ORIGINAL RESEARCH PAPER

Anaesthesiology

KEY WORDS:
Haemodynamic, Laryngoscope, Endotracheal Intubation, Esmolol.

A STUDY OF HAEMODYNAMIC RESPONSE TO LARYNGOSCOPY AND ENDOTRACHEAL INTUBATION WHEN USING ESMOLOL:

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ABSTRACT

Esmolol is an ultra-short acting, β1 cardio selective, β blocking agent with a short half-life (9min). This agent has been used to reduce the increase in heart rate and blood pressure in response to tracheal intubation, thereby reducing the myocardial oxygen demand.(6). This study makes an effort to find the haemodynamic response to laryngoscope and endotracheal intubation using Esmolol.

INTRODUCTION:

Sympathetic innervation viacardioaccelerator fibers from the upper five thoracic segments increase the rhythmicity of sino-atrial node and enhances the rate and force of contraction. The tracheal intubation following laryngoscopy is accompanied by increased sympathetic activity as well as increased sympathoadrenal activity. Increased hypothalamic activity and increased traffic in sympathetic efferent tracts are observed. Release of trophic hormones from hypothalamus stimulates release of ACTH, TSH, GH, FSH, LH, and PROLACTIN in addition to ADH from pituitary.[1,2,3]

Norepinephrine levels may double and epinephrine levels may quadruple from. Surprisingly increase in plasma noradrenaline concentration and mean arterial pressure of upto 100% and 50% respectively can be correlated but correlation does not exist in the post operative period where noradrenaline concentration can increase upto 200% of the basal value. Mu receptors are found in the areas of CNS concerned with cardiovascular response[8,9]. Neurons of this area contain an endogenous opioid enkephalin. Opioid can modulate the afferent impulses at spinal cord and brain stem. They can also modulate the activity of hypothalamopituitary adrenal axis.[4,-7]

Esmolol is an ultra-short acting, β1 cardio selective, β blocking agent with a short half-life (9min). This agent has been used to reduce the increase in heart rate and blood pressure in response to tracheal intubation, thereby reducing the myocardial oxygen demand. This study makes an effort to find the haemodynamic response to laryngoscope and endotracheal intubation using Esmolol.

AIMS AND OBJECTIVES:

To Study the haemodynamic response to laryngoscopy and endotracheal intubation when using Esmolol.

MATERIALS AND METHODS:

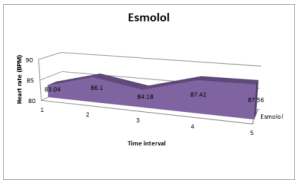
This study was done from September 2018 to August 2019.

This study was done in the Department of Anesthesiology, A.J.Institute of Medical Sciences, Mangalore.

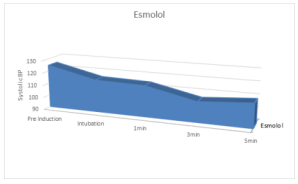
Thirty Patients were allotted for the study.

Patients were evaluated by taking detailed history, physical examination, airway assessment and relevant investigations preoperatively. They were asked to fast overnight. All patients received Inj.Esmolol 2 milligram per kg intravenously 3 minutes prior to laryngoscopy.

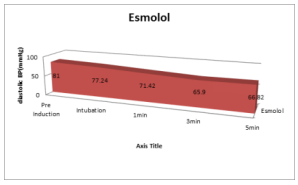
RESULTS:



Heart Rate



Blood Pressure: Systolic



Blood Pressure: Diastolic

DISCUSSION:

Laryngoscopy and endotracheal intubation have become the integral part of general anaesthesia and critical care of patients. It has been practiced since its description by Rowbothom and Magill in 1921.

Laryngoscopy and tracheal intubation are noxious stimuli which provoke a transient but marked sympathetic response manifesting as hypertension and tachycardia. Hypertensive patients are more prone to have significant increase in blood pressure (BP) , whether they have been treated beforehand or not.

Stimulation of mechanoreceptors in the pharyngeal wall, epiglottis, and vocal cords is thought to be the cause for the haemodynamic response. The receptors are abundant over arytenoid cartilage, vocal cords, epiglottis and hypopharynx. Transitory hypertension and tachycardia are probably of no consequence in healthy individuals, but either one or both may be hazardous to those with hypertension, myocardial insufficiency or cerebrovascular diseases. The transient changes can result in potentially deleterious effect like left ventricular failure, pulmonary edema, myocardial ischemia and cerebral haemorrhage.

Numerous studies have been published with different drugs to attenuate this response to laryngoscopy and intubation. In

susceptible patients, particularly those with systemic hypertension, coronary artery disease, cerebrovascular disease and intracranial aneurysm, even these transient changes can result in potentially deleterious effects like left ventricular failure, arrhythmias, myocardial ischaemia, cerebral haemorrhage and rupture of cerebral aneurysm.

Many pharmacological methods have been devised to reduce the extent of these haemodynamic events. These include opioids, local anaesthestics, beta adrenergic blockers and vasodilator drugs.

Beta adrenergic blockers have been used to successfully attenuate this undesirable response to intubation. They act by blocking the effect of the hyperactive sympathetic system on the cardiovascular system. A short acting and cardio selective blocker may be more useful with minimal adverse effects.

Esmolol is an ultra-short acting, 1 cardio selective, blocking agent with a short half-life (9min). This agent has been used to reduce the increase in heart rate and blood pressure in response to tracheal intubation, thereby reducing the myocardial oxygen demand.

CONCLUSION:

1. Esmolol is effective in controlling tachycardia in response to laryngoscopy and endotracheal intubation.
2. Esmolol is effective in controlling the rise in blood pressue as a response to laryngoscopy and endotracheal intubation.

REFERENCES:

1. Liu PL, Gatt S, Gugino LD, Mallampati SR, Covino BG. Esmolol for control of increases in heart rate and blood pressure during tracheal intubation after thiopentone and succinylcholine. Can Anaesth Soc J. 1986;33(5):556–62.
2. Adachi YU, Satomoto M, Higuchi H, Watanabe K. Fentanyl attenuates the hemodynamic response to endotracheal intubation more than the response to laryngoscopy. Anesth Analg. 2002;95(1):233–7, table of contents.
3. Stoelting RK. Circulatory response to laryngoscopy and tracheal intubation with or without prior oropharyngeal viscous lidocaine. Anesth Analg. 1977. 618–21.
4. Kanchi M, Nair HC, Banakal S, Murthy K, Murugesan C. Haemodynamic response to endotracheal intubation in coronary artery disease: Direct versus video laryngoscopy. Indian J Anaesth. 2011;55(3):260–5.
5. Batra Y, Mathew J. Airway management with endotracheal intubation. Indian J Anaesth. 2005;49(4):263–8.
6. King BD, Harris LC, Greifenstein FE, Elder JD, Dripps RD. Reflex circulatory responses to direct laryngoscopy and tracheal intubation performed during general anaesthesia. J New Eng Soc Anaesthesiol. 1951;12:556–66.
7. Ghaus MS, Kumar A, Wahal R, Bhatia VK, Agarwal J. A study of cardiovascular response during laryngoscopy and intubation and their attenuation by ultrashort acting beta blocker esmolol. Indian J Anaesth. 2002;46(2):104–6.
8. Howell SJ, Sear JW, Foëx P. Hypertension, hypertensive heart disease and perioperative cardiac risk. Br J Anaesth. 2004;92(4):570–83.
9. Lars RN, Roth J V, Hug CC, Nagle D. Esmolol Attenuates Hernodynamic Responses during Fentanyl-Pancuronium Anesthesia for Aortocoronary Bypass Surgery. Anesth Analg. 1986;65:451–6.