

INCIDENCE OF ACUTE HYPERTENSION WITH SEVOFLURANE AND PROPOFOL DURING LARYNGOSCOPY AND ENDOTRACHEAL INTUBATION IN NORMOTENSIVE PATIENTS

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ABSTRACT:

OBJECTIVES:

The present study was designed to assess the comparison of frequency of acute hypertension with sevoflurane and propofol during laryngoscopy and endotracheal intubation in normotensive patients in general operation theater (OT).

METHODOLOGY:

This was a four months duration cross-sectional study during which a total of 110 patients of both the genders were recruited. The patients were divided into two groups i.e. group A receiving propofol consisted of 30 male and 25 female patients and group B receiving sevoflurane also consisted of 30 male and 25 female patients. Blood pressure (BP) was recorded four times as pre-induction values, T1 (1 minute after laryngoscopy), T2 (3 minutes after laryngoscopy) and T3 (5 minutes after laryngoscopy).

RESULTS:

Pre-induction systolic blood pressure (SBP) was normal in both the groups. The SBP in both the groups A and B were acutely increased in T1 while it decreased in T2 and became normal in T3 in both the groups. Pre-induction diastolic blood pressure (DBP) was normal in both the groups. The DBP was acutely increased in T1, decreased in T2 and became normal in T3 in both the groups.

CONCLUSION:

These results show that both the drugs sevoflurane and propofol can cause severe hypertension soon after laryngoscopy and caution should be taken during laryngoscopy/ endotracheal intubation.

KEYWORDS: Hypertension, Sevoflurane, Propofol, Laryngoscopy, Endotracheal Intubation, Normotensive Patients

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INTRODUCTION:

Hypertension or high blood pressure (HBP) is a long haul ailment where the circulatory strain in the conduits is relentlessly elevated¹. Long haul

hypertension, be that as it may, is a noteworthy hazard factor for coronary course ailment, stroke, cardiovascular breakdown, atrial fibrillation, fringe blood vessel infection, vision misfortune, interminable kidney ailment, and dementia²⁻⁵. Hypertension is named either essential (basic) hypertension or optional hypertension. About 90–95% of cases are essential, characterized as hypertension because of vague way of life and hereditary variables⁶. For most grown-ups, hypertension is available if the resting circulatory strain is constantly at or over 130/80

or 140/90 mmHg^{7,8}. Sevoflurane is with good smell, non-combustible, exceptionally fluorinated methyl isopropyl ether utilized as a sedative through inhalation for enlistment and upkeep of general anesthesia⁹. Sevoflurane is breathed in an analgesic that is regularly used to put youngsters sleeping for medical procedures. During the way toward awakening from the prescription, it has been known to cause tumult and daze. Concerns about the safety of anesthesia are particularly intense with respect to youngsters and newborns and the use of sevoflurane might be toxic to the nervous system¹⁰. Propofol is a short-acting drug that results in a diminished degree of awareness and absence of memory for occasions. Its uses incorporate the beginning and support of general anesthesia, sedation for precisely ventilated grown-ups, and procedural sedation. It is given by infusion into a vein. Greatest impact takes around two minutes to happen and it commonly keeps going five to ten minutes. Propofol isn't a torment medicine and narcotics like morphine may be utilized^{11,12}. Laryngoscopy means assessment of the larynx by diversion of the upper aviation route structures, regularly with the end goal of tracheal intubation in current anesthesia and basic consideration practice just as in numerous injury situations. Endotracheal intubation is a significant and essential advancement during organization of general anesthesia^{13,14}. The present study is designed to measure and compare the acute hypertensive response to laryngoscopy and endotracheal intubation using propofol and sevoflurane as induction agents in both genders and its duration.

METHODOLOGY:

This cross-sectional study was conducted at the general OT of LRH from 1st April 2021 to 31st July 2021. A total of 110 patients of both genders were recruited for this study by calculating the sample size on Rao-soft calculator available online on the basis of 5% significance level and 95% confidence interval. All of the patients were normotensive before the procedure and randomly divided into two groups; group A consisting of 30 males and 25 females received propofol and group B consisting of 30 males and 25 females received sevoflurane. The exclusion criteria for the study was; prediction of difficult intubation, use of intravenous anesthetic agents, use of any sympathomimetic drug during induction, history

of previous hypertension, and patients with cardiac and renal problems. Materials and instruments used in the study included, non-invasive BP machine, pulse oximeter probes, ECG leads, laryngoscope, anesthesia gun, spirit ammonia and I.V. cannula, drugs including propofol, sevoflurane and oxygen supply. Reading of parameters including SBP and DBP was recorded at four different intervals namely pre-induction or baseline value, T₁ (1 minute after laryngoscopy), T₂ (3 minutes after laryngoscopy), and T₃ (5 minutes after laryngoscopy). Data was analyzed using SPSS software version 22. Analysis between the groups was done using one-Way ANOVA while within groups analysis was done using the descriptive statistics frequencies. Continuous variables were described using mean±standard deviation.

RESULTS:

Table 1 shows that both the groups A and B were comparable in terms of demographic data as there were no significant differences between the 2 groups in terms of sex and weight.

Table 1: Demographic Characteristics of Study Participants

Time	Group A	Group B	P-Value
Mean Age (Years)	27.2	27.8	0.672
Male	30	30	1.00
Female	25	25	1.00

The systolic blood pressure of the 2 groups was comparable at induction. At pre- induction, the systolic blood pressure was normal in both groups. After induction (T1) the SBP was rapidly increased up to 25 mmHg in both groups A and B. It was then decreased about 9 mmHg in both groups A and B in T2 and in T3 the SBP further decreased to near baseline values. Between groups comparison revealed no significant difference (Table 2).

Table 2: Mean SBP at Different Times among Group A and Group B

Time	GroupA (Mean±SD)	GroupB (Mean±SD)	P-Value
Pre-induction	121.9±5.4	123.1±4.1	0.198
T1	147.5±4.9	148.3±4.4	0.353
T2	138.5±5.2	139.6±4.8	0.248
T3	123.8±5.7	125.3±4.2	0.107

DBP in the two groups was comparable at baseline. At T1 the DBP increased up to 20 mmHg in both groups A and B. In T2 DBP decreased in both the groups. The decrease was significant in-group A compared to group B. In T3 the DBP further decreased to near baseline values (Table 3).

Table 3: Mean DBP at Different Time Among Group A and Group B

Time	Group A (Mean±SD)	Group B (Mean±SD)	P.Value
Pre-induction	80.1±3.4	80.9±3.0	0.178
T1	98.9±3.3	100.0±3.0	0.076
T2	89.8±3.4	91.6±2.9	0.004
T3	81.1±4.0	81.9±3.5	0.277

DISCUSSION:

The present investigation was carried out to evaluate the recurrence of intense hypertension with sevoflurane and propofol during laryngoscopy and endotracheal intubation in normotensive patients. This investigation shows that intense hypertension with sevoflurane and propofol during laryngoscopy and endotracheal intubation in normotensive patients is reachable. The patients were divided into two groups i.e., Group A and Group B. The systolic circulatory strain of the 2 groups was practically identical at acceptance. At pre-enlistment, the systolic pulse was about typical in the two groups. After

enlistment (T1), the systolic pulse quickly expanded up to 25 mmHg in the two groups A and B. The systolic pulse then gradually decreased to normal in T2 & T3. These findings further strengthen the previous results^{9,15,16}. Propofol is a drug used for general anesthesia and sedation. It is an intravenously used anesthetic agent for unconsciousness after which anesthesia may be maintained using a combination of medications. The action of propofol involves a positive modulation of inhibitory function of the neurotransmitter gamma-amino butyric acid (GABA) through GABA receptors¹⁷. Sevoflurane also called fluoromethyl is an ether inhalation anesthetic agent used for induction and maintenance of general anesthesia during surgical procedures. It induces a reduction in junctional conductance by decreasing gap junctional channel opening times and increasing gap junction channel closing times. It also activates calcium dependent ATPase in the sarcoplasmic reticulum by increasing the fluidity of the lipid membrane¹⁸. In our investigation the diastolic circulatory strain in the two groups was similar at pattern. At pre-acceptance the baseline estimations of diastolic circulatory strain was normal in the two groups. At T1 the diastolic pulse expanded up to 20 mmHg in the two Group A and B, then declined by 9 mmHg in both the groups in T2 and between group comparisons revealed significant differences at T2. In T3 the diastolic pulse reached almost baseline values. We noticed in our study that in both the groups after laryngoscopy, there is an acute rise in SBP and DBP in T1. In T2 this SBP and DBP decreased up to some extent and in T3 it became almost equal to the baseline values. Further we noticed that during T1 and T2, BP was slightly higher in-group B than group A and DBP in T2 was significantly high in group B compared to group A.

CONCLUSION:

We conclude that after laryngoscopy there is an acute rise in blood pressure which means hypertension occurs. Both the drugs sevoflurane were associated with hypertension and we recommend strict monitoring of patients going through laryngoscopy and endotracheal intubation.

CONFLICT OF INTEREST: None

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