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COMPARISON OF DIFFERENT DOSES OF INTRANASAL NITROGLYCERINE IN ATTENUATION OF PRESSOR RESPONSE TO LARYNGOSCOPY AND INTUBATION

Anesthesiology

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ABSTRACT

Background & aims: Nitroglycerine obtunds the cardiac response to exercise & other stimulation in which sympathetic tone is increased as during intubation.The aim of the study was comparison of different doses of intranasal nitroglycerine in attenuation of pressor response to laryngoscopy & intubation.

METERIAL & METHOD:-In present study 30 cases were taken for each group

1.Group A (n=30)-Patients will received 400 mcg.(Intranasal Nitroglycerine)

2.Group B (n=30)-Patients will received 800 mcg. (Intranasal Nitroglycerine)

3.Group C (n=30)-Patients will received 1200 mcg.(Intranasal Nitroglycerine)

Different doses of intranasal NTG given five minutes before laryngoscopy & intubation.Hemodynamic changes observed till ten min after intubation.

Results:-Results were statistically analysed. All three groups attenuated the pressor response to laryngoscopy & intubation.Significant rise in HR was seen in group C($P<0.05$).Significant fall in SBP, DBP & MAP was observed in group C at 10^{th} min. of laryngoscopy & Intubation.($P<0.05$).

CONCLUSION:-Best result of attenuation of pressor response was seen with 400 and 800 mcg of intranasal NTG. 1200 mcg dose caused maximum increase in HR and caused maximum fall in BP, hence it is advisable to use increased dose with caution in attenuation of pressor response to laryngoscopy and intubation.

KEYWORDS

Intranasal nitroglycerine, Laryngoscopy, intubation, pressor response.

INTRODUCTION: Laryngoscopy and tracheal intubation are noxious stimuli that evoke a transient, but marked sympathetic response manifesting as an increase in heart rate, blood pressure and arrhythmias.

In 1940, Reid and Brace first described hemodynamic response to laryngoscopy and intubation. These changes are well tolerated in ASA I & II patients, but may be fatal with pre-existing hypertension, myocardial ischemia, and cerebral haemorrhage.To blunt this pressor response,various method have been tried.In our study we had compared the effect of different doses of intranasal NTG on attenuation of pressor response during laryngoscopy & intubation. METERIAL & METHOD:-The present study was conducted in a total 90 patients(ASA Grade I & II) posted for elective surgery under GA requiring tracheal intubation.It was undertaken to observe the effect of different doses of intranasal NTG before laryngoscopy & intubation.To compare the HR,SBP,DBP & MAP In three groups treated with different doses of intranasal NTG during laryngoscopy & intubation.Patients were randomly allocated into three groups(30 patients in each group).Doses of intranasal NTG use are 400mcg.(group A), 800mcg(group B) and 1200mcg(group C) treated before laryngoscopy & intubation.Permission was taken from research review board & ethical committee & written informed consent was obtained. Patients belonging to age group of 20-55 year. Exclusion criteria were:-patient refusal, anticipated difficult intubation, pt with HTN, COPD, IHD & arrhythmia, study drug allergy, pregnancy, closed angle glaucoma, increased ICP, severe anaemia, psychiatric dis., hepatic-renal insufficiency.

Table 1 : comparison of mean age(years) of study groups

Group	N	Mean	Std. deviation
NTG-400mcg	30	39.1	9.9
NTG-800mcg	30	38.8	10.9
NTG-1200mcg	30	38.6	10

Table 2 : Sex wise Distribution of study subjects

SEX	NTG-400mcg		NTG-800mcg		NTG-1200mcg		Total	
	N	%	N	%	N	%	N	%
Female	12	40	15	50	14	46.7	41	45.6
Male	18	60	15	50	16	53.3	49	54.4
Total	30	100	30	100	30	100	90	100

Table 3: comparison of mean weight (Kg) of study groups

Group	N	Mean	Std. deviation
NTG-400mcg	30	56.3	8.8
NTG-800mcg	30	54.1	8.8
NTG-1200mcg	30	55.7	8.6

All the patients were properly evaluated preoperatively On arrival in the OT, fasting status, written informed consent and PAC were checked. Data were collected.

Intravenous line was secured, and i.v. fluid R.L was started. Patients were premedicated with inj. ranitidine 50 mg iv.,inj. Glycopyrrolate0.2mg i.v., inj. ondansetron 4 mg iv. and inj.fentanyl 50µgm iv. Data were collected before and 10 minutes after premedication (just prior to nasal spray of study drug). Intranasal NTG was given and then preoxygenation done for 3 min. Data was collected just before intubation. Induction was done with inj. Thiopentonesodium 5mg/kg IV and inj. Scoline 2mg/kg iv followed by direct laryngoscopy and intubation. Inj.Atracurium 0.5mg/kg i.v. loading dose given & Data was collected at 30 sec., 1 min., 1.5min, 2min ,2.5min, 3min,3,5min and then after every 1 min. upto 10 minutes after intubation and anaesthesia was maintained with 60% Nitrous Oxide and 40% Oxygen, 1% isoflurane/sevoflurane and inj. Atracurium0.1 mg/kg i.v. SOS. At the end of the surgery patient was reversed with Inj. Neostigmine (0.05 mg/kg i.v.) and Inj. Glycopyrrolate (0.008mg /kg i.v.)& Extubation was done.

RESULTS

DISCUSSION:HR-In our study, the three groups were comparable in relation to base line heart rate($P>0.05$).After premedication, there was increase in HR in all groups, however there was no significant difference among the group ($P>0.05$). After intubation, the HR was significantly higher in NTG-1200 mcg group and NTG 800 mcg group as compared to NTG 400mcg group ($P<0.001$). There after the HR decreased in all groups, but HR was always highest in NTG-1200 mcg group than in NTG 800 group and lowest in NTG-400 mcg group, and this difference in HR till 10 minutes after intubation was statistically significant at most times ($P<0.05$).

SBP- The mean SBP was not significantly different at baseline ($P>0.05$). After premedication, there was increase in SBP in all groups, however there was no significant difference among the groups

(P>0.05). 30 seconds after intubation, there was significant increase in SBP in all three groups compared to baseline values and the SBP was significantly higher in NTG-1200 mcg group as compared to NTG 800 mcg & NTG 400 mcg (P<0.05). No significant differences was seen among the three groups till 3.5 minutes after intubation (P>0.05). After 4 minutes post intubation there was decrease in SBP in all three groups compare to baseline values but it was significantly lower in NTG-1200 mcg group till 10 minutes after intubation (P<0.001).

DBP- The mean DBP was not significantly different at baseline (P>0.05). After premedication, there was increase in DBP in all groups, however there was no significant difference among the group (P>0.05). After intubation, there was further rise in DBP in all groups, but no significant intergroup difference was seen (>0.05). Then there was gradual decline in DBP in all three groups, but no significant difference was seen among the three groups till 3.5 minutes after intubation (P>0.05). There was still further decrease in DBP in all groups, but the DBP was significantly lower in NTG-1200 mcg group as compared to other groups from 4 to 10 minutes after intubation (P<0.05).

MAP-The mean MAP was not significantly different at baseline (P>0.05). After premedication, there was increase in MAP in all groups, however there was no significant difference among the group (P>0.05). After intubation, there was initial rise in MAP in all three groups followed by gradual decrease in MAP in all groups, but no significant inter group difference was seen till 3.5 minutes after intubation (P>0.05). After 4 min.post intubation there was decrease in MAP in all three groups compare to baseline values but it was significantly lower in NTG 1200 mcg group till 10 min. after intubation (P<0.001).

Table 4: Trend of HR & BP among the study groups

Time point	NTG-400mcg				NTG-800mcg				NTG-1200mcg			
	HR	SBP	DBP	MAP	HR	SBP	DBP	MAP	HR	SBP	DBP	MAP
Before premedication	79.3±10.6	125.7 ± 13.8	77.7 ± 11	93.7 ± 11.5	81± 11.1	123..9 ± 13.6	76 ± 10.4	92 ± 10.9	81.2 ± 10.9	125.6 ± 13	77.7 ± 8.5	93.7 ± 7.8
After premedication	86.8± 9.5	128.5 ± 11.7	78.4 ± 9.3	95.1 ± 9.7	87.8±11.1	125.1 ± 11.5	77.1 ± 10	93.1 ± 9.8	87.2 ± 10.4	128.3 ± 12.5	77.2 ± 7.9	94.2 ± 7.8
After Intubation												
30 sec	96.7± 9.6	128.7 ± 13.8	85.1 ± 10.7	99.7 ± 11.1	102.3± 11.2	131.9 ± 13.6	86.9± 9.2	101.9± 9.9	108.2± 10	139.2 ± 10.2	84.9 ±8.3	103± 7.1
1 min	99.6 ±12	133.3 ± 11.2	86.1± 9.9	101.9 ± 9.8	103.8 ± 11.2	130.3 ± 13	86 ±8.9	100.8± 9.4	109.1 ± 9.5	137.4 ± 9.4	83.6± 8.6	101.6± 7
1.5 min	98.6± 13.0	131.3 ± 11.5	82.1 ± 11.4	98.5± 11	104.2 ± 11	130.2 ± 13.7	81.1 ± 8.2	97.5 ± 9.1	106.1 ± 9	131.5 ± 13.5	84.2± 8	100 ±5.8
2 min	97.6 ±11.3	131 ± 12.8	80.8 ± 11.1	97.5 ± 10.9	103.7± 10.4	125.1 ± 12.8	78 ± 8.9	95.7 ± 9.2	103.9± 8.6	129.4 ± 9.4	76 ± 6.2	99.5± 5.8
2.5 min	96.8 ± 11.6	130.6 ± 12.7	80.4 ± 11.3	96.2 ± 10.9	102.8 ±11.0	124.7 ± 12.9	77.9 ± 8.9	92.5 ± 8.3	103.2 ± 9.1	127.7 ± 10.9	75.7 ± 6.7	98.6 ± 6.4
3 min	92.5± 9.8	128 ± 12.4	78.6 ± 11.5	95.1 ± 10.8	97.4± 9.6	123.9 ± 13.8	76 ± 10.4	92 ± 10.5	99.1± 8.5	120.5 ± 13.5	74.3 ± 8.8	96.4 ± 8.5
3.5 min	92.1 ± 9.9	127.8 ± 12.4	80.5 ± 11.3	96.3 ± 10.5	96.8 ± 9.4	122.2 ± 13.3	74.3 ± 10.4	91.9± 10.1	98.7 ± 7.9	120.4 ± 12.7	72.8 ± 8.6	96.3 ± 8.1
4 min	91.0±13.8	124.8 ± 11.2	77.7 ± 10.6	93.4 ± 9.7	95.1± 9.0	117.1 ± 11.5	70 ± 9.3	85.7 ± 9	95.1± 8.5	116.3 ± 12.9	68.3 ± 9.5	84.3 ± 8
5 min	88.4 ±10.3	123.3 ± 11.5	76.6 ± 10.9	94.1 ± 10	94± 9.0	115.8 ± 12.6	68 ± 9.8	84 ± 9.4	94± 8.1	110.1 ± 12.9	61.5 ± 7.3	77.7 ± 6.9
6 min	84.6 ±9.7	120.8 ± 10.3	70.8 ± 9.3	87.5 ± 8.9	91.1± 9	110 ± 10	64 ± 9	79.4 ± 8.4	91 ± 9.3	109 ± 11.3	60.2 ± 8.6	76.4 ± 7.2
7 min	83.7 ± 9.3	118.5 ± 11.5	68.8 ± 10.4	85.5 ± 9.5	90 ± 8.7	107.9 ± 9.5	62.9 ± 8.7	79.2 ± 7.6	92.0 ±8.1	106.8 ± 10.6	58.3 ± 7.9	73.8 ± 6.7
8 min	82± 9.8	118.5 ± 11.5	66.4 ± 10	83.8 ± 9.3	89.6± 8.7	107.2 ± 8.6	61.3 ± 8.1	76.7 ± 6.6	90.4 ± 8.8	105.6 ± 9.1	57.9 ± 6.6	73.8 ± 5.3
9 min	81± 9.8	116.7 ± 11	63.7 ± 10.6	81.4 ± 9.3	88.5 ± 8.8	107.2 ± 7.6	60.4 ± 7.6	76 ± 5.9	90.5± 8.3	102.9 ± 10.1	57.9 ± 7.9	72.5 ± 6.7
10 min	77.2± 9.3	113.3 ± 12.2	61.8 ± 8.1	79 ± 8.2	85.6± 9	106.6 ± 7.1	57.3 ± 7.1	73.8 ± 5.4	89± 9.4	101.6 ± 9.1	54.5 ± 7.3	70.2 ± 5.9

This coincides with study done by Atul B.Vyas et al 2014 also used different doses of intranasal NTG(400,800 & 1200 mcg) in study groups(60 patients) before laryngoscope & intubation. Data (HR, SBP, DBP, MAP) were collected before and after induction every 1min to till 10 min. Group 3rd showed maximum increase in HR compared to group 1st & 2nd and significant hypotension(SBP,DBP,MAP) IN Group 3rd compared to group 1st & 2nd (P<0.05). **INDIRA KUMARI et al 2016,** also used NTG spray in dose of 400 µgm & 800 µgm (N_1 & N_2 Group respectively) was effective in attenuation of intubation induced hemodynamic response. Incidence of tachycardia was comparable in three groups (70% in control "C" group, 63.33% in group N1 and 67.77% in group N2, P>0.05).Maximum hypotension seen in N_2 Group compared to N_1 & control groups. In our study we found that 1200 µgm intranasal NTG spray caused maximum tachycardia and hypotension after laryngoscopy & intubation.

In our study, we found three doses of intranasal NTG spray(400,800 &1200 µgm.) attenuated the pressor response to laryngoscopy & intubation. There was rise in HR in all the three groups; maximum seen in 1200mcg.group.There was fall in SBP, DBP& MAP in all three groups; maximum fall was seen in1200mcg group after laryngoscopy & intubation.

Best result of attenuation of pressor response to laryngoscopy & intubation was seen with 400 & 800 µgm. Of intranasal NTG spray. As the dose of 1200 µgm. of intranasal NTG spray caused maximum increase in HR & maximum decrease in SBP, DBP &MAP, it is advisable to use it with caution in attenuation of pressor response to laryngoscopy & intubation.

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