ORIGINAL ARTICLE

Effect of Preoperative Gabapentin on Haemodynamic Response to Laryngoscopy and Tracheal Intubation in Patients Undergoing Any Elective Surgery

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ABSTRACT

Objective: To determine the effect of 800 mg oral gabapentin on haemodynamic response to laryngoscopy and tracheal intubation**.**
Study Design: Randomized controlled trial**.**
Setting: Services Hospital, Lahore, which is a tertiary care hospital, where almost all types of surgeries are performed.
Duration: The study was completed in 6 months (21 sep 2011 to 20th march 2012)
Sample Size: Total 110 patients were taken, which were divided into two equal groups.
Method: Group G patients received 800 mg oral gabapentin while Group C patients received placebo capsules two hour prior to surgery in the pre operative area. After induction of anaesthesia heart rate, systolic, diastolic and mean arterial blood pressures were recorded at baseline and then 1 minute after intubation.
Results: Out of total 110 patients there were 66 (60 %) males and 44 (40 %) females. Mean age was 37.1 in Group G and 36.3 in Group C. Overall there was less haemodynamic response in Group G as compared to the Group C. Group G had statistically significant decrease in mean heart rate, systolic and diastolic blood pressure at 1 minute post intubation.
Conclusion: Gabapentin significantly reduces haemodynamic response to laryngoscopy and intubation**.**
Keywords: Gabapentin, Pressor response, Haemodynamic response, Laryngoscopy

INTRODUCTION

During general anaesthesia endotracheal tube (ETT) is passed for maintenance of airway and protection from aspiration of gastric contents[1]..The response of the body to this laryngoscopy and tracheal intubation is stress response, which may include secretion of stress hormones e.g. catecholamines, glucagon, and antidiuretic hormone[2]. Stress hormone may also cause lacrimation, increase in intracranial pressure, increase in intra ocular pressure, increase in systemic blood pressure (B.P) and heart rate (HR) [3]. Haemodynamic response is well tolerated by young children and adults not having any cardiac problem, but this response can be catastrophic in cardiac patients, geriatric patients[4].

Medicines like Lidocaine sprayed or given intra venously decreases the haemodynamic response to laryngoscopy and tracheal intubation[5]. Ultra short acting opioids like fentanil, sufentanil, and remifentanil also suppress the haemodynamic response of laryngoscopy and intubation[6]. Beta blockers like Esmolol[7] is an attractive option because of its cardioselective adrenergic receptor blocking properties and ultra short duration of action..

Recently gabapentin, a second generation anticonvulsant has also been recommended to decrease the haemodynamic response to laryngoscopy and intubation[8]. Gabapentin was approved in 1993 by FDA for the control of partial seizures with the combination of other anti seizure drugs[9]

We planned to evaluate gabapentin in attenuation of haemodynamic response to direct laryngoscopy and tracheal intubation in normotensive patients undergoing elective surgery.

MATERIALS AND METHODS

This randomized controlled trial was completed in 6 months (21 sep 2011 to 20th march 2012) IN THE Department of Anaesthesia, Services hospital, Lahore. The technique was non-probability, purposive sampling. One hundred and ten patients were randomly divided into 2 equal groups.

Inclusion criteria

1. Patients of (ASA), physical status I-II
2. Patients undergoing any elective surgery of duration 2 to 3 hours.

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3. Age 20 to 40 years.
4. Haemodynamically stable patients (SBP 105-130 mm Hg, DBP 70-85 mm Hg, HR 60-100 beats/min).

Exclusion criteria

1. Anticipated difficult intubation
2. Patients with gastroesophageal reflux, cardiovascular, cerebrovascular, hepatic, and renal disease
3. Patients on antidepressants, antihypertensives, sedatives and hypnotics (medical record).
4. Hypertensive patients (BP ≥ 140/90 mmHg on two different ocassions).

Data collection: 110 patients fulfilling the inclusion criteria and willing to participate in the study were selected, divided into two groups by using lottery method.

Group G: The gabapentin group (55 patients) was given gabapentin 800mg capsule orally 2 hours before induction of anesthesia.

Group C: the control group (55 patients) was given placebo capsule filled with starch powder 2 hours before induction of anesthesia.

On arrival in the operation theatre, monitors were attached and baseline parameters such as heart rate, systolic B.P and diastolic B.P were noted. After laryngoscopy intubations was performed by an experienced anesthetist. Systolic and diastolic blood pressure and heart rate were recorded at 1 minute after intubation

Data analysis: All the data was analysed using the computer softwear SPSS version 12. The study variables were age, blood pressure and heart rate and standard deviation was calculated for both the variables. Quantitative variables like pulse and blood pressure were analysed by t test of significance. A p value of 0.05 or less was considered significant.

RESULTS

Table 1: Comparison of mean age of the subject under study

Study groups	N	Mean	Std. Deviation
Gabapentin	55	37	12
Placebo	55	36	14

Statistical Analysis: t =0.246 P = 0.8 (P>0.05)
There was no statistically significant difference of mean age between two study groups

Table 2: Comparison of mean heart rates in series of observations before and after induction with Gabapentin and placebo as pre-anesthetic drugs.

Baseline and after intubation	n=55		n=55		Confidence limits for the difference	t-test
	Mean	St. deviation	Mean	St. devoatopm		
Baseline	88	10	92	16	-11 to 2	0.187 (>0.05)
1 minute after intubation	103	14	109	12	-12 to 1	0.079 (>0.05)

Inference: Mean heart rate with Gabapentin was falling at lower side as compared to placebo

Table 3: Comparison of mean systolic BP before and after induction with Gabapentin and placebo as preanesthetic drugs.

Systolic BP and after intubation	Drug groups				Statistical analysis	
	A (Gabapentin) (n=55)		B (Placebo) (n=55)		95% Confidence limits for the difference	P value for t test
Baseline	123	12	127	13	-10 to 3	0.303 (>0.05)
1 minute after intubation	136	22	149	23	-24 to -2	0.027 (<0.05)

Inference: Mean systolic BP with Gabapentin was falling at lower side as compared to placebo

Table 4: Comparison of mean diastolic BP in series of observation before and after induction with Gabapentin and placebo as preanesthetic drugs.

Diastolic BP observation baseline and after intubation	Drug groups				Statistical analysis	
	A (Gabapentin) (n=55)		B (Placebo) (n=55)		95% Confidence limits for the difference	P value for t test
Baseline	78	12	78	11	-6 to 6	0.948(>0.05)
1 minute after intubation	87	19	94	19	-16 to 3	0.188 (>0.05)

Inference: Mean diastolic BP with Gabapentin was generally falling at lower side as compared to placebo

DISCUSSION

The results of our study showed that there was a generalized trend of less haemodynamic response in the gabapentin group as compared to the placebo group. Statistical analysis showed that mean heart rate with Gabapentin was significantly low at 1 minute at P=0.1.

Statistical analysis also showed that mean systolic BP with Gabapentin was at lower side as compared to placebo at 1 minute after intubation at P=0.05.

Mean diastolic BP with Gabapentin was generally falling at lower side as compared to placebo at 1 minute after intubation at P=0.05.

Fassoulaki and his colleagues studied the effect of gabapentin on pressor response to direct laryngoscopy and tracheal intubation[10]. In their study they took 46 patients, They observed the results before and after the anesthetic at 1, 3, 5 and 10 minutes of interval after intubation. Their results were not very different from our study and their results showed that systolic blood pressure was significantly lower at 1, 3, 5, and 10 minutes post intubation period.

Shashi Kiran and Deepak Verma evaluated the effect of gabapentin in attenuation of haemodynamic responses to direct laryngoscopy and tracheal intubation[11]. They took hundred patients, SAP was significantly lower in the gabapentin as compared to the control group 0, 1, 3, 5 and 10 min after intubation. DAP also was lower in the gabapentin group 0, 1, 3, and 5 min after intubation. MAP also was lower in the gabapentin group 0, 1, 3, and 5 min after intubation. HR also was lower in the gabapentin group 0, 1 and 3 min after intubation. The results of our study were very much similar with this study, reason being that they had used the same strength of gabapentin as we used i.e 800 mg.

D. Memis, A. Turan, B. Karamanlioglu, S. Seker and M. Ture compared the effects of gabapentin on arterial pressure and heart rate at induction of anaesthesia and tracheal intubation[12]. Patients receiving placebo (Group I) and 400 mg gabapentin (Group II) showed a significant increase in blood pressure and heart rate associated with tracheal intubation. The results of our study were same as the group receiving 800 mg gabapentin

CONCLUSION

Gabapentin 800mg given orally two hour prior to the induction of anaesthesia shows decreased trend in haemodynamic response to laryngoscopy and tracheal intubation as compared to the placebo

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