

A COMPARATIVE TRIAL STUDYING THE EFFECTIVENESS OF ORAL CLONIDINE AND PREGABALIN PREMEDICATION IN ATTENUATION OF HAEMODYNAMIC RESPONSE FOLLOWING LARYNGOSCOPY AND ENDOTRACHEAL INTUBATION

Aftab Ahmad Khan¹, Shahzada Gani², Fayaz Ahmad Munshi³, Basharat Saleem⁴, Shaiq Hameed⁵, Mushtaq Ahmad Rather⁶

HOW TO CITE THIS ARTICLE:

Aftab Ahmad Khan, Shahzada Gani, Fayaz Ahmad Munshi, Basharat Saleem, Shaiq Hameed, Mushtaq Ahmad Rather. "A Comparative Trial Studying the Effectiveness of Oral Clonidine and Pregabalin Premedication in Attenuation of Haemodynamic Response Following Laryngoscopy and Endotracheal Intubation". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 41, May 21; Page: 7134-7143, DOI: 10.14260/jemds/2015/1038

ABSTRACT: BACKGROUND: The airway instrumentation of direct laryngoscopy and tracheal intubation are powerful noxious stimuli that should be attenuated by appropriate premedication, smooth induction and rapid intubation. The present study evaluated the clinical efficacy of oral premedication with Clonidine and Pregabalin in attenuating the hemodynamic response following laryngoscopy and endotracheal intubation. **MATERIAL AND METHODS:** A total of 120 healthy adult consented patients aged 20 to 50 years with American Society of Anesthesiologist (ASA) physical status I of either sex scheduled to undergo elective general surgical procedures under general anaesthesia, were randomized to receive clonidine (300µg) Group 1, pregabalin (75mg) Group 2, or placebo Group 3, given 120 minutes before surgery as oral premedication. Anaesthetic technique was standardized and all groups were compared for preoperative sedation and anxiety level, along with the haemodynamic changes after premedication, before and after induction, after laryngoscopy and intubation, and along with the intraoperative haemodynamic stability and post-operative side-effects. **RESULTS:** Oral clonidine (300µg) given 120 min before induction was effective in attenuating haemodynamic stress response to laryngoscopy and endotracheal intubation besides providing effective pre-operative anxiolysis and sedation. Oral pregabalin (75mg) given 120 min before induction was not effective in attenuating hemodynamic stress response to intubation, although it provided a moderate level of anxiolysis and minimal sedation as compared to placebo. No significant differences in the parameters of recovery were observed between the groups. None of the premeditated patient has suffered from any postoperative side effects. **CONCLUSION:** Oral premedication with Clonidine 300µg was superior to pregabalin 75mg resulting in adequate sedation and pre-op anxiolysis along with hemodynamic stability during laryngoscopy and endotracheal intubation, without prolongation of recovery time and side effects.

KEYWORDS: Haemodynamic pressor response, intubation, laryngoscopy, pregabalin, clonidine, sedation, anxiety.

INTRODUCTION: Laryngoscopy is a noxious and most invasive stimulus during endotracheal intubation.^{1,2} Manipulation of the respiratory tract such as during laryngoscopy and endotracheal intubation are associated with hemodynamic and cardiovascular responses consisting of increased circulating catecholamines, heart rate, blood pressure, myocardial oxygen demand, and dysrhythmias.

ORIGINAL ARTICLE

In 1940, Reid and Brace first described hemodynamic response to laryngoscopy and endotracheal intubation.³ Many studies have concentrated on the stressful stimulus of laryngoscopy and endotracheal intubation and a number of pharmacological measures such as adrenoreceptor blockers, opioids, calcium channel blockers and vasodilators have been used to attenuate the hemodynamic stress response to laryngoscopy and endotracheal intubation with variable results.

Clonidine and other α 2-adrenoceptor agonists like Dexmedetomidine are under intense investigation as an adjunct to anesthesia.⁴ These drugs reduced anesthetic requirements, attenuate adrenergic, hormonal, and hemodynamic stress responses to surgery, reduce anxiety, and lead to sedation.⁵ A dose of 300 μ g clonidine orally or larger reduces sympathetic activity. The risk of undesirable side effects is extremely important in evaluating the overall safety of pre-anesthetic medication. The potentially beneficial effect of α 2 adrenoceptor agonists may be negated by bradycardia and hypotension.^{6,7,8}

Gabapentin was introduced as an antiepileptic drug in 1993. The most recent studies aiming attenuating hemodynamic response to laryngoscopy and intubation focused on the effect of gabapentin.⁹

Pregabalin, like gabapentin is a novel drug that has analgesic, anticonvulsant and anxiolytic effect. It is mainly used for the treatment of neuropathic pain, postherpetic neuralgia and as adjunctive therapy in patients with partial onset seizures. The efficacy of oral pregabalin on postoperative analgesia and reduction of parenteral analgesics has been demonstrated in several studies. Only few data is present in literature relating the cardiovascular properties of pregabalin on the patients undergoing surgery.¹⁰⁻¹²

The present study was performed to compare the effect of oral Clonidine and Pregabalin premedication with placebo on preoperative sedation and anxiety, and in attenuating the hemodynamic stress response following laryngoscopy and endotracheal intubation.

METHODS: After obtaining approval from Hospital Ethical Committee, a written informed consent was taken from the patients for participation in this study. The study was designed as a hospital based prospective randomized placebo controlled trial involving 120 patients of ASA physical status I, of either sex, in the age group 20-50 years, scheduled to undergo elective general surgical procedures under general anaesthesia.

The patients excluded from the study were:

- ASA physical status II or greater,
- Age more than 50 years or less than 20 years,
- Anticipated difficult intubation,
- Overweight with BMI > 25,
- Patients concomitantly on Pregabalin or Clonidine or consumption of anti-hypertensive drugs, sedatives or hypnotics,
- Patients with comorbid conditions like Diabetes, hypertension, ischemic heart disease, chronic kidney disease or chronic liver disease and Patients allergic to study medications.

Patients selected for surgery were admitted 24 hours prior to surgery. Pre-anaesthetic evaluation was done at this stage. Age, gender, weight, type of surgery, ASA physical status was noted

ORIGINAL ARTICLE

down in all patients. A thorough history including history of any co-morbid disease, previous anaesthetic exposure, smoking, medications, allergy to any drugs and personal habits was elicited.

General physical examination as well as systemic examination of cardiovascular system, respiratory system and central nervous system was performed. Airway assessment was also done to predict any difficult intubation. All routine investigations like hemoglobin, platelet count, BT/CT, blood urea and serum Creatinine, blood glucose, chest X-ray (P/A view), ECG were checked. The patients were advised to remain fasting overnight.

The patients were randomly allocated to three equal groups of 40 each by means of a computer generated table of random numbers. Group 1: received Tablets of Clonidine (300 µg), Group 2: received Capsules of Pregabalin (75mg) and Group 3: received Placebo.

Pre-operative anxiety and sedation were assessed before giving the drug to the patients and 120 minutes after giving the drug in the pre anaesthetic room. The degree of sedation and anxiolysis was graded as (Described by Raval, Mehta et al).¹³

Sedation Scoring: 0-awake and talkative, 1-awake but uncommunicative, 2-drowsy, quiet and easily arousable, 3- asleep.

Anxiety Scoring: 0-quiet and comfortable, 1-uneasy, 2-worried or anxious, 3-very worried or very upset, 4 - frightened or terrified.

Intravenous line was established with an 18 G cannula and infusion of DNS started. Multichannel monitor with all the standard monitoring including heart rate, non-invasive Blood Pressure, SpO₂ and ECG was attached to the patient. Pre-oxygenation with 100% O₂ was done for 3 minutes. Subsequent induction was done with inj. Sodium Thiopentone 4-5mg/kg, subsequent relaxation was accomplished with inj. Succinylcholine 1.5 mg/kg.

Direct laryngoscopy and endotracheal intubation was performed by experienced anesthesiologist. Duration of laryngoscopy was recorded in all the patients. Any patient with more than one attempt required for intubation and patients requiring more than 30 seconds for intubation were dropped out from the study. No stimulus was applied for the first 5 minutes. Anaesthesia was maintained with Oxygen (33%), Nitrous oxide (66%) and Isoflurane (1%), used as inhalational agent. Inj. Atracurium was used as a muscle relaxant intra-operatively. At the end of the surgical procedure, residual neuromuscular block was antagonized with Inj. Neostigmine 50µg/kg IV, and Inj. Glycopyrrolate 5µg/kg IV. After extubation the patients were shifted to post anaesthesia recovery room and discharged from recovery once adequate level of consciousness with adequate muscle power was achieved.

The Heart Rate, Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP), and Mean Arterial Pressure values were recorded at: Baseline, Before induction, Immediately before intubation, 1, 3, 5, and 10 minutes after intubation. Any side effects like hypotension, bradycardia, dry mouth, vomiting, or others were recorded.

Statistical software SPSS (version 16.0) and Microsoft Excel were used to carry out the statistical analysis of data. Data was analyzed by means of descriptive statistics viz, means, standard deviations and percentages. Chi-square test or Fisher's exact test, whichever appropriate, was used for qualitative data. Analysis of variance (ANOVA) test was employed for inter group analysis and for multiple comparisons least significant difference (LSD) test was used.

ORIGINAL ARTICLE

Intra group analysis was carried out with the help of Paired t-test. A P-value of less than 0.05 was considered statistically significant.

RESULTS: A total of 120 patients, with 40 patients in each group were evaluated. All groups were comparable with respect to the demographic parameters. No significant differences were found between groups with respect to age, weight, gender, time between oral premedication to anaesthetic induction and duration of laryngoscopy (Table 1).

Variable	Group 1 (n=40)	Group 2 (n=40)	Group 3 (n=40)	p-value
Age in years	37.8±6.70	39.7±8.41	36.6±8.30	0.208
Weight in kgs	58.2±6.21	57.5±6.16	58.7±6.92	0.686
Sex Ratio (M/F)	22/18	18/22	18/22	0.586
Duration of laryngoscopy (in seconds)	18.5±4.20	18.8±5.07	19.2±4.25	0.786

Table 1: Demographic Profile, duration of laryngoscopy (Mean±SD)

p<0.05 significant.

Preoperative Sedation and Anxiety Level: The degree of sedation before premedication was comparable between the groups. However, they were anxious at baseline, score 1 i.e., uneasy. A clear increase (from score 0 to 1) in sedation was observed in clonidine group as compared with pregabalin and control groups (Table 2). A significant decrease (from score 1 to 0) in anxiety was observed with clonidine group but it was only moderate with pregabalin group as compared with control group (Table 3). Preoperative sedation and anxiolysis was higher in oral clonidine (group1) as compared with oral pregabalin (group 2).

Sedation Score	Group 1 (n=40)		Group 2 (n=40)		Group 3 (n=40)	
	Before drug	120min after drug	Before drug	120min after drug	Before drug	120min after drug
0 = awake and talkative	37 (92.5%)	11(27.5%)	39 (97.5%)	31 (77.5%)	38 (95%)	40 (100%)
1 = awake but uncommunicative	3 (7.5%)	29 (72.5%)	1 (2.5%)	8 (20%)	2 (5%)	0
2 = drowsy, quite and easily arousable	0	0	0	1(2.5%)	0	0
3 = asleep	0	0	0	0	0	0

Table 2: Sedation score among three groups before and after giving the drug

ORIGINAL ARTICLE

Anxiety Score	Group 1 (n=40)		Group 2 (n=40)		Group 3 (n=40)	
	Before drug	120min after drug	Before drug	120min after drug	Before drug	120min after drug
0 = quiet and comfortable	1(2.5%)	37(92.5%)	1(2.5%)	12(30%)	2(5%)	1(2.5%)
1 = uneasy	34(85%)	3(7.5%)	31(77.5%)	23(57.5%)	33(82.5%)	24(60%)
2 = worried or anxious	4(10%)	0	8(20%)	5(12.5%)	5(12.5%)	9(22.5%)
3 = very worried or very upset	1(2.5%)	0	0	0	0	6(15%)
4 = frightened or terrified	0	0	0	0	0	0

Table 3: Anxiety score among three groups before and after giving the drug

Cardiovascular Changes: There was no significant difference in the preoperative heart rate values in the three groups. Compared with control and pregabalin groups, clonidine group showed statistically significant decrease in heart rate before induction. The heart rate increased significantly immediately after intubation in groups 2 and 3, but the increase was least in group 1 (clonidine). Maximum increase in heart rate from baseline was observed after 1 min of laryngoscopy. Throughout anaesthesia there was statistically significant attenuation in the HR values when clonidine was compared with placebo and pregabalin. But there was no statistically significant difference when pregabalin was compared with placebo (Table 4).

Heart Rate	Group 1 (Mean±SD)	Group 2 (Mean±SD)	Group 3 (Mean±SD)	p-value (ANOVA)
Base line	78.7±10.13	80.6±7.10	81.2±10.56	0.464
Before Induction	65.7±12.54	85.6±9.48	86.5±10.36	<0.001
Immediate before Intubation	75.8±9.29	88.7±12.64	87.6±10.23	<0.001
1 min after intubation	88.7±10.90	104.7±9.45	103.5±11.0	<0.001
3 min after intubation	85.3±11.27	98.8±9.60	100.5±8.41	<0.001
5 min after intubation	84.2±9.92	91.5±11.27	93.3±8.40	<0.001
10 min after intubation	67.4±10.78	86±11.02	87.5±7.66	<0.001

Table 4: Changes in heart rate during anaesthesia (beats per min)

p<0.05 significant, p<0.01 highly significant.

No significant difference was observed in MAP before premedication in the groups. Preoperative MAP changes were statistically significant in groups. After laryngoscopy and intubation, there was statistically significant attenuation in the MAP values when clonidine was compared with placebo and pregabalin. But there was no statistically significant difference when pregabalin was compared with placebo (Table 5).

ORIGINAL ARTICLE

Observations	Group 1 (Mean±SD)	Group 2 (Mean±SD)	Group 3 (Mean±SD)	p-value
Base line	90.4±5.24	91.5±5.92	91.1±4.07	0.614
Before Induction	82.9±3.35	98.1±5.20	98.5±4.87	<0.001
Immediate before Intubation	88.6±5.75	101.1±3.65	101.2±6.06	<0.001
1 min after intubation	100.5±6.10	115.9±3.46	117.1±3.77	<0.001
3 min after intubation	96.3±4.73	111±4.25	112.2±5.41	<0.001
5 min after intubation	90.1±6.32	103.2±4.66	104±4.94	<0.001
10 min after intubation	84.8±8.89	95.8±7.92	97.9±4.02	<0.001

Table 5: Changes in Mean MAP during anaesthesia (in mm of Hg)

p<0.05 significant, p<0.01 highly significant, MAP: Mean arterial pressure.

Intraoperative heart rate and mean arterial blood pressure values were less and close to baseline levels in clonidine premeditated group as compared to pregabalin and control groups. No analgesic supplement was needed for premeditated groups. Clinically significant respiratory depression, hypotension or bradycardia was not seen in any of the study groups. There was no difference among the three groups with respect to awakening and recovery time. No post-operative nausea and vomiting, or any other post-operative complication was recorded in any of the study groups.

DISCUSSION: The present study evaluated the efficacy of oral clonidine with pregabalin premedication in attenuating the hemodynamic stress response to laryngoscopy and endotracheal intubation. We observed the anxiolytic and sedative effects of oral premedication without any significant respiratory depression. Hemodynamic responses of laryngoscopy and endotracheal intubation were attenuated by oral premedication with clonidine than oral pregabalin. The increase in hemodynamic variables in pregabalin and control groups may be due to inadequate sedation and analgesia. Near stable hemodynamic variables and absence of any sympatho-somatic response with oral clonidine in the present study was an indication of adequate analgesia and sedation. In our study we have used oral premedication with clonidine 300µg and pregabalin 75mg and results were in agreement with recent results for clonidine and pregabalin.

Saini V et al,¹⁴ and Ahmed B A et al,¹⁵ have used oral clonidine for premedication in the dose of 5µg/kg & 150µg respectively 90-120min before intubation. Hidalgo et al,¹⁶ have used multiple doses of oral clonidine to evaluate pre-operative anxiety. They have administered oral clonidine 100 µg or placebo the night before surgery (10:00 pm), 1 h before the anesthesia, and 24 h after surgery. These authors observed good anxiolysis with the said doses of oral clonidine. Our study with a dose of 300µg oral clonidine given 120 minutes before induction confirms these findings and we observed effective pre-operative anxiolysis in 92.5% of the patients.

Clonidine produced sedation in 33.33% of patients in a study conducted by Ahmed B A et al,¹⁵ using a dose of 150µg given 90-120 minute before intubation. Our study with 300µg oral clonidine we observed sedation in 72.5% of the patients.

ORIGINAL ARTICLE

White PF et al,¹⁰ concluded, preoperative pregabalin administration (75-300mg po) increased perioperative sedation in a dose-related fashion, but failed to reduce preoperative state anxiety, postoperative pain, or to improve the recovery process after minor elective surgery procedures. Gupta K et al,¹¹ concluded that Oral premedication with pregabalin 150 mg or clonidine 200µg causes a clear increase in sedation and a moderate decrease in anxiety as compared with control.

Preoperative sedation and anxiolysis was higher in oral pregabalin group as compared with clonidine group. Bhawna Rastogi et al¹² in their dose response study concluded that sedation was higher in the pregabalin 150mg group at the pre-induction stage as compared with pregabalin 75mg group and placebo. Our study does confirm these findings i.e. pregabalin 75mg does not produce effective pre-operative sedation (20%) although moderate level of anxiolysis was seen in (30%) of the patients.

A variable combination of drugs used for premedication, induction, relaxation and maintenance of anaesthesia can influence the sympathetic response to laryngoscopy and intubation. The patients enrolled in our study did not receive any other premedication other than the study drugs.

Mean duration of laryngoscopy in all the three groups was 18 seconds. A linear increase in heart rate and mean arterial pressure during the first 45 seconds has been observed. Robert K Stoelting noted that the best way to prevent laryngoscopic reactions was to minimize the duration of laryngoscopy and intubation. He noted that if laryngoscopy and intubation were performed within 15 seconds, the hemodynamic changes seemed to be minimal.¹⁷ Hence in our study the duration of laryngoscopy was restricted as much as possible and all the laryngoscopy and intubations were performed by an expert anaesthesiologist.

Analysis of Data Related to Stress Response: In the present study, the groups were comparable with respect to their demographic variables and their baseline values of Heart Rate, Systolic Blood Pressure and Diastolic Blood Pressure and Mean Arterial Pressure. There was a significant increase in SBP, DBP, MAP and Heart Rate compared to baseline in all the groups during laryngoscopy and endotracheal intubation. But there was lesser rise in clonidine group when compared to other two groups.

The heart rate increased by 27.7% 1 min after direct laryngoscopy and endotracheal intubation compared to baseline value in the placebo group ($p < 0.01$). A similar increase in pregabalin group was 29.9% and in clonidine group was 12.7%. Attenuation of rise in the heart rate by clonidine is evident and statistically significant when compared with pregabalin & placebo ($p < 0.001$).

Subsequently heart rate started to settle down and approached to baseline in clonidine group at the end of 5 min but was still high in pregabalin and placebo groups even after 10 min. Though there were decreased heart rate values in pregabalin group there was no statistically significant difference when compared to placebo indicating that pregabalin was not successful in attenuating the increase in HR following laryngoscopy and endotracheal intubation.

Mean arterial pressure increased by 28.5% in placebo group while it increased by 26.6% in pregabalin group and only by 11.17% in clonidine group compared to baseline values during laryngoscopy and intubation. Attenuation of mean arterial pressure is significant in clonidine group as compared to both pregabalin and placebo groups ($p < 0.01$).

ORIGINAL ARTICLE

There was significant reduction in HR, BP in clonidine group during the pre-induction period (120 min after oral administration) which was not observed with other two groups. In the other two groups, instead of fall, a rise in HR & BP was observed during the pre-induction period.

The efficiency of clonidine in attenuation of cardiovascular responses similar to our study has been verified by many other studies. Batra YK, Indu B, Puri GD have studied the attenuation of pulse rate and blood pressure response to laryngoscopy and tracheal intubation by clonidine in forty healthy patients. Heart rate and blood pressure were significantly lower in the clonidine treated group immediately after intubation ($p < 0.001$).¹⁸ Laurito et al found that clonidine blunted the hemodynamic response (HR, SBP and DBP) to 15 sec laryngoscopy but not to 45 sec laryngoscopy when compared with the corresponding control group.¹⁹ All the above authors have used 5 μ g/kg clonidine which will be 300 μ g in an average 60kg adult. In our study we have used single dose of 300 μ g clonidine 120 min before induction. Our study fully confirms the findings of the above authors i.e. clonidine 300 μ g decreases the stress response (HR, SBP and DBP) to laryngoscopy and endotracheal intubation.

More recently, the studies have focused on oral pregabalin premedication in attenuation of cardiovascular response. Gupta K, et.al,¹¹ in their placebo controlled randomized comparative study evaluated the clinical efficacy of oral premedication with Pregabalin (150mg) or Clonidine (0.2mg) for haemodynamic stability during laryngoscopy and laproscopic cholecystectomy given 75 to 90 minutes before surgery. Clonidine was superior to pregabalin for attenuation of the hemodynamic responses to laryngoscopy and laparoscopy, but it increased the incidence of intra-and postoperative bradycardia. No significant differences in the parameters of recovery were observed between the groups. Results of our study are in accordance though the doses of clonidine and pregabalin we used were 0.3mg and 75mg respectively.

Bhawna Rastogi et al,¹² evaluated the safe and clinically effective dose of oral pregabalin premedication for attenuation of haemodynamic pressor response of airway instrumentation. The haemodynamic pressor response of airway instrumentation was attenuated in a dose-related fashion. The premedicated patients were hemodynamically stable perioperatively without prolongation of recovery time and side-effects. Our study confirms these findings i.e., pregabalin 75mg (Used in lower doses) doesn't attenuate hemodynamic pressor response of airway instrumentation. Ebru Salman et al,²⁰ investigated the effect of pregabalin premedication on the hemodynamic responses to laryngoscopy and intubation. They concluded oral pregabalin premedication at a dose of 150mg one hour prior to surgery attenuates early hemodynamic changes associated with laryngoscopy and endotracheal intubation. In our study dose of pregabalin used was 75mg and we didn't corroborate these findings.

In our study, we found no significant attenuation of HR with laryngoscopy and endotracheal intubation with single dose of pregabalin 75mg. Our study design and patient selection with respect to age, sex and ASA status was similar to the above studies. The negative result that pregabalin did not attenuate stress response could be due to the lower single dose of pregabalin (75mg) which we used. Our negative result may be explained by the findings of Bhawna Rastogi and Kumkum Gupta who in their study found that the haemodynamic pressor response of airway instrumentation by pregabalin was attenuated in a dose-related fashion.¹²

CONCLUSION: Oral clonidine (300 μ g) given 120 min before induction was effective in attenuating haemodynamic stress response to laryngoscopy and endotracheal intubation besides providing

ORIGINAL ARTICLE

effective pre-operative anxiolysis and sedation. There was no statistically significant difference between placebo and pregabalin groups. Hence, Oral pregabalin (75mg) given 120 min before induction was not effective in attenuating hemodynamic stress response to intubation, although it provided a moderate level of anxiolysis and minimal sedation as compared to placebo.

REFERENCES:

1. Kovac AL, et al. controlling the hemodynamic response to laryngoscopy and endotracheal intubation. *J Clin Anesth* 1996; 8: 63-79.
2. Shribman AJ, Smith G, Achola KJ. Cardiovascular and catecholamine responses to laryngoscopy with and without tracheal intubation. *Br J Anaesth* 1987; 59: 295-9.
3. Reid LC, Brace DE. Irritation of respiratory tract and its reflex effect upon heart. *Surg Gynaec & Obst*; 1940; 70: 157-62.
4. Hayashi Y, Maze M. Alpha₂ adrenoceptor agonists and anaesthesia. *Br J Anaesth* 1993; 71: 108-18.
5. Kulka PJ, Tryba M, Zenz M. Dose-response effects of intravenous clonidine on stress response during induction of anesthesia in coronary artery bypass graft patients. *Anesth Analg* 1995; 80: 263-268.
6. Byrd BF III, Collins W, Primm K. Risk factors for severe bradycardia during oral clonidine therapy for hypertension. *Arch Int Med* 1988; 148: 729-33.
7. Ghignone M, Quintin L, Duke PC. Effects of clonidine on narcotic requirements and hemodynamic response during induction of fentanyl anesthesia and endotracheal intubation. *Anesthesiology* 1986; 64: 36-42.
8. Zalunardo MP, Zollinger A, Spahn DR, et al. Effect of intravenous and oral clonidine on hemodynamic and plasmacatecholamine response due to endotracheal intubation. *J Clin Anesth* 1997; 9: 143-7.
9. Raouf Ali, A., M. El Gohary, et al. Efficacy of preoperative oral gabapentin in attenuation of neuro-endocrine response to laryngoscopy and endotracheal intubation. *J. Med. Sci.*, 2009; 9: 24-29.
10. White PF, Tufanogullari B, Taylor J, Klein K. The effect of pregabalin on preoperative anxiety and sedation levels: a dose ranging study. *Anesth Analg* 2009; 108: 1140-1145.
11. Gupta K, Sharma D, Gupta PK. Oral premedication with pregabalin or clonidine for hemodynamic stability during laryngoscopy and laparoscopic cholecystectomy: A comparative evaluation. *Saudi J Anaesth* 2011; 5: 179-184.
12. Bhawna Rastogi, Kumkum Gupta, Prashant K Gupta. Oral pregabalin premedication for attenuation of haemodynamic pressor response of airway instrumentation during general anaesthesia: A dose response study. *Indian J Anaesth.* 2012 Jan-Feb; 56 (1): 49-54.
13. Raval, Mehta, et al. Oral clonidine pre medication for attenuation of haemodynamic response to laryngoscopy and intubation. *Indian J. Anaesth.* 2002; 46 (2): 124-129.
14. Saini v: et al. Oral Clonidine Premedication In Patients Undergoing Intraocular Surgery Under Local Anaesthesia. *J Anaesth Clin Pharmacol* 2009; 25 (3): 311-315.
15. Ahmed BA, Kakroo S, Jan NA, Ahmad SF. Effect of oral clonidine premedication on anxiety and sedation in Patients undergoing turp under spinal Anaesthesia *JK Practitioner.* 2001 Jan-Mar; 8 (1): 15-7.

ORIGINAL ARTICLE

16. Hidalgo et al. The Clinical Effect of Small Oral Clonidine Doses on Perioperative Outcomes in Patients Undergoing Abdominal Hysterectomy. *Anaesth Analg* 2005; 100 (3): 795-802.
17. Robert RK Stoelting. Attenuation of blood pressure responses to laryngoscopy and tracheal intubation with sodium nitroprusside. *Anaesthesia Analg.* 1979; 58 (2): 116-119.
18. Batra YK, Indu B, Puri GD. Attenuation of pulse rate and blood pressure response to laryngoscopy and tracheal intubation by clonidine. *Int J Clin Pharmacol Ther Toxicol* 1998, 26: 360-3.
19. Laurito CE, Baughman VL, Becker GL, Pygon BH, Citron GM. Oral clonidine blunts the hemodynamic responses to brief but not prolonged laryngoscopy. *J Clin Anesth* 1993; 5: 54-57.
20. Ebru Salman, Çağatay Çelik and Selim Candan. Premedication with Single Dose Pregabalin 150 Mg Attenuates Hemodynamic Response to Laryngoscopy and Endotracheal Intubation. 2012; 1: 297. doi: 10.4172/scientificreports.297.

AUTHORS:

1. Aftab Ahmad Khan
2. Shahzada Gani
3. Fayaz Ahmad Munshi
4. Basharat Saleem
5. Shaiq Hameed
6. Mushtaq Ahmad Rather

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Anaesthesiology & Critical Care, GMC Srinagar.
2. Post Graduate Scholar, Department of Anaesthesiology & Critical Care, GMC Srinagar.
3. Associate Professor, Department of Anaesthesiology & Critical Care, GMC Srinagar.

FINANCIAL OR OTHER

COMPETING INTERESTS: None

4. Professor & HOD, Department of Anaesthesiology & Critical Care, GMC Srinagar.
5. Senior Resident, Department of Medicine, GMC, Srinagar.
6. Senior Resident, Department of Anaesthesiology & Critical Care, GMC Srinagar.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Mushtaq Ahmad Rather,
Senior Resident,
Department of Anesthesiology & Critical Care,
GMC, Srinagar-190006.
E-mail: mushtaqahmad767@gmail.com

Date of Submission: 28/04/2015.
Date of Peer Review: 29/04/2015.
Date of Acceptance: 13/05/2015.
Date of Publishing: 19/05/2015.