(10%)	2(6.7%)	6(20%)	
ASA				
I	17(56.7%)	16(53.3%)	11(36.7%)	0.128
II	13(43.3%)	14(46.7%)	19(63.3%)	
Mallampati score				
Class I	17(56.7%)	20(66.7%)	12(40%)	0.111
Class II	13(43.3%)	10(33.3%)	18(60%)	

A= Control Group, B= Lignocaine Group, C= Propofol Group, n= number of patients. Data were presented as mean±SD and percentage. P value reached from chi square test and student's t test.

Table II: Distribution of patients by airway reflexes and comparison among three groups (n=90)

Variables	Group A	Group B	Group C	P value	Gr A vs B	Gr A vs C	Gr B vs C
Develop cough	14(46.7%)	7(23.3%)	2(6.7%)	0.002[s]	0.013[s]	0.001[s]	0.001[s]
Bucking the ETT	10(33.3%)	11(36.7%)	7(23.3%)	0.510	0.236	0.569	0.394
Develop laryngospasm	2(6.7%)	0(00)	0(00)	0.354	0.297	0.278	-

Data were expressed as percentages. p <0.05 statistically significant, s= statistically significant. ANOVA was performed among three groups.

Table III: Comparison of SpO_2 of the study subject among three groups (n=90)

					Pairwise significance		
SPO_2	Group A	Group B	Group C	P value	Gr A vs B	Gr A vs C	Gr B vs C
Baseline	98.55±1.35	98.10±2.73	97.40±3.42	0.390	0.513	0.171	0.479
Before drug injection	99.90±0.44	100.00±0.00	99.95±0.22	0.552	0.324	0.657	0.324
1 minute before extubation	100.00±0.00	100.00±0.00	100.00±0.00	-	-	-	-
1 minute after extubation	99.70±0.80	100.00±0.00	100.00±0.00	0.069	0.178	0.102	-
3 minutes after extubation	98.65±4.40	100.00±0.00	100.00±0.00	0.162	0.186	0.178	-
5 minutes after extubation	98.65±4.81	100.00±0.00	100.00±0.00	0.216	0.225	0.218	-
10 minutes after extubation	99.90±0.44	99.90±0.44	100.00±0.00	0.609	0.100	0.324	0.324
15 minutes after extubation	99.95±0.22	99.95±0.22	100.00±0.00	0.609	0.100	0.330	0.324

Values are expressed as Mean±SD. ANOVA was performed among three groups.

There was no statistically significant difference found in case of SpO_2 among the groups and between the groups.

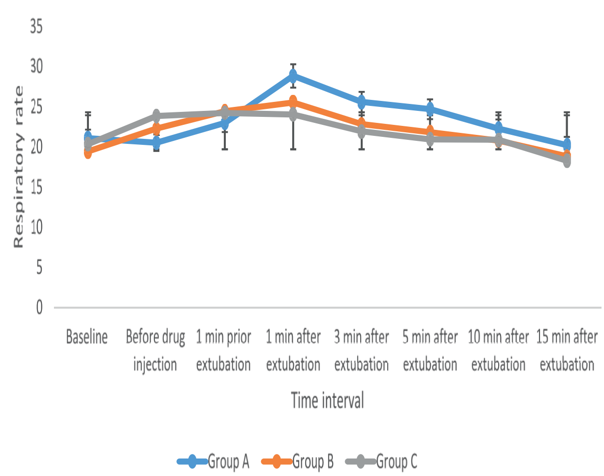

Figure 1: Changes of respiratory rate of the study participants

There was no statistically significant difference found in case of respiratory rate among the groups and between the groups.(Figure 1)

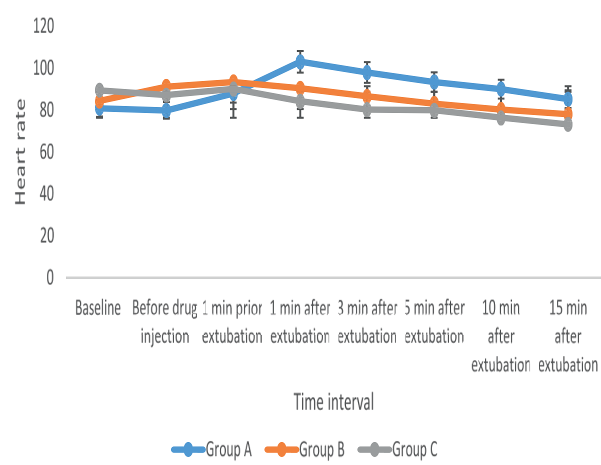

Figure 2: Changes of heart rate of the study participants

Considering heart rate, there were significant statistical difference observed among three groups (p values was 0.001) upto 15 minutes of postextubation period. Group C showed significant result in comparison with group B upto 10 minutes of postextubation period. (Figure 2)

Table IV: Comparison of Systolic blood pressure of the study subject among three groups (n=90)

Systolic	Group A	Group B	Group C	P value	Pairwise significance		
					Gr A vs B	Gr A vs C	Gr B vs C
Baseline	124.70±9.84	123.25±16.11	130.50±13.36	0.201	0.733	0.126	0.130
Before drug injection	123.95±15.52	127.80±21.60	127.60±13.84	0.430	0.495	0.375	0.972
1 minute before extubation	138.10±10.62	128.35±18.95	124.15±10.24	0.308	0.034^{s}	0.010^{s}	0.024^{s}
1 minute after extubation	140.40±11.64	131.30±19.02	122.25±8.65	0.001^{s}	0.041^{s}	0.001^{s}	0.003^{s}
3 minutes after extubation	134.10±12.99	128.50±19.72	118.90±9.95	0.007^{s}	0.002^{s}	0.001^{s}	0.031^{s}
5 minutes after extubation	132.05±12.22	125.45±17.64	117.90±10.52	0.008^{s}	0.012^{s}	0.001^{s}	0.029^{s}
10 minutes after extubation	130.05±12.22	125.45±17.64	117.90±10.52	0.008^{s}	0.031^{s}	0.002^{s}	0.004^{s}
15 minutes after extubation	126.05±13.85	121.40±17.61	113.10±12.80	0.001^{s}	0.017^{s}	0.004^{s}	0.361

Values are expressed as Mean±SD, p <0.05 statistically significant, s= statistically significant. ANOVA was performed among three groups.

Considering SBP, there were significant statistical difference observed among three groups upto 15 minutes of postextubation period. Group C showed significant result in comparison with group B upto 10 minutes of postextubation period.

Table V: Comparison of Diastolic blood pressure of the study subject among three groups (n=90)

					pairwise significance		
Diastolic	Group A	Group B	Group C	P value	Gr A vs B	Gr A vs C	Gr B vs C
Baseline	76.50±5.36	80.00±9.30	87.15±9.72	0.001^{s}	0.153	0.001^{s}	0.023^{s}
Before drug injection	83.75±3.80	83.30±6.64	87.60±11.32	0.176	0.794	0.158	0.151
1 minute before extubation	88.50±1.19	85.90±6.8	83.95±6.21	0.230	0.377	0.022^{s}	0.140
1 minute after extubation	88.80±5.61	83.10±19.52	78.65±5.89	0.005^{s}	0.024^{s}	0.001^{s}	0.027^{s}
3 minutes after extubation	88.80±5.61	82.05±6.26	77.40±5.55	0.001^{s}	0.044^{s}	0.001^{s}	0.018^{s}
5 minutes after extubation	82.5±5.39	76.95±6.98	71.35±7.08	0.001^{s}	0.013^{s}	0.001^{s}	0.045^{s}
10 minutes after extubation	80.35±5.39	73.95±6.98	70.35±7.08	0.001^{s}	0.025^{s}	0.001^{s}	0.033^{s}
15 minutes after extubation	79.70±6.20	75.05±6.81	72.30±7.88	0.006^{s}	0.030^{s}	0.002^{s}	0.246

Values are expressed as Mean±SD, p <0.05 statistically significant, s= statistically significant. ANOVA was performed among three groups.

Considering DBP, there were significant statistical difference observed among three groups upto 15 minutes of postextubation period. Group C showed significant result in comparison with group B upto 10 minutes of postextubation period.

Table VI: Comparison of MAP of the study subject among three groups (n=90)

MAP	Group A	Group B	Group C	P value	pairwise significance Gr A vs B	Gr A vs C	Gr B vs C
Baseline	91.60±5.79	92.25±11.28	98.37±9.38	0.063	0.820	0.012[s]	0.090
Before drug injection	96.10±5.25	96.85±10.40	100.21±11.49	0.358	0.775	0.018[s]	0.344
1 minute before extubation	100.50±5.87	102.25±12.31	96.84±7.04	0.164	0.569	0.167	0.103
1 minute after extubation	104.90±7.05	97.55±11.14	93.68±5.34	0.001[s]	0.017[s]	0.001[s]	0.017[s]
3 minutes after extubation	101.85±7.88	94.00±14.26	90.10±6.16	0.002[s]	0.028[s]	0.001[s]	0.032[s]
5 minutes after extubation	98.60±7.02	89.75±14.43	85.47±12.24	0.050	0.039[s]	0.015[s]	0.021[s]
10 minutes after extubation	96.90±7.90	88.475±9.37	84.18±8.47	0.001[s]	0.048[s]	0.001[s]	0.038[s]
15 minutes after extubation	94.35±8.12	86.35±9.38	84.57±8.69	0.004[s]	0.020[s]	0.001[s]	0.109

Values are expressed as Mean±SD, p <0.05 statistically significant, s= statistically significant. ANOVA was performed among three groups.

Considering MAP, there were significant statistical difference observed among three groups upto 15 minutes of postextubation period. Group C showed significant result in comparison with group B upto 10 minutes of postextubation period.

Discussion

Endotracheal extubation is an unpredictable and difficult part of anaesthetic management. Elevation of blood pressure, heart rate, incidence of coughing, breath-holding, laryngospasm, airway obstruction and aspiration during extubation are brief but may have detrimental effects. Both lignocaine and propofol attenuate the hemodynamic response to tracheal extubation by its direct myocardial depressant effect and peripheral vasodilatory effect, and their suppressive effect of haemodynamic and airway instability is due to the effect on synaptic transmission. There is limited research comparing the effectiveness of both drugs in attenuating extubation reflexes. This study compared the effects of lignocaine and propofol in attenuating extubation reflexes following laparoscopic cholecystectomy.

In our study, the demographic and clinical characteristics (age, sex, marital status, weight, height, Mallampati, ASA score) were comparable among the three groups (p> 0.05).

In this study, post extubation cough reflexes were significantly reduced in propofol compared to lignocaine and control group. Jung, Park and Kim (2014)[18] demonstrated that sub-hypnotic dose (0.3 mg/kg) of propofol decreased the incidence and severity of coughing effectively; which also supports our study result. These findings of our study also correlated with the study by Cheng et al. (2011)[12], who concluded that incidence of cough in post extubation period was significantly lower in propofol (0.5mg/kg) group when compared to urapidil group. Yang et al. (2019)[19] concluded that the preoperative and intraoperative administration of intravenous lignocaine decreased the incidence of cough after extubation. Cliviuo et al. (2018)[20] also showed that within a range of 0.5–2 mg/kg, intravenous lignocaine dose dependently prevents intubation, extubation and opioid-induced cough in adults.

Though there were some supporting evidences that intravenous lignocaine may decrease post extubation cough reflexes, however Jee and Park (2003)[21] observed no difference in incidences of coughing after administration of intravenous lignocaine (1 mg/kg) 3mins before extubation. This discrepancy could be due to variation in time, types of surgery and dosage of drug.

There were no significant differences in post-extubation SpO2 and respiratory rate between the groups, which is consistent with the study conducted by Swamy et al. (2018). In this study, there were statistically significant differences in hemodynamics (HR, SBP, DBP, MAP) between the groups ($p < 0.05$).

Heart rate was lower in propofol and lignocaine groups at 1, 3, 5, 10 & 15 minutes after extubation when compared to the control group ($p< 0.05$). Heart rate in propofol group was significantly lower than lignocaine group upto 10 minutes following extubation. In line with our study, Cheng et al. (2011)[12] demonstrated that a reduction in heart rate after extubation for upto 10 minute in patients who received intravenous propofol (0.5 mg/kg). Nagrale, Indurkar & Pardhi (2016)[16] compared the haemodynamic effects of intravenous Propofol 0.5mg/kg, Lignocaine 1mg/kg and Esmolol 1.5mg/kg given two minutes prior to extubation in the patients scheduled for major surgeries. In their study, heart rate decreased ($p<0.05$) immediately in group E (Esmolol) and group P (Propofol) after study drug was given and remained stable at that level upto 10 mins after extubation. It increased significantly in Lignocaine group upto three minutes after extubation and decreased at 5 and 10 minutes after extubation. Another study by Sirajuddin et al. (2021)[22] concluded that hemodynamic values like heart rate was significantly less in Propofol group compared to Lignocaine group in post extubation period. These findings are in agreement with the current study.

In contradiction to our results, Sanikop and Bhatt (2010)[23] showed reduced heart rate after extubation for up to 10 min in patients who received intravenous lignocaine (1.5 mg/kg) when compared with patients who received placebo. Jung, Park and Kim (2014)[18] concluded that patients who received propofol 0.3 mg/kg did not experience a reduction in HR up to 10 min after extubation when compared to their controls ($p >0.05$), The contradiction might be due to dosage difference of study drugs.

Blood pressure measurements (SBP, DBP, and MAP) were lower in propofol (0.5 mg/kg) and lignocaine (1 mg/kg) groups at 1, 3, 5, 10 and 15 minutes after extubation when compared to control group. SBP, DBP and MAP in propofol group were significantly lower than lignocaine group upto 10 minutes following extubation. In line with our study Kumar & Laxminarsaiah (2018)[3] demonstrated that patients who received 0.5 mg/kg of propofol and 1.5 mg/kg of esmolol showed a significant decrease in systolic blood pressure post-extubation upto 10 min in both groups. Moein Vaziri et al. (2013)[24] concluded that propofol 0.5mg/kg given 2 minutes prior extubation reduced SBP, DBP, MAP, HR and cough production upto 5 minutes after extubation compared with placebo group. Savitha and Joylin (2014)[25] showed that fall in HR, SBP, DBP and MAP was statistically significant upto 5 minutes who received intravenous lignocaine 1mg/kg given 2 minutes prior to extubation.

Contrary to our finding, Jung, Park and Kim (2014)[18] showed that HR and MAP increased from discontinuation of anaesthetic drugs to 10 minutes in PACU compared to before induction in both propofol (0.3mg/kg) and placebo group. Sanikop and Bhat (2010)[23] showed significant differences on SBP and DBP after extubation for upto 10 min in patients who received intravenous lignocaine (1.5 mg/kg) when compared to plaebo group. Nagrale, Indurkar & Pardhi (2016)[16] showed that IV lignocaine 1mg/kg given 2 minutes prior to extubation was not effective immediately and attenuation of haemodynamic responses to extubation occurred after 5 minutes postextubation period.

Conclusion

Intravenous propofol is more effective than lignocaine in attenuating extubation reflexes especially incidence of cough, heart rate, systolic, diastolic and mean arterial pressure in patients undergoing laparoscopic cholecystectomy.

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