Original Article

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Study of Effect of Melatonin Premedication on Attenuation of Hemodynamic Response to Laryngoscopy and Intubation

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Abstract

Background and Aim: Laryngoscopy and endotracheal intubation cause increase in heart rate and blood pressure as well as abnormalities of cardiac rhythm due to reflex sympathetic discharge which is caused by epipharyngealand laryngo-pharyngeal stimulation. The aim is to study the changes in following parameters during laryngoscopyand endotracheal intubation up to 10 min with tab melatonin administration.

Material and Methods: The present study was carried out in the Department of Anaesthesiology, Government Medical College and S.S.G. Hospital, Vadodara, from November 2017 to October 2018. Randomisation was done according to computer generated list into two equal groups. Group C (Control group) - Patients received two tablets of vitamin D3 (placebo) 120 min before induction of anaesthesia.. Group M (Melatonin group) received oral melatonin tablets of 6mg (two tablets of 3mg each) 120 min before induction of anaesthesia. Vitamin D3 was used as placebo drug. Haemodynamic parameters such as heart rate: systolic, diastolic and mean blood pressures were recorded before the administration of drug (baseline), 120 min after administration of study drug, immediately after induction, at laryngoscopy and intubation, just after laryngoscopy and intubation and at 1, 3, 5 and 10 min thereafter.

Results: The mean pre operative pulse rate, the Systolic blood pressure(SBP), the Diastolic blood pressure(DBP), Mean arterial pressure(MAP) and the SpO2 were comparable in both groups but not significant statistically ($p>0.05$). At baseline and just before intubation, pulse rate was comparable in both groups. Nausea & vomiting was seen in one patient from study group & was treated with inj.Ondansetroniv. Hypotension was observed in 1 patient from the study group.

Conclusion: Administration of oral melatonin premedication 120 minutes before surgery results in Significant attenuation of the rise in systolic, diastolic and mean arterial blood pressure at the time of laryngoscopy & intubation and Transient increase in pulse rate which settled down within 1 minute after intubation and remained stable throughout the study period.

Keywords: Arterial blood pressure; Intubation; Laryngoscopy; Melatonin; Pulse rate

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Introduction

General anaesthesia is still one of the most common modes of anaesthesia for a variety of surgeries. It involves laryngoscopy and intubation as an integral and essential part. Laryngoscopy and endotracheal intubation cause increase in heart rate and blood pressure as well as abnormalities of cardiac rhythm due to reflex sympathetic discharge which is caused by epipharyngealand laryngo-pharyngeal stimulation. While the afferent limb of the reflex arc is via cranial nerves of the upper airway, the efferent limb is via sympathetic nerves.

Laryngoscopy and endotracheal intubation are considered potent noxious stimuli which provoke haemodynamic responses leading to a marked increase in heart rate and blood pressure.[1] This is probably of no consequence in healthy individuals. However, these events are especially detrimental in individuals who have limited myocardial reserve due to coronary artery disease, cardiac dysrhythmias, congestive heart failure, hypertension, cardiomyopathy and geriatric age group.[2] During intubation of trachea, the laryngeal and tracheal sensory receptors are stimulated which result in the release of endogenous catecholamines resulting in tachycardia and hypertension.[3] Stress response increases both SABP and DABP measurements increase by 36-40% in contrast to control levels. Heart rate levels increase more than 20% with tracheal intubation in contrast to laryngoscopy.[4,5] The pressor (stress) response reaches a peak 1-2min after laryngoscopy and tracheal intubation, and usually subsides within 5-6min, although tachycardia may persist for 10min.[6,7]

The hemodynamic response results in hypertension, tachycardia, and dysrhythmias, secondary to increase in circulating catecholamines. This sympathoadrenal response is usually transient, variable and unpredictable. It reaches a peak level within one minute and ends in 5-10 minutes after intubation. The pressor response is well tolerated by overall healthy patients, i.e. ASA I and II patients. However, it could be dangerous or even life threatening and therefore undesirable in susceptible patients(ASA III and IV); i.e. in those with systemic hypertension, coronary artery disease, intra cranial aneurysm, where circulation is already jeopardised.

The sympatho adrenal response increases the workload of myocardium which can lead to potentially deleterious effects like ventricular failure, myocardial infarction, pulmonary oedema, ventricular arrhythmias, cerebral haemorrhage, and rupture of cerebral aneurysm. Convulsion may be precipitated in a pre-eclamptic patient. Thus there is a need to suppress the hemodynamic response to laryngoscopy and intubation.

Since the invention of laryngoscopy and endotracheal intubation, various drug regimens and techniques have been used from time to time to attenuate these stress responses. Some of such agents being opioids (fentanyl, alfentanil), calcium channel blockers (verapamil, diltiazem), sympatholytics (clonidine, dexmedetomidine and methyldopa), beta blockers (esmolol, propranolol), benzodiazepines (midazolam, alprazolam), barbiturates, propofol, pregabalin and peripheral vasodilators (sodium nitroprusside, nitroglycerine).[8] However, each agent has some limitations such as respiratory depression, hypotension, tachycardia, bradycardia, rebound hypertension or allergic reactions. Hence, there has always been a need for a better agent. Melatonin (N acetyl 5 methoxytryptamine) is an endogenous sleep regulating hormone secreted by pineal gland. Exogenous administration of melatonin facilitates sleep onset and improves the quality of sleep. It is different from benzodiazepines and their derivatives in that it produces natural sleep pattern and does not lead to impairment of cognitive functions.[9] Various researchers have used this drug in different dose patterns as premedication in both adults as well as children. It has been mainly studied in view of pre operative anxiolysis, sedation in Intensive Care Unit, pre operative cognitive and psychomotor functions.[10] Moreover, administration of 1 mg of melatonin during the daytime to healthy young women decreased systolic, diastolic and mean arterial pressure along with the reduction of norepinephrine concentration the same depressant effect on BP and noradrenergic activation was observed in healthy men treated with melatonin.[11,12]

There are lots of studies regarding the sedative and anxiolytic effect of melation. But its use in attenuating pressor response to laryngoscopy and intubation has not been explored much. Hence study has been carried out to understand efficacy of oral melatonin in attenuation of hemodynamic response to laryngoscopy and intubation. The aim is to study the changes in following parameters during laryngoscopyand endotracheal intubation up to 10 min with tab melatonin administration.

Material and Methods

The present study was carried out in the Department

of Anaesthesiology, Government Medical College and S.S.G. Hospital, Vadodara, from November 2017 to October 2018. It was a prospective randomized controlled study of total 80 patients, approved by the Hospital Ethics Committee.

Inclusion criteria were: Patients belonging to American society of anesthesiologist (ASA) by physical status grade I and II, age 20-45 years of either gender, patients posted for planned surgery requiring general anaesthesia and endotracheal intubation

Exclusion criteria were diabetes, hypertension, psychiatric illness, intake of antipsychotics, sedatives, anxiolytics and antiepileptic drugs; sleep disorders, obesity and drug allergy. Likewise, patients with anticipated difficult intubation and those requiring more than one attempt or more than 20 s for laryngoscopy were excluded from the study.

Randomisation was done according to computer generated list into two equal groups. Group C (Control group) - Patients received two tablets of vitamin D3(placebo) 120 min before induction of anaesthesia.. Group M (Melatonin group) received oral melatonin tablets of 6mg (two tablets of 3mg each) 120 min before induction of anaesthesia. Each patient received either drug based on the generated list in a thick opaque, similar looking envelope by the pre-operative nurse. Both patient and investigator were unaware of the type of drug. Vitamin D3 was used as placebo drug.

In the pre-operative room, the study drugs were administered with a sip of water 120 min before surgery. Continuous monitoring of the pulse rate, respiratory rate, blood pressure and arterial oxygen saturation (SpO2) was done in the pre-operative period at an interval of 5 min by the nurse posted in the pre operative room.

On receiving the patient in the operation theatre, routine monitoring was commenced which included heart rate, electrocardiogram, arterial SpO2, non-invasive blood pressure (NIBP) and end-tidal carbon dioxide (EtCO2). All the patients were administered 100% oxygen for 3 min before induction. Glycopyrrolate 0.004 mg/kg and fentanyl 1 µg/kg were administered intravenously. Induction was attained with intravenous propofol 2 mg/ kg intravenously mixed with preservative-free lignocaine hydrochloride. Succinylcholine was given intravenously 2 mg/kg to facilitate endotracheal intubation with proper sized cuffed endotracheal tube by the same person each time. Maintenance of anaesthesia was attained with inhalation of sevoflurane 1 minimum alveolar concentration; nitrous oxide: oxygen 50:50. Muscle relaxation was attained with vecuronium bromide administered in the dose of 0.06–0.08 mg/kg

Intravenously as loading dose and one-fourth of the initial dose as maintenance doses. Mechanical ventilation was adjusted to maintain normocapnia (EtCO2 values of 35–38 mmHg). Intravenous infusion of injection diclofenac sodium 75 mg was administered slowly 15 min before completion of surgery for post-operative analgesia. After completion of the surgery, neostigmine 50 µg/ kg and injection glycopyrrolate 10 µg/kg were administered intravenously to reverse the residual neuromuscular blockade.

Haemodynamic parameters such as heart rate: systolic, diastolic and mean blood pressures were recorded before the administration of drug (baseline), 120 min after administration of study drug (just before induction), immediately after induction, at laryngoscopy and intubation, just after laryngoscopy and intubation and at[1,3,5] and 10 min thereafter. In the post-anaesthesia care unit, the patients received the standard post-operative care including oxygen administration via face mask at[4–6] L/min and monitoring of heart rate, NIBP, respiratory rate and SpO2. We observed for any episodes of nausea, vomiting, dizziness, headache, respiratory depression, arrhythmias, bradycardia, hypotension and restlessness till 24 h postoperatively. Complication like nausea/ vomiting, tachycardia, hypertension, hypotension, arrhythmia, drowsiness, restlessness, headache should be watched for preoperative intraoperative and postoperative period for 24 hours.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2007) and then exported to data editor page of SPSS version 15 (SPSS Inc., Chicago, Illinois, USA). For all tests, confidence level and level of significance were set at 95% and 5% respectively.

Results

The mean age, mean weight, ASA physical status and the ratio of Males to Females among patients in control group and in study group were comparable and not significant between both groups. ($p>0.05$) (Table 1)

The mean pre operative pulse rate, the

Table 1: Mean Age, Weight, ASA Grading and Duration of Surgery.

	Control Group(C)	Study Group(M)	p value
Age (years)	33.35 ± 2.98	32.20 ± 3.21	p = 0.1008
Mean ± SD			p >0.05
Weight (kg)	56.20± 4.57	55.32 ± 3.87	p = 0.19
Mean ± SD			p>0.05
ASA Grade	30/10	28/12	p = 0.082
I/II			p > 0.05
Gender	21:19	20:20	p = 0.139
Male:Female			p > 0.05

Table 2: Changes in mean pulse rate.

Time	Control group		Study Group		Inter Group
	Pulse rate	Intra group p value	Pulse rate	Intra group p value	p value
Baseline	77.10±6.42	N A	79.4±6.72	N A	p=0.305 p> 0.05
120 minutes after study drug	78.57±6.32	P=0.305 p > 0.05	78±6.82	p =0.357 p > 0.05	p =0.699 p> 0.05
Just after induction	76.22±6.43	P=0.542 p > 0.05	76.20±6.65	p =0.03 p< 0.05	p =0.989 p> 0.05
At laryngoscopy &intubation	82.52±6.45	P=0.0003 P<0.01	79.47±6.49	p =0.96 p> 0.05	p=0.037 p< 0.05
After 1 minute of intubation	83.97±6.4	p<0.0001	74.9±6.04	p =0.003 p< 0.05	p<0.0001
After 2 minutes of intubation	83.7±6.22	p<0.0001	72.85±6.07	p<0.0001	p<0.0001
After 3 minutes of intubation	80.72±6.21	p =0.124 p> 0.05	71.77±6.09	p<0.0001	p<0.0001
After 5 minutes of intubation	79.1±6.17	p=0.159 p> 0.05	70.65±12.6	p<0.0001	p<0.0001
After 10 minute of intubation	77.67±5.84	p=0.679 p>0.05	65.37±68	p<0.0001	p<0.0001

Table 3: Changes in Systolic Blood Pressure.

Time	Control group		Study Group		Inter Group
	SBP	Intra group p value	SBP	Intra group p value	p value
Base line	116.75±10.33	N A	117.78 ±7.78	N A	p = 0.615 p > 0.05
120 minutes after study drug	117.92±10.34	p=0.614 p> 0.05	113.93 ± 7.85	p=0.030 p < 0.05	p=0.66 p > 0.05
Just after induction	115.62±10.22	P=0.624 p> 0.05	110.93±7.98	p=0.0002 p<0.01	p=0.285 p > 0.05
Laryngoscopy & intubation	125.67±9.72	p=0.0002 p > 0.05	112.85±7.85	p=0.0061 p<0.01	p=0.0001 p < 0.01
After 1 minute of intubation	130.37±9.68	p<0.0001	105.43±7.29	p<0.0001	p<0.0001
After 2 minute of intubation	126.7±9.621	p<0.0001	101.63±7.23	p<0.0001	p<0.0001
After 3 minute of intubation	121.27±9.73	p=0.047 p < 0.05	99.2±7.08	p<0.0001	p<0.0001
After 5 minute of intubation	118.20±9.68	p=0.519 p> 0.05	97.82±6.79	p<0.0001	p<0.0001
After 10 minute of intubation	115.87±9.48	p=0.695 p> 0.05	97.17±6.47	p<0.0001	p<0.0001

Table 4: Changes in Diastolic Blood Pressure.

Time	Control group		Study Group		Inter Group
	DBP	Intra group p value	DBP	Intra group p value	p value
Baseline	76.66 ± 6.49	N A	74.83± 6.28	N A	p = 0.02 p < 0.05
120minutes after study drug	81.57±6.13	P=0.0040 p<0.01	72.42±6.75	p = 0.1023 p >0.05	P<0.0001
Just after induction	78.47±6.14	P=0.203 p >0.05	70.92±6.48	p = 0.0076 p >0.05	P<0.0001
At laryngoscopy & intubation	81.65±8.43	P=0.0040 p<0.01	74.37±6.22	p = 0.742 p >0.05	P<0.0001
After 1 minute of intubation	85.75±7.45	p<0.0001	68.67±5.64	P<0.0001	P<0.0001
After 2 minute of intubation	82.67±7.45	P=0.0002 p<0.01	65.ax30±6.0	p<0.01 p<0.0001	P<0.0001
After 3 minute of intubation	79.35±6.65	p = 0.07 p >0.05	64.27±5.96	p<0.0001	P<0.0001
After 5 minute of intubation	76.35±6.65	p = 0.833 p >0.05	63.42±5.89	p<0.0001	P<0.0001
After 10 minute of intubation	74.375±6.28	p = 0.123 p >0.05	62.82±6.28	p<0.0001	P<0.0001

Table 5: Changes in Mean Arterial Pressure.

Time	Control group		Study Group		Inter Group
	MAP	Intra group p value	MAP	Intra group p value	p value
Baseline	89.98±7.4	N A	89.26±6.13	N A	p = 0.09 p > 0.05
120 min after study drug	93.67±7.57	p = 0.03 p < 0.05	86.18±6.49	p = 0.032 p < 0.05	p = 0.9 p > 0.05
Just after induction	91.18±8.34	P=0.498 p> 0.05	84.28±6.44	P=0.0005 p<0.01	p = 0.03 p < 0.05
At laryngoscopy & intubation	96.28±8.2	P=0.0005 p<0.01	87.19±6.14	P=0.1354 p> 0.05	p < 0.0001
After 1 minute of intubation	99.72±9.13	p<0.0001	80.95±5.29	p<0.0001	p <0.0001
After 2 minute of intubation	97.37±7.7	p<0.0001	77.40±5.65	p<0.0001	p < 0.0001
After 3 minute of intubation	93.32±7.29	p =0.0391 p> 0.05	76.50±6.43	p<0.0001	p < 0.0001
After 5 minute of intubation	90.22±7.16	P=0.8351 p> 0.05	74.83±5.53	p<0.0001	p < 0.0001
After 10 minute of intubation	88.60±7.16	P=0.3992 p> 0.05	74.30±5.0	p<0.0001	p < 0.0001

Table 6: Intraoperative complications:

Parameter	Control Group		Study Group	
	No. of patients	%	No. of patients	%
Nausea & vomiting	0	0	1	2.5
Bradycardia	0	0	1	2.5
Hypotension	0	0	1	2.5
Arrhythmias	0	0	0	0
Headache	0	0	0	0
Respiratory depression	0	0	0	0

Systolic blood pressure(SBP), the Diastolic blood pressure(DBP), Mean arterial pressure(MAP) and the SpO2 were comparable in both groups but not significant statistically (p>0.05).

Table 2 shows the changes in pulse rate in both the study and control groups at various time intervals starting from baseline up to 10 minutes post induction. At baseline and just before intubation, pulse rate was comparable in both groups (p>0.05, statistically not significant).

On intragroup comparison, in the group M, there was only a minimal rise in pulse rate from baseline, at laryngoscopy & intubation (p>0.05-not significant). Whereas in the control group, there was a major rise in pulse rate at laryngoscopy & intubation(p<0.01, highly significant). On intergroup comparison; patients in the group M who received melatonin tablets before intubation, showed only minimal rise in the pulse rate when compared to the major rise in group C. But this difference in rise of PR between 2 groups became statistically significant only after 1 minute post intubation (p<0.01-highly significant).

Table 3 shows the changes in Systolic Blood Pressure starting from baseline up to 10 minutes of induction in both groups. On intragroup comparison, in the group M, there was no rise in SBP from baseline, at laryngoscopy &intubation (p>0.05-not significant). The SBP in group M was on decreasing side settled down and remained stable at lower side throughout the duration of 10 minutes post intubation (p<0.01-highly significant). Whereas in the group C, there was a majorrise in SBP at laryngoscopy & intubation (p<0.01, highly significant),which persisted at 1 min 2 min & 3 min readings(p<0.01, highly significant).After 3 min it started getting settle down & reached close to the base line at the end of 10 min(p >0.05- not significant)

Table 4 shows the changes in Diastolic Blood Pressure starting from baseline up to 10 minutes of induction in both groups. On intragroup comparison, in the group M, there was no rise in DBP from baseline, at laryngoscopy & intubation (p>0.05-not significant). The DBP in group M was on decreasing side settled down and remained stable at lower side throughout the duration of 10 minutes post intubation (p<0.01-highly significant). Whereas in the group C, there was a major rise in DBP at laryngoscopy & intubation (p<0.01, highly significant),which persisted at 1 min 2 min & 3 min readings (p<0.01, highly significant). After 3 min it started getting settle down & reached close to the base line at the end of 10 min (p >0.05- not significant)

Table 5 shows the changes in Mean Arterial Pressure starting from baseline up to 10minutes of induction in both groups. On intragroup comparison, in the groupM, there was no rise in MAP from baseline, at laryngoscopy & intubation (p>0.05-not significant). The MAP in group M was on decreasing side settled down and remained stable at lower side throughout the duration of 10 minutes post intubation (p<0.01-highly significant). Whereas in the group C, there was a majorrise in MAPat laryngoscopy & intubation (p<0.01, highly significant),which persisted at 1 min 2 min & 3 min readings (p<0.01, highly significant).After 3 min it started getting settle down & reached close to the base line at the end of 10 min (p >0.05- not significant)

Intra as well as inter group comparison showed no significant change in oxygen saturation throughout the intraoperative period.

Nausea & vomiting was seen in one patient from study group & was treated with inj.Ondansetroniv. Hypotension was observed in 1 patient from the study group. This was treated effectively with injection ephedrine 5 mg IV. Bradycardia was seen in one patient from study group & was treated with inj.atropine 0.6mg iv No other complication was observed in any of the two groups intraoperatively.

Discussion

The present study is aimed at assessing the role of melatonin in attenuating haemodynamic responses to laryngoscopy and intubation. Melatonin (N-acetyl-5-methoxytryptamine) is a pineal gland hormone which controls the circadian rhythm. It has been used for sleep disorders, jet lag, perioperative anxiolysis and sedation, cognitive and psychomotor functions.[9-12] It was assumed that its inhibitory actions on central nervous system responsible for sedation and anxiolysis may have a role in attenuating haemodynamic responses to laryngoscopy and intubation. Rosenberg et al. studied the role of perioperative melatonin in the modification of surgical stress response indicating that melatonin has sympatholytic activity.[13] This is in support of our assumption. The peak effect of exogenous melatonin ranges from 60 to 150 min.[14] Based on this, we made a hypothesis that melatonin can provide haemodynamic stability during laryngoscopy and intubation when given 120 min before the procedure.

The ratio of Male to Female in Group C is 21:19 and in Group M is 20:20. Other studies like

Priyamvada Gupta et al, 2016 and M Ahmed. A Mohammed et al, 2014 had almost similar gender ratio.[15,16]

The mean baseline pulse rate was 77.1±6.42 in Group C and 79.4±6.72 in Group M. It was comparable in both the groups, p>0.05 statistically not significant. However, in a similar study, no difference was observed in the changes of heart rate in the melatonin groups as compared to the placebo group.[16] The heart rate lowering effect of melatonin may be attributed to its anxiolytic actions. The underlying mechanism is probably the synergy between melatonergic and GABAergic systems. It also has analgesic effects as observed by various investigators and this may also contribute to the haemodynamic stability.[17]

The mean baseline systolic blood pressure (SBP) was 116.75±10.33 in Grp C and 117.78±7.78 in Grp M. It was comparable in both the groups i.e. p>0.05, not significant. In group C there was significant rise in SBP at laryngoscopy & intubation which only settled down 10 minutes post intubation. In group M there was no rise in SBP throughout the study period of 10 minutesas compared to baseline value . Similar trends were observed for diastolic and mean blood pressure.

It has been studied that melatonin reduces mean blood pressure in healthy volunteers.[18,19] A study on rats revealed that pinealectomy resulted in severe hypertension.[20] Mohammed et al. compared the role of oral melatonin 6 mg and 9 mg with placebo administered 1 h before surgery in attenuating pressor response to laryngoscopy and intubation. They observed that there was a reduction of blood pressure with regard to systolic, diastolic and mean blood pressure; and perfusion index in both melatonin groups as compared to the placebo group.

The mechanism of effect of melatonin on circulation is complex. The blood pressure lowering effect may be attributed to the specific binding of melatonin to melatonin receptors in the blood vessels, interfering with the vascular response to catecholamines.[21] It may interfere with the peripheral as well as central autonomic system, causing a reduction in adrenergic outflow and resulting catecholamine levels. Furthermore, it may induce relaxation of arterial wall smooth muscle by enhancing the availability of nitric oxide. In addition, it may also act via specific receptors melatonin type 1 or melatonin type 2 located peripherally in the blood vessels and centrally in blood pressure regulating area of the brain. It also has free radical scavenging effect leading to dilatation of blood vessels, and it may work via epigenetic mechanism at area postrema in the brain. The blood pressure lowering effect could also be due to the sedative action of orally administered melatonin. The sedative effect is mainly due to binding at GABA-A receptor and exerting its anaesthetic effect.[22]

The baseline SpO2 was 98.98±0.35 in Group C and 98.35±0.48 in Group M. In our study no significant difference in SpO2 was found in both the groups during the intra-operative period (p>0.05). Our finding are in consonance with those of others like Priyamvada Gupta et al, 2016 & Ahmed. A. Mohammed, 2014 in whom SPO2 was comparable in all the groups.[15,16] Nausea & vomiting was seen in one patient from study group & was treated with inj.Ondansetron iv. Hypotension i.e. systolic blood pressure < 90mmHg was observed in 1 patient from the study group. Bradycardia was seen in one patient from study group. No other complication was observed in any of the two groups intraoperatively. Various studies indicate that melatonin has an excellent safety profile. Very high doses up to 300 mg/day orally for 2 years have been administered safely.[23] Even in children doses up to 20 mg have been used without any significant side effects apart] from sedation.[24] Kain et al. safely used 0.4 mg/kg oral melatonin in children.[25] There is no liability to cause dependence and addiction. It may cause fatigue (4%) or nausea (3%). Dizziness, headache and irritability may be seen in some patients with use of very high doses in some previous studies of melatonin done for its anxiolytic action.[26] Thus, proving that melatonin is a useful drug for use as an adjunct in anaesthesia. The correct dosage in humans seems largely unknown and requires further studies.

The role of melatonin in anaesthesia and critical care has been elaborately discussed in the literature; it has been mentioned as a wonder drug with a wide spectrum of beneficial uses in anaesthesia and critical care including antioxidant and neuroprotective properties besides hypnosis, anxiolysis, analgesia and others.[27] The use of melatonin for attenuation of haemodynamic responses before laryngoscopy and intubation is superior to few other drugs studied for the same purpose. For instance, melatonin is superior to dexmedetomidine since the latter is associated with significant bradycardia and hypotension.[28]

Conclusion

Administration of oral melatonin premedication 120 minutes before surgery results in Significant

attenuation of the rise in systolic, diastolic and mean arterial blood pressure at the time of laryngoscopy & intubation and Transient increase in pulse rate which settled down within 1 minute after intubation and remained stable throughout the study period. After conducting the study we conclude that TabletMelatonin is a better alternative with minimal side effects in attenuating hemodynamic responses to laryngoscopy &intubation.

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