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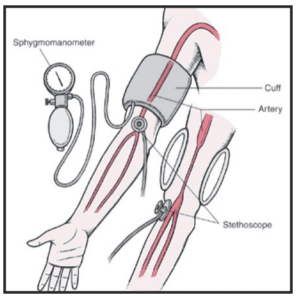
THE EFFECT OF HALOTHANE;
ON BLOOD PRESSURE IN PREMEDICATED AND UNPREMEDICATED PATIENTS



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ABSTRACT... dradeelaslam@hotmail.com **Design:** Comparative study **Setting:** In CMH, Kharian and Nishtar Hospital, Multan. **Period:** From April 2003 to March 2004. **Material & Methods:** We studied 100 patients aged 18-45 years undergoing elective surgery. We compared the effects of halothane in two groups, one premedicated and other unpremedicated on the variability in the blood pressure. Group-I was premedicated with diazepam 5 mg orally and midazolam 7.5 mg orally, aged between 18-45 years undergoing elective surgery. The blood pressure was monitored non-invasively in the ward, in the operation theatre during induction and when halothane is switched on. These groups of patients did not show any significant haemodynamic changes. The blood pressure remained within the normal limits. The second group of fifty patients underwent elective surgery, but they were not given any above mentioned pre-medication, they also belong to same age group. They showed significant haemodynamic changes i.e. rise in blood pressure and beat to beat heart rate variability. This variability was caused by fluctuating balance of sympathetic and parasympathetic tone at the sino-artrial node. Statistical analysis was carried out using student "t" test. Differences were considered significant when P > 0.05 & all values were presented 95 mean (SEM).

Key words Pre-medication, Midazolam, Diazepam, Heart, Blood pressure, Heart rate, Anaesthetic, volatile, halothane.

INTRODUCTION

The heart rate and blood pressure variability is the main hazard for surgical patients specially the elderly and debilitated. Stable cardiovascular system during surgery and postoperatively is the main requirement of anaesthetist to have better outcome. Pre-medication helps in maintaining a stable blood pressure, pulse and other cardiovascular reflexes. Sudden rise or fall in blood pressure can give rise to myocardial infarction, stroke, renal failure, pulmonary oedema and many other dreadful complications. To assess the importance of pre-medication we decided to have a comparative study

between premedicated and unpremedicated patients. The effects of halothane on premedicated and unpremedicated patients were studied.

MATERIAL AND METHOD

We studied 100 patients aged 18-45 years undergoing elective surgery. All the patients belong to ASA-1. The patients were divided into 2 groups of 50 patients each. In both the groups all the patients underwent operating procedure lasting for 30-45 minutes. A day before surgery, base line ECG recording, blood pressure and heart rate frequency measurements were obtained while patients rested in supine position in a quite room. Group-I patients were given midazolam tablet 7.5 mg orally with one sip of water about 90 minutes before operation. Group-II patients were not given any pre-medication. In operation theatre blood pressure was recorded at 5 minutes interval. The heart rate variability and rate pressure product were also recorded. All patients induced with thiopentone sodium 4-6 mg/kg body weight and relaxation was achieved by succinyl choline 1-1.5 mg/kg body weight. Orotracheal intubation was performed and anaesthesia was maintained on nitrous oxide-oxygen and halothane 0.5-0.75%. Relaxation was maintained by tracrium 0.5 mg kg. Neostigmine and atropine were given to neutralize the effect of muscle relaxant.

RESULTS

The two groups of patients we studied had almost identical age, height and weight. Demographic data of patients is given in table-I. All the patients belong to ASA-1 grade. Table-II shows haemodynamic changes i.e. blood pressure and heart rate in premedicated patients. The reading includes blood pressure and heart rate a night before. Table-III show the haemodynamic changes especially in the blood pressure and heart rate in un-premedicated patients on entering the operation theatre, in pre-induction period, after induction and when halothane is switched on. Comparison of both groups shows that there is significant rise in blood pressure and heart rate in unpremedcated group as compared to the premedicated group.

Table I. Demographic data of patients

Group 0I Premedicated	Group II un-premedicated
Age ± 30 years	Age ± 30 years
Sex Male 28 Female 22	Sex Male 24 Female 26
Height (cm) ±65	Height (cm)±60
Weight (kg) 59±2	Weight (kg) 54±3

Table-IV shows comparison of rate and pressure product and this also suggest significant rise on entering the operation theatre in pre-induction period after induction in unpremedicated patients, but in premedicated group there was only slight increase in rate and pressure product. Just after the start of halothane 0.5-0.75% the unpremedicated group of patients showed further increase in blood pressure, heat rate and rate & pressure product. In premedicated group there was no increase in blood pressure, heat rate or rate & pressure product after halothane 0.5-0.75%.Rather there was slight decrease in blood pressure, heart rate and rate pressure product.

Table II. Haemodynamic Parameters Group-I Premedicated

	systolic	Diastolic	Mean BP	Heart Rate
Night before	120±5	70±5	87±5	70±2
Pre-induction	125±3	75±3	92±3	85±1
After induction	125±2	72±2	90±2	80±2
Halothane (inhalation)	110±3	65±2	80±2	65±1

Table III. Haemodynamic Parameters Group - II Un-Premedicated				
	Systolic	Diastolic	Mean BP	Heart Rate
Night before	121±3	72±2	89±2	75±1
Pre-induction	128±2	78±3	95±2	85±1
After induction	135±3	85±2	102±2	90±1
Halothane (inhalation)	142±2	85±3	104±3	128±5

Table IV. Rate Pressure Product		
	Group-I Premedicated	Group-II Premedicated
Night before	120 x 84 = 10080	121 x 75 = 9075
O.T	125 x 85 = 10625	128 x 85 = 10880
Induction	125 x 80 = 10000	135 x 90 = 12150
Halothane	110 x 65 = 7150	142 x 128 = 18176

DISCUSSION

The significant increase in blood pressure and heart rate has been observed in unpremeditated patients undergoing surgery[1].

Preoperative anxiety and tension increases the release of catecholamines from the adrenal medulla[2]. It has been documented that plasma adrenaline level is raised during stress and anxiety. Raised catecholamines increase blood pressure and heart rate in the preoperative period[3,4].

In the patients who were premedicated with midazolam and diazepam, there was no increase in stress and anxiety. So there was no significant increase in blood pressure and heart rate[5].

During anaesthesia, halothane in low concentration increases the blood pressure and heart rate[6]. Further increase is noted in patients who were unpremedicated as compared to the patients who were premedicated. The logical explanation is that halothane sensitizes the myocardium to the raised level of catecholamines[7]. Even with the increase in the concentration of halothane, the blood pressure and heart rate did not drop. The blood pressure increases but not too much due to the peripheral vasodilatation caused by halothane[6]. but the heart rate increased disproportionately. Even upto the end of operation blood pressure and heart rate did not touch the base line.

On the other hand the patients who were premedicated, the inhalational anaesthetic agents did not increase the blood pressure and heart rate[8]. Rather the blood pressure and heart rate decreased proportionally[9]. As in premedicated group patients there is no increase in catecholamine level, so there is no sensitization of myocardium to circulating catecholamines. In these patients, halothane has normal pharmacological depressant effect on the myocardium either through suppression of sympathetic system or through the stimulation of parasympathetic system[6].

By causing peripheral vasodilatation it lowered the peripheral resistance. So in the premedicated patients, both the cardiac output and peripheral resistance decreased. So the blood pressure is lowered proportionally. Both midazolam and diazepam produced alterations in baroreflex activity and decreases in sympathetic activity.

Spectral analysis of heart rate variability permits non-invasive assessment of cardiac sympathetic and para-sympathetic activity. Two major components are seen within a typical heart rate variability spectrum[10]. A high frequency component (0.15-0.5 Hz) mediated by parasympathetic nervous system, and a low frequency

component (0.04-0.15 Hz) mediated by both sympathetic and parasympathetic nervous system. So the low frequency to high frequency ratio is considered to be a useful index of cardiac sympathetic nerve activity. The bispectral index does not correlate with sevoflurane induction[11]. The resting plasma concentration of catecholamines was significantly higher in those patients who were not given midazolam and diazepam. The higher concentration of catecholamines leads to increase in all haemodynamics variable[12].

CONCLUSION

It is concluded from the study that diazepam 5 mg given orally a night before surgery and midazolam 7.5 mg also administered orally about one and half hour before surgery as a premeditated has following advantages:-
The stress response to anxiety and tension is reduced.
There is marked haemodynamic stability.

This is clearly indicated by effect on blood pressure and heat rate.

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