



OBSERVATIONAL STUDY FOR EFFICACY OF LINGUAL SPRAY OF NITROGLYCERIN IN ATTENUATION OF PRESSOR RESPONSE TO LARYNGOSCOPY AND INTUBATION.

Anaesthesiology

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ABSTRACT

Introduction: Pressor response includes release of norepinephrine from adrenergic nerve terminals and secretion of epinephrine from adrenal medulla. Occurring from 30 seconds after intubation and lasting about 10 mins. Leading to activation of ANS characterised by increase in blood pressure by 40-50% and increase in heart rate by 20% . A transient and unpredictable response is significant in patients with cardiovascular compromise like IHD, cerebrovascular disease ,intracranial aneurysms as it can result in potentially harmful effect like left ventricular failure, pulmonary edema, myocardial ischemia, ventricular dysrhythmias and cerebral haemorrhage.

Aim: To assess efficacy of NTG in attenuating pressor response to laryngoscopy and intubation and To monitor effects like tachycardia, hypotension, headache if any

Methodology: 60 patients posted for different surgical procedures under general anaesthesia of age between 18-65 years were included. Only ASA 1 and 2 and Mallampatti class 1 and 2 patients were chosen . They received 2 metered doses (0.8 mg) NTG spray, 30 sec before induction .Heart rate ,Systolic blood pressure ,Diastolic blood pressure and Mean arterial pressure were monitored at before premedication, Just before induction, Just after induction and 1,3,5,10 minutes after intubation.

Results: Based on above study, Mean and prevalence is calculated and By applying statistical test like repetitive measure ANOVA, Z test, Paired t test we found that lingual spray of NTG in dose of 0.8mg(16mcg/kg) is efficient in attenuating pressor response with P value < 0.01 with minimal side effect.

Conclusion: Study proves that NTG spray in dose of 0.8mg(16mcg/kg) is efficient in attenuating pressor response with minimal side effects.

KEYWORDS

Laryngoscopy, Pressor response, Nitroglycerin, Attenuation

INTRODUCTION:

Pressor response is transient ,variable and unpredictable due to ANS activation. Causes increase in blood pressure by 40-50% and Increase in heart rate by 20%. Starting from 30 seconds lasting upto about 10 mins.

A transient and unpredictable response is significant in patients with cardiovascular compromise like IHD, cerebrovascular disease, intracranial aneurysms as it can result in potentially harmful effect like left ventricular failure, pulmonary edema, myocardial ischemia, ventricular dysarrhythmias and cerebral haemorrhage.

Different methods have been tried to decrease pressor response like Supraglottic airway devices -LMA, Laryngoscopic blades-McCoy ,Pharmacological - intravenous lidocaine, narcotics, calcium channel blocker, vasodilators, β -blockers .

NTG causes vascular smooth muscle relaxation. It can be used -Intranasally as ointment ,Iv as bolus injection ,Iv as infusion ,Spray form.

A desirable and transient hypotension without affecting cardiac output. Preload reduction and accompanying decrease in ventricular end-diastolic pressure reduces myocardial oxygen demand and increases endocardial perfusion by dilating coronary vessels. Because of its predominant venodilatory action best choice in patient with low cardiac output and moderately elevated resistance.

Aims And Objectives:

To assess the efficacy of NTG in attenuating pressor response to laryngoscopy and intubation and to monitor effects like tachycardia, hypotension, headache if any.

Materials And Methods:

Study Design: Observational study
Mode of selection - 60 pts by convenient sampling method.
Study Area: Smt. Kashibai Navale Medical College, Pune
Ethical committee clearance
Study Period: August 2017 to July 2018.

Inclusion Criteria: Either sex , Age 18-65 years ,ASA I & II ,MPC 1 & 2, All patients posted for surgery under GA.

Exclusion Criteria: Patient refusal , Nasotracheal intubation, Abnormal facial anatomy ,If intubation takes more than 30s or more than 1 attempt , Contraindication to use of NTG , Pregnancy, Severe obesity (BMI>35 kg/m²), Ischaemic heart disease, Heart blocks, Cardiac arrhythmias .

Sample Size: 60 pts by convenient sampling method.

Type of study: Observational study

The data was then tabulated, interpreted and conclusions drawn.

ANAESTHESIA PROCEDURE-

Written informed consent was taken. Detailed history and complete preanaesthetic checkup was done. Inside operation room patients was connected to Dräger multiparameter monitor. After 5 minutes of stabilisation in operation theatre baseline heart rate (HR), systolic (SBP), diastolic (DBP), mean arterial pressure (MAP) were recorded . Infusion of ringer lactate (8-10ml/kg) was given before induction. Preoxygenation done and premedication given. Inj Fentanyl 2mcg/kg as analgesic . All patient given lingual spray of NTG 0.8 mg (2 puffs) 30s before induction . Standard procedure of general anaesthesia -Inj Propofol 2 mg/kg iv ,Inj Vecuronium 0.1mg/kg iv, Maintained on O₂, N₂O and sevoflurane on IPPV.

Haemodynamic parameters of patients HR, SBP, DBP and MAP were recorded-Just before induction, after induction, T1 -1 min after intubation , T3 -3 min after intubation , T5 -5 min after intubation , T10-10 min after intubation.

Tachycardia – HR $\geq$ 20% of baseline value, Bradycardia - HR $\leq$ 20% of baseline value, Hypotension - SBP $\leq$ 20% of baseline value, Hypertension –SBP $\geq$ 20% of baseline.

Results:

The Data Obtained From Patients Was Tabulated As Under:

Table No.1: Heart Rate

Time Interval	NTG Group (N=60) (Mean $\pm$ SD)	P value
BEFORE INDUCTION	86.43 $\pm$ 7.06	
AFTER INDUCTION	91.57 $\pm$ 9.82	0.001
T1	94.40 $\pm$ 10.02	<0.001

T3	93.40 ± 9.82	<0.001
T5	97.77 ± 10.04	<0.001
T10	98.13 ± 9.27	<0.001

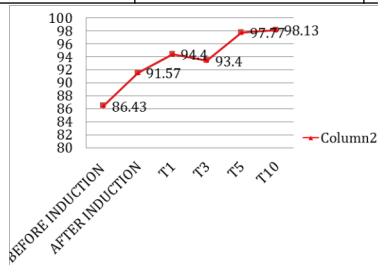


Chart No.1:HR Changes With Time

Table No.2: Systolic Bp

Time Interval	NTG Group (N=60)	P value
	(Mean ± SD)	
PRE INDUCTION	122.97 ± 9.45	
POST INDUCTION	130.02 ± 8.86	<0.001
T1	111.20 ± 8.83	<0.001
T3	110.00 ± 8.13	<0.001
T5	109.10 ± 8.41	<0.001
T10	107.80 ± 8.51	<0.001

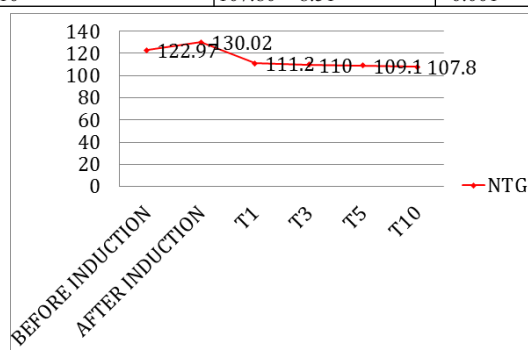


Chart No.2:SBP Changes With Time

Table No.3: Diastolic BP

Time Interval	NTG Group (N=60)	P value
	(Mean ± SD)	
PRE INDUCTION	78.10 ± 10.13	
POST INDUCTION	82.63 ± 7.55	0.006
T1	65.60 ± 7.25	<0.001
T3	63.40 ± 7.17	<0.001
T5	62.00 ± 6.88	<0.001
T10	60.50 ± 6.89	<0.001

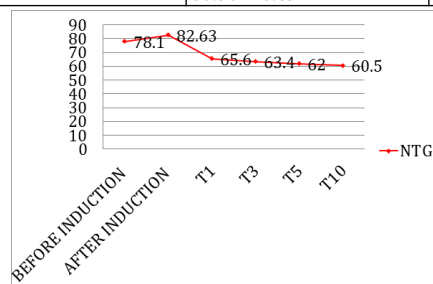


Chart No.3:DBP Changes With Time

Table No.4: Mean Arterial Pressure

Time Interval	NTG Group (N=60)	P value
	(Mean ± SD)	
PRE INDUCTION	93.37 ± 6.59	
POST INDUCTION	95.07 ± 7.14	0.178 (NS)
T1	80.73 ± 6.90	<0.001
T3	78.73 ± 6.54	<0.001
T5	77.37 ± 6.49	<0.001
T10	75.87 ± 6.67	<0.001

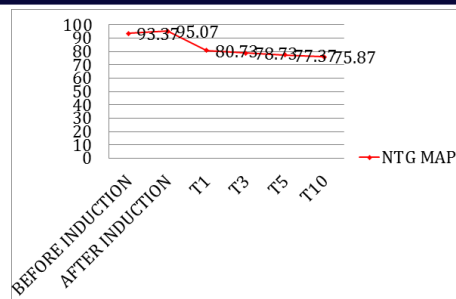


Chart No.4: Map Changes With Time

DISCUSSION:

The magnitude of pressor response can be assessed by observing the rise in HR,SBP,DBP and MAP. NTG spray does not attenuate the rise in HR. Reflex tachycardia produced by vasodilation. NTG spray effectively prevents the rise in BP, however it is associated with statistically significant hypotension persisting for 10 min after intubation.

Though this hypotension was not clinically significant in ASA I & II patients, it would not be acceptable in co-morbid conditions. Indira Kumari et al have also documented NTG is effective in attenuating BP response but it does not attenuate the rise in HR⁽¹⁾. Other studies have reported effective attenuation of pressor response by NTG used intranasally^(3,10), as ointment⁽⁵⁾, intravenously as bolus injection^(2,4,5,11) and infusion.^(12,13) Previous studies^(2,6,7,8,9) have also documented the same.

CONCLUSION:

NTG does not attenuate the rise in HR. NTG spray in dose of 0.8mg(800mcg) given 30s before induction is associated with statistically significant hypotension. Though not clinically significant, we recommend a lower dose of NTG spray.

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