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CONTENTS

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Editorial

INFORMATION TECHNOLOGY (IT): MEANS OF IMPROVING PATIENT CARE IN OT & ICU

The information technology immensely influences the medical practice, education and research which include computer system and communication tools. Impact of information technology on medical profession is increasing in the same race as with development of component technologies like processors, memory, network and software. Recently the physicians are becoming more familiar with information technology in applying these tools to their patient management.

Computer

A computer is an electronic device that accepts, processes, stores and then output the data according to programmed instructions. The computer and the information it provide, are being used in the ICU and operation theatre, where the patient's life is at the stake. Like the other specialty, anaesthesiologists also find it very convenient to use computerized devices to serve their purpose. The internet is probably the most reliable source from where much information can be obtained. In most developed countries, the whole medical community has been linked together through broadband and net telephony. The dominant component of the internet is World Wide Web (WWW). The web transmits both text and graphics to a user's computer screen through browsers. Beside web, other forms of communication on the internet continued to be vital in facilitating communication. Electronic mail (e-mail) is text-based form of communication employed by most internet users in a store-and-forward fashion. The protocols and procedures of the operating room and critical care of some leading medical institutions are available on net. The electronic form of Journal and current references are available globally. The online consultation practice is available in developed and some of the developing countries. Now-a-days, the internet has been associated with anaesthesia in various ways. Many web sites have been developed where informations are available about anaesthesia, OT & ICU. But it should be used with caution. Long and inaccurate sitting posture in front of computer may causes deep vein thrombosis and backache.

Cell Phone

Cellular phone improve communication and proved to be effective in updating the medical specialties. The Anaesthesiologists are highly mobile during the working hour. Mobile phone is the best to keep in touch with these busy hospital staffs. It is also beneficial for multi-disciplinary care of the patient in ICU; where a prompt and accurate communication improves outcome of the patients. The patients in the hospital feel lonely and felling of isolation is minimized by talking to the relatives and other family members. Relatives sometimes have relied important information to the other family members. The cell phone in medical scenario includes text messaging to keep in touch with patients about appointments, treatment investigations, regular intake of medicine and preoperative findings for OPD anaesthesia. Cell phone is not without problem. Cell phone-operate with radio frequencies (RF) of 3 kHz – 300 GHz, which is one of the important form of electro-magnetic energy. The radio frequency energy is absorbed in human body at-specific absorption rate. When this absorption level is increased, the patient may suffer from harmful biological effects. Excessive use may cause headache, nausia, dizziness, sleep discomfort and difficulty to concentrate. Mobile phones should not be used in areas, where medical electronic devices are used in patient care like CCU & ICU, HDU, OT, Cath Lab etc. Effect of long term use is not-yet-known. Till to-day, use of the device is considered safe.

Conclusion

Internet and mobile phones have been proved to be patient friendly. The anaesthesiologists and critical care specialists are the best subscribers for these information technologies. The information technology can not solve all the problems but it seems to have a genuine role in the day-to-day medical practice which is now considered to be an integral part of their patient management.

UH Shahera Khatun
Professor & Head, Department of Anaesthesiology
Dhaka Medical College Hospital, Dhaka

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Original Article

ASSESSMENT OF TRACHEAL INTUBATION GRADING

Mir Mahmud Hossain[1], Moniul Hossain[2], AKM Akhtaruzzaman[2], Kazi Mesbahuddin Iqbal[3]

SUMMARY

In this prospective study, one hundred adult patients, fifty in each group were assessed before operation, using the modified mallampati test in Group-A and mallampati & measurement of Thyromental Distance (TMD) in Group-B. The groups were matched for age (P=0.539), Sex (P=0.688), weight (P=0.077), and ASA physical status (P=0.436). Total number of patients facing difficulties during intubation are significantly higher in the Group-A (18 in Group-A and 10 in Group-B) (p =0.001). The measured sensitivity and specificity in Group-A are 65% and 25% respectively. On the other hand, the sensitivity, specificity in Group-B are 75% & 60%. So, the combination of Thyromental Distance and Mallampati test may be done as screening test during preoperative visit which may present fatal consequences of difficult and or failed intubation.

INTRODUCTION

Tracheal intubation is an important maneuver in anaesthesia and in many emergency situations. Every year a good number of patients die as a result of failed tracheal intubation. Poor management of difficult and failed intubation is a significant cause of these anaesthetic morbidity and mortality. The reported incidence of difficult intubation is one in every 65 patients. The incidence of failed intubation is approximately 1 in 2000 in general surgical patient but 1 in 300 in obstetric patients[1]. The Confidential Enquiries into Maternal Deaths indicates that on an average, three healthy pregnant women die each year solely as a result of difficult and /or failed intubation. The Confidential Enquiry into Peri-Operative Deaths (CEPOD) published in 1986 revealed that out of 4034 deaths reported, six were related with difficult or failed intubation. Worldwide, up to 600 people are thought to die each year from difficult and / or failed intubation[1]. But, if prediction can be made at preoperative visit, it will allow the anaesthesiologists to get prepared for this situation which may save many lives. Knowledge of detailed anatomy and development of techniques of intubation are necessary for anticipation of difficult intubation. The best way to predict difficult intubation is direct laryngoscopic examination and grading[2]. But it is not possible to practice in pre-anaesthetic check up room or during bedside examination. The available pre-operative tests which may be used to predict difficult intubation are-Mallampati, Wilson risk score, horizontal length of mandible, mandibulo-hyoid distance, sterno-mental distance[3,4,5]. All are useful to some extent, which have been shown in various studies to have high false-positive value, which detracts from their usefulness. Thyromental Distance (TMD) and other's are useful but the sensitivity, specificity and positive predictive values of these tests are still being studied. Research is still going on to find out bedside simple test to anticipate difficult tracheal intubation. A widely advocated test devised by Mallampati and his colleagues fail to predict all the difficult cases[4,5]. Thyromental Distance, - a method to predict difficult intubation, measures the distance between upper edge of thyroid cartilage to chin with fully extended head. The Thyromental Distance of less than 6.5cm results in less space for the tongue, which is difficult to compressed by the laryngoscope blade for pharyngeal view. Thyromental Distance is relatively unreliable test unless combined with other test[4,5]. So the present study was proposed to assess and compare the specificity and sensitivity of Mallampati test with combined Mallampati test and Thyromental distance to assess the degree of difficulty during tracheal intubation.

PATIENTS & METHODS:

One hundred patients of both sexes requiring assessment for endotracheal intubation before elective surgery of different specialties were

1. Department of Anaesthesia, Analgesia and Intensive Care Medicine, Bangabandhu Sheikh Mujib Medical University
2. Assistant Professor, Department of Analgesia and Intensive Care Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka
3. Chairman, Department of Anaesthesia, Analgesia and Intensive Care Medicine, Bangabandhu Sheikh Mujib Medical University, Dhaka

included in a double blind, randomized study. The protocol was approved by Protocol Review Board of the Department of Anaesthesia, Analgesia and Intensive Care Medicine of BSMMU, Dhaka. The purpose of the study was clearly explained and written informed consent was taken from each patient. Ages of the patients were between 18 to 30 years. The patients unable to understand normal command were excluded, as were patients with known airway abnormality; pathology in the neck, face, pharynx and larynx; injury to head & neck; cardio-respiratory disorders, pregnancy, collagen diseases and full stomach.

All patients were allocated randomly into two groups. Randomisation was done by card samplings. A total of hundred cards, fifty for each group was prepared by another person. Every patient included in the study was allowed to choose a card. According to card number, the patients were grouped.

In Group-A, the modified Malampati test (modified by Samsoon and Young) was performed in the pre-anaesthetic check up room. The patient seating in a chair or stool with a head in neutral position fully opened his or her mouth and protruded the tongue as far as possible. The observer looked from the patient eye level and inspected the pharyngeal structures by pen torch.

In Group-B, a combination of Malampati test was performed and Thyromental distance was measured in each patient. In the pre-anaesthetic check up room the modified Malampati test was performed as it was done in Group-A. Then Thyromental Distance was measured in the same patients from upper edge of thyroid cartilage to chin with head fully extended by a slide calipers. The mallampati class and Thyromental Distance were recorded in a prescribed data collection sheet.

On the day of operation, the patients were anesthetized with intravenous thiopental sodium 3-5 mg/kg and tracheal intubation was performed using intravenous suxamethonium 1.5 mg/kg body weight. The head of the patient was extended and neck flexed on a head pillow or ring and laryngoscopy was done with proper size Macintosh blade and intubation performed. During intubation, intubation condition was observed :

- No difficulty - Tracheal intubation could be done without any aids.
- Moderate difficulty - Needed some aids like pressure on cricoid cartilage.
- Difficulty - Other than pressure on cricoid cartilage, laryngoscopic blade to be changed or stylet to be used, but intubation are to be done in 1 minute.
- Failed intubation - Not possible to intubate with different maneuver.

All intubation was done by Anaesthetic Consultant in the operation theatre who was blinded about the grouping. In case of failed intubation, the patient was allowed to resume spontaneous ventilation and the alternative airway management protocol were followed.

Data were collected in a specially design 'Data collection sheet'. Data were analysed by Chi-square (c^2) and Z test as appropriate using Sigma Plot 11.1. The evaluation of sensitivity, specificity and positive predictive value (the proportion of predicted intubation actually proved difficult) was done with 95% confidence interval. $p< 0.05$ was considered statistically significant (Table-I).

RESULTS

The two groups were statistically matched for age (P=0.539), Sex (P=0.688), weight (P=0.077), and ASA physical status (P=0.436).

Table-I

Patient characteristics

Parameters	Group - A	Group - B	p Value
Age in years	24.06±4.03	24.56±4.06	0.539
Weight in kg	51.76±7.57	49.06±7.65	0.077
Sex			
Male	24(48%)	21(42%)	0.688
Female	26 (52%)	29 (58%)	
ASA physical status			
I	43 (86%)	39 (78%)	0.436
II	7(14%)	11(22%)	

Mean ± SD. In parenthesis are the percentages over column total. Group analyses were done by Chi square (χ^2) test. Values are expressed as significant if P<0.05 (CI-95%.)

During intubation, patients were graded according to Cormack & Lehane grading. In Group-A, 22 (44%) in Grade-1, 21(42%) in Grade-2, 4 (8%) in Grade-3 and 3 (6%) Grade-4. In Group-B, 18 (36%) in Grade-1, 16 (32%) in Grade-2, 13 (26%) in Grade-3 and 3 (6%) in Grade- 4 (Table-II).

Table-II

Distribution of of patients during intubation according to cormack & lehane grading

Groups	Grade-1	Grade-2	Grade-3	Grade-4	P value
Group - A	22 (44%)	21(42%)	04 (8%)	03 (6%)	0.120
Group - B	18 (36%)	16(32%)	13(26%)	03 (6%)	

Values expressed as frequency. In parenthesis are percentages over column total. Data were analysed by χ^2 test. Values are regarded as significant, if p value <0.05 (CI-95%).

In Group-A, 18 (36%) patients were difficult to intubate, though during mallampati test, 07 (14%) were suspected to be difficult. The false negative was 11 (22%). The measured sensitivity and specificity in Group-A are 65% and 25% respectively (Table-III).

Table-III

Relation of preoperative anticipation of difficult intubation with the difficulty durign intubation in Group-A

Number of patient	Suspected to be difficult preoperatively	Difficult intubation	False negative
50	7 (14%)	18 (36%)	11 (22%)

Values are expressed in frequency. Within paranthesis of are the percentage over colum total. Analysis between groups were done for sensitivity & specificity using Z test.

In Group-B, 10 (20%) patients were difficult to intubate, though 16 (32%) patient were suspected to be difficult preoperatively using combination of Malampati test and measring of Thyromental Distence. The false positive were 6 (12%). The sensitivity is 75% & specificity is 60% (Table-IV).

Table-IV

Relation of preoperative anticipation of suspected difficult intubation with the difficulty durign intubation in Group-B

Number of patient	Suspected to be difficult preoperatively	Difficult intubation	False positive
50	16 (32%)	10 (20%)	6 (12%)

Values are expressed in frequency. Within paranthesis of are the percentage over colum total. Analysis between groups were done for sensitivity & specificity using Z test.

Numbers of patient facing difficulty in two groups are displayed in Table-V. Eighteen (36%) patients in Gr-A faced difficulties during intubation, which is significantly higher than the Gr-B (p =0.001).

Table-V

Distribution of difficult intubation in two groups

Groups / Variables	Suspected to be difficult intubation	Difficulty in intubation	P value
Group-A	7 (14%)	18 (36%)	0.001
Group-B	16 (32%)	10 (20%)	

Values are expressed in frequency. Within paranthesis of are the percentage over colum total. Analysis between groups were done for sensitivity & specificity using (χ^2) test. Values are expressed as significant if P<0.05 (CI-95%).

DISCUSSION:

Patient who needs to be intubated must be assessed by screening tests to prevent fatal consequences of the unexpected difficult and / or failed intubation. A screening tests for prediction of difficult intubation are to be very easy, rapid and should give reproducible result. No screening test is absolutely sensitive and 100% specific. Therefore process must be develop to minimize sudden unexpected difficulty during intubation.

Oates JDL and his colleagues found 1.8% incidence of difficult intubation using Mallampati test and Wilson risk score in the preoperative check up room[6]. In our study, Mallampati test on one group compared with combination of Mallampati and Thyromental Distance on another group were used

to assess the degree of difficulty during tracheal intubation and compare the specificity and sensitivity of the two groups. The sensitivity in Group-A (Mallampati alone) is 65% and for Group-B is (Mallampati and TMD measurement) 75%. The measured specificity is also higher in Group-B (25% vs 60%).

Mallampati test is a simple and quick based upon the visible pharyngeal structures when the patient's mouth is wide open. Mallampati and his colleagues described first three classes[7], Samson and Young added later on the fourth one[8]. This test predicts only about 50% of difficulties with a high incidence of false negative results. Mallampati test is significantly affected by inadvertent phonation of patient and there is considerable observers variability[9]. It cannot discriminate the patients of difficult laryngoscopy resulting from limited movement of head and neck. Tham and colleagues showed that the grading observed with the patient in the vertical position did not change when the patient was horizontal; thus the test is useful in an emergency with patient supine or who is unable to sit up[10]. One of the greatest criticisms of mallampati test, however, has been the problem of inter-observer variation[9]. If the posterior pharyngeal wall can be seen below the soft palate, patient is in Grade-I or II, should be predicted 'easy' intubation. If pharyngeal wall can not be seen as in Grade-III & IV and if the TMD of these patient is <6.5 the intubation may be difficult.

In Group-A, where the patient were assessed using mallampati test, 11 (22%) of patients exhibited false negative results that means these patients were difficult to intubate but the preoperative assessment failed to predict any difficulty. A simple bedside test of Patil's Thyromental Distance reflects the degree of head extension on neck along with the position of larynx and length and depth of the mandible. By adding TMD with mallampati test, these false negativity of mallampati test was reduced. In addition, both sensitivity and specificity is higher in Group-B than A. So these two simple bedside tests (Mallampati with TMD) can be performed during routine preoperative visit. The patients having grade III or IV view of the pharynx and the Thyromental Distance less than 6.5 cm. can be expected to have difficultly during tracheal intubation. So, it can be concluded that proper preoperative assessment is mandatory to prevent fatal consequences of the unexpected difficult and / or failed intubation.

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Journal of BSA, Vol. 17, No. 1 & 2, 2004

Case Report

HIGH THORACIC EPIDURAL ANAESTHESIA FOR OFF-PUMP CABG IN A SPONTANEOUSLY BREATHING (CONSCIOUS) PATIENT (ACAB)

Naimul Haque[1], Shahadat Hossain[2], Shahnaz Ferdous[3], NA Kamrul Ahsan[4], Nazmul Hossain[5]

ABSTRACT

A 68 yr old man with ischemic heart disease (IHD) affecting triple vessels was admitted in National Institute of Cardiovascular Diseases & Hospital (NICVD), Dhaka for Coronary artery bypass grafting (CABG). He had been suffering from angina with minimal exercise with mild left ventricular systolic dysfunction. He was also suffering from hypertension and mild obstructive airway disease for the last ten years. He underwent off-pump CABG on beating heart using high thoracic epidural anaesthesia (TEA) without intubation. The patient was awake and breathing spontaneously, tolerated each phase of the operation without having any harmful effect. The effect of movement of the chest wall and the heart during spontaneous respiration did not influence the conduction of the operation. Epidurall catheter was placed at TI-2 interspace, in lateral decubitous position. After a test dose of 2% lignocaine 5ml, 0.5% Bupivacaine 14 ml + Fentanyl 2 µgm/ml was injected epidurally. Central venous catheter was placed under local anaesthesia and inj Morphine 7.5 mg was given intramuscularly. After mid sternotomy left internal mammary artery (LIMA) and venous grafts were anastomozed to coronary arteries on beating heart. Haemodynamically patient was stable throughout the procedure and oxygenation was maintained by assisted facemask ventilation. At the end of operation laryngeal mask airway (LMA) was used for better oxygenation, which was withdrawn one hour later in the postoperative period. After transferring to the ICU, the patient was fully conscious, oriented, responds to commands, capable of coughing and clearing of secretions and pain free. He didn't require any ionotropic support or any systemic analgesic. Postoperative analgesia was maintained by continuous epidural infusionn of local anaesthetic mixture (0.5% Bupivacaine 20 ml + 2% Lignocaine 20 ml + Fentanyl (50µgm) I ml + NS 9 ml= 50 ml) via syringe pump at 1ml /hour. Liquid diet was allowed to the patient from the first POD and epidural analgesia was provided upto the third POD. Patient was shifted to HDU from ICU on the third POD. The patient was highly satisfied about the anaesthetic and operative procedure.

Key words: coronary artery bypass graft, awake coronary artery bypass graft, thoracic epidural anaesthesia, high thoracic epidural anesthesia.

INTRODUCTION

Complete sternotomy is the standard approach in cardiac surgery, and CABG is the most common revascularization procedure using this approach[1]. This standard approach is associated with surgical, anaesthetic, or cardiopulmonary bypass trauma during cardiac operation, which is responsible for increased perioperative morbidity and mortality. Procedures are in continuous development in an effort to minimize the perioperative morbidity and mortality. The current technique of beating heart CABG is intended to decrease the adverse side effects typically associated with cardiopulmonary bypass, resulting in reduction of morbidity and length of hospital stay[2]. High TEA further reduces intraoperative stress and postoperative pain and allows awake coronary artery bypass grafting (ACAB), avoiding the drawbacks of endotracheal general intubation and mechanical ventilation.

1. Professor, Dept. of Anaesthesia, National Institute of Cardiovascular Diseases & Hospital (NICBD), Sher-e-Bangla Nagar, Dhaka
2. Junior Consultant, Dept. of Anaesthesia, NICVD, Dhaka
3. Assistant Professor, Dept. of Anaesthesia, NICVD, Dhaka
4. Professor & Head, Dept. of Cardio-Vascular Surgery, NICVD, Dhaka
5. Associate Professor, Dept. of Cardio-vascular Surgery, NICVD, Dhaka

This new technique is referred to as awake coronary artery bypass grafting (ACAB), was first performed in October 1998 with high thoracic epidural block[3].

This report describes our first experience in performing CABG in an awake patient using high thoracic epidural anaesthesia without intubation.

CASE REPORT

A 68 yr old man with hypertension and triple vessel coronary artery disease (critical stenosis of proximal left anterior descending (LAD) before first diagonal (D_1), right coronary artery (RCA) 70% & circumflex is diffusively diseased & narrow), having angina with minimal exercise (NYHA class III) and mild left ventricular systolic dysfunction (LVEF-45%) with mild obstructive airway disease underwent off-pump CABG using high TEA without intubation. The associated mild obstructive pulmonary disease increased the operative risk..

Thoracic epidural anaesthesia without intubation:

High thoracic epidural anaesthesia was used to achieve somatosensory and motor block between T_{1-8}. The upper permissible level of block C_6 which was monitored by ensuring that the patient didn't present with any symptom compatible with Homer's Syndrome.

One hour before cardiac surgery in the operating room, the patient was placed in left lateral position. Epidural space was identified using 18G(B Braun) Touhy needle at the interspace between T_{1-2} employing the Median approach & the loss of resistance technique using air under local anesthesia (LA). The catheter was directed cranially and advanced 3-4 cm within the epidural space. After confirmation about the correct position of the catheter, 2% Lignocaine-2.5 ml was given as a test dose. After 3-5 minutes of test dose Inj. Bupivacaine 0.5% 14 ml and Fentanyl 2 µgm/ml was injected within the epidural space. After 15 minutes the level of the block was assessed by pinprick and temperature discrimination. The somatosensory and motor block of the intercostal muscles was maintained by continuous infusion of epidural anesthetic solution (Lignocaine 2%-20 ml, + Bupivacaine 0.5%-20 ml + Fentanyl (50 µgm) 1 ml+ NS-9 ml = 50 ml) using syringe pump at 1 ml/ hour, whilst preserving diaphragmatic respiration. Motor block of intercostal muscles was assessed visually by monitoring the loss of intercostal movement. Sensory block was maintained at the CE, Ts level.

Through out the operation, the patient spontaneously breathed $_{02}$ delivered through a Hudson mask. He was draped in such a way that we had free access to the patient's head and neck which would enable us to proceed for immediate tracheal intubation in case of any emergency. No muscle relaxants were used. Continuous monitoring of the patient's condition was done by means of electrocardiography (L-II) with two lead ST analysis and the direct determination of arterial pressure, central venous pressure, and pulse oxymetry & urine output measurement and periodical arterial blood gas analysis.

Off-pump CABG

After a median longitudinal sternotomy incision, the in situ LIMA was anastomozed to LAD using pleural sparing technique. A pericardial traction suture was used to visualize the target coronary artery. The visualization of the anastomotic site was enhanced using a surgical blower. 3 grafts were given- –

LIMA to LAD

RSVG to a diagonal (Dl)

RSVG to Posterior descending artery (PDA).

Right Saphenous vein was harvested by infiltrating 2% lignocaine locally from right lower extremity.

After placement of two chest drainage tubes into the mediastinum , the sternotomy was closed. At the beginning of the operation 5000 IU of heparin were administered for anticoagulation and 7.5 mg of morphine Fm given for analgesia. Sedation was maintained by intravenous infusion of Propofol.

RESULTS

The patient tolerated each phase of the operation very well and he was stable hemodynamically (except during manipulation of the heart when he became moderately hypotensive [BP was decreased upto 65/35 mm of Hg] for some period which was managed by intermittent ephedrine injection). Oxygenation was maintained adequately by diaphragmatic respiration. A moderate accumulation of CO, was noted in ABG analysis (PCO2 was increased upto 50 mm Hg), otherwise no metabolic consequences occurred.

The effect of the movement of the chest wall and the heart during spontaneous respiration didn't influence the conduction of the operation or compromise the quality of anastomosis. At the end of the operation an LMA was introduced under propofol sedation for better oxygenation and it was withdrawn one hour later in postoperative period. The postoperative course of the patient was uneventful. The patient remained haemodynamically stable in ICU. Arterial blood gas and acid-base status remained within acceptable ranges throughout ICU stay. No ECG alterations revealed postoperative necrosis. No neurologic or infectious complications or clinical pulmonary or radiologic alterations occurred. The patient was completely pain free.

DISCUSSION

Endotracheal general anaesthesia and Cardiopulmonary bypass is the usual practice in CABG. Endotracheal general anaesthesia and mechanical ventilation offer an adequate blood gas control, stable haemodynamics and with the relief of anxiety[4].

High TEA provides excellent conditions for off-pump CABG surgery by dilating the coronary arteries and the internal thoracic artery (if the level of block extend to C6) and by reducing heart rate and arrhythmias during manipulation of the heart[2]. Thus, TEA improves the myocardial oxygen demand/supply ratio and consequently reduces perioperative myocardial ischemia. In addition to these intraoperative advances, postoperative pain management is facilitated by continuous epidural application of analgesia. Superior analgesia leads to improved pulmonary function and early ambulation after beating heart surgery consequently in short intensive care requirement. Other potential advantages of high TEA are preservation of fibrinolytic system and the prevention of sustained atrial fibrillation postoperatively[5].

The formation of an epidural hematoma, nerve root compression, ischemia and paralysis after epidural catheter placement in heparinized patient and the bronchospasm due to sympathetic blockade of the bronchial tree were not observed[6,7,8].

Off-pump beating heart surgery significantly decreases the invasiveness of coronary artery bypass grafting. Elimination of cardiopulmonary bypass, small incisions, avoiding aortic manipulation, use of arterial graft etc., have all led to the performance of CABG more efficiently. It also modified the anaesthetic procedure as well-better analgesia, reduced narcotic requirements, wiser drug choice, earlier extubation and an improved respiratory function leading to an earlier ambulationy.

Recently there is a high trend of increasing popularity in other centers abroad high TEA without intubation is used as a sole anaesthetic procedure for off-pump CABG in spontaneously breathing patient.

CONCLUSION

In selected cases, high TEA for off pump CABG in spontaneously breathing conscious (ACAB) patients is feasible & may provide many advantages over the usual practice.

We don't want to advocate the elimination either of endotracheal intubation or GA in routine off pump CABG. Our purpose is to facilitate the learning process towards performing Cardiac surgery in a less invasive way to decrease the perioperative morbidity and mortality.

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Original Article

EFFECT OF HYDROXYETHYL STARCH FOR PRELOADING IN PRE-ECLAMPTIC PATIENTS UNDERGOING CAESAREAN SECTION UNDER SUB-ARACHNOID BLOCK : A COMPARISON WITH HARTMAN'S SOLUTIONS

Md. Shahidul Islam, Abdul Kader, AKM Akhtaruzzaman, KM Iqbal

ABSTRACT

When sub-arachnoid block is performed on pre-eclamptic mother, profound hypotension may occur. To maintain haemodynamic stability, patients can be preloaded with crystalloid or colloid solution. 60 pre-eclamptic pregnant mothers with ASA grade I & II were randomly divided into two equal groups by blind envelop method. In Group-A, patients were preloaded with Hartman's solutions @ 15ml/kg and in Group-B, with 6% Hetastarch @ 5ml/kg. The results of the study showed that hypotension was less in group-B (10%) than group-A (56.66%). Total additional volume of fluid required to treat hypotension was less in Group-B, (803.33ml) than Group-A (1526.66ml). Only three (3) cases of Group-B required ephedrine 0.83±2.65 mg) in comparison to 17 cases of Group-A (4.50±4.79 mg). So, it can be concluded that preloading of pre-eclamptic pregnant mothers with 6% Hetastarch is superior to Hartman's solution in caesarean section after sub-arachnoid block to maintain a stable haemodynamic status.

Key words: HES; Pre-eclampsia; Subarachnoid block;

INTRODUCTION

The pre-eclampsia refers to a triad of hypertension, proteinuria and oedema occurring after 20th week of gestation and resolving within 48 hours after delivery[1]. In pre-eclampsia there is generalised vasoconstriction from elevated thromboxine and exaggerated responses to circulating catecholamines increasing both cardiac output and peripheral vascular resistance and ultimately causing profound hypertension. On the other hand, proteinuria results hypoalbuminaemia causing lowering of colloidal osmotic pressure, oedema and ultimately decreasing the blood volume[2].

The most common problems of pre-eclamptic patient after sub-arachnoid block is rapid on set of profound of hypotension[3]. Sub-arachnoid block lowers blood pressure by dilatation of resistance and capacitance vessels causing reduction in venous return. Hypotension can partially be compensated with vasopressors[4]. But preloading either by crystalloid or colloid also plays an important role in prevention of hypotension.

Crystalloids are aqueous solutions of low molecular weight ions (salts) with or without glucose. It expands the plasma volume less but its intravascular half-life is 20-30 minutes and is rapidly excreted. They rarely cause any side effect[5]. So it may be suitable alternative to maintain blood pressure after sub-arachnoid block.

The pre-eclamptic patients may be related with thrombocytopenia, platelet dysfunction, increased circulating concentration of fibrin degradation product and increased bleeding time[2]. Colloid causes volume for volume expansion exerting oncotic pressure near to that of plasma[3]. It causes less tissue and pulmonary oedema. It has minimal coagulation effect, but some time causes anaphylactoid reactions. Coagulation and bleeding time are generally not affected following 0.5 – 1L infusion of 6% Hetastarch[6]. Considering all the above factors, the present study was performed to compare the haemodynamic effects of Hartman's solution with 6% Hetastarch.

Department of Anaesthesiology, National Institute of Tramatology & Orthopaedic Rehabilitation (NITOR), Sher-e-Bangla Nagar, Dhaka.

MATERIALS AND METHODS

Sixty (60) pre-eclamptic pregnant mothers with ASA physical status I & II were included in a double-blind, randomized study. The approval of the University Ethical Clearance Committee of BSMMU was duly taken before carrying out the study. The purpose of the study was clearly explained and written informed consent was taken from each patient. The patients with history of allergic reaction to colloid, bleeding diathesis, aspirin ingestion in preceding weeks, twin pregnancies, diabetic mothers, patients receiving MgSO4, cardiovascular diseases, febrile and renal impairment were excluded. The patients were divided into two equal groups by blind envelop method. In Group-A, patients were preloaded with Hartman's solution @ 15 ml/kg and in Group-B, patients were pre loaded with 6% Hetastarch @ 5 ml/kg.

The patients were pre-loaded for half an hour with the above fluids. After pre loading Sub arachnoid block were performed at the L3-4 interspaced with the patient in the sitting position. 10 mg of 0.5% hyperbaric bupivacaine, was delivered through a 25 gauge Quincke needle. Immediately after block, the patient was placed in supine position with wedge under right buttock. Urinary catheterisation was done immediately after sub-arachnoid block. The blood pressure (Systolic, Diastolic & Mean arterial pressure) & SpO_2 were measured with an automated non-invasive device (Datex-ohemeda). Readings were recorded in the data collecting sheet.

Hypotension was defined as the systolic blood pressure drops below 100 mmHg or if pressure falls 20-30 mmHg below the pre anaesthetic level. The hypotensive patients were treated with rapid fluid infusion and incremental dose of intravenous ephedrine. After pre-loading, urine output was measured for 24 hours. After delivery of the baby, the mothers were injected with intravenous Oxytocin 5 IU, which was followed by 10 IU in drip. Total volume of additional IV fluid, required during the procedure were also recorded. Blood loss was estimated by measuring blood in suction container and also by weighing surgical mops before and after surgery. Neonatal outcome was assessed using Apgar scores by neonatologist at one and five minutes. Data was compiled on Sigma Plot and analysed by student's t-test with the help of SPSS version 6.0. All results are expressed as mean ±SD. Values were regarded as significant if $p<0.05$.

RESULTS

The two groups were statistically matched for age (p=0.837), weight (p=0.654) and height (p=0.468) (Table-I). Preoperative heart rate in Group-A, ranged between 76-116/min and in Group-B, ranged between 68-104/min. Systolic blood pressure in Group-A, ranged between 105-165 mm Hg and in Group-B between 120-170 mmHg. Mean heart rate in Group-A was 90.63±8.81 and in Group-B was 86.93±10.27, where p=0.139 (Table-II). Mean systolic blood pressure was 137.16±13.81 mmHg in group-A and 141.93±10.27 mmHg in Group-B, where p=0.230 (Fig.-1).

Table-I

Patients characteristics

Variables	Group-A n=30	Group-B n=30	t-value	P-value
Age in year	24.70 ±4.95	24.43 ±5.68	0.205	0.837
Weight in kg	62.96±6.08	63.89±9.47	-0.450	0.654
Height in cm	154.43±3.40	155.20±4.69	-0.729	0.468

Values are expressed as mean ± SD; analysis was done by unpaired student's t-test.
Values were significant if $p<0.05$.

Table II

Heart rate recorded before and after sub Arachnoid block in two groups

Groups	Before SAB		After SAB							
	Br-preload	Br-SAB	3-min	5-min	10-min	15-min	20-min	30-min	45-min	60-min
Group-A n=30	90.66 ±8.81	96.66 ±8.76	95.83 ±12.05	94.26 ±12.11	92.73 ±13.04	90.76 ±13.85	90.80 ±14.58	92.46 ±14.38	89.00 ±10.30	86.96 ±8.94
Group-B n=30	86.93 ±10.27	84.33 ±11.31	86.60 ±10.73	85.30 ±10.00	84.46 ±14.43	86.73 ±14.47	86.86 ±14.59	84.26 ±12.88	84.86 ±9.50	84.73 ±9.73
t	1.496	0.891	-0.263	-0.011	-0.978	1.102	2.105	2.610	1.608	0.635
P	0.139	0.376	0.792	0.990	0.331	0.274	0.039	0.011	0.113	0.527

Values are expressed as mean ± SD; analysis was done by unpaired students t-test.
Values were significant if $p<0.05$.

Heart rate of two studied groups are displayed, where the pre anaesthetic values were not significantly different (p=0.139) in two groups but varied significantly at 20 min (p=0.039) and 30 min (p=0.0 11) after block (Table II). Systolic blood pressure of study groups is displayed in fig-1. Base line systolic blood pressure was not significant (p=o.230) but varied significantly at 5 min (0.000), 10 min (0.003), 15 min (0.000), 20 min (0.000), 45 min (0.000) and 60 min (0.001) after block. Diastolic blood pressure are displayed in table III. Base line diastolic blood pressure was not significant (p=0.209), but varied significantly at 5 min (0.004), 10 min (0.003), 15 min (0.000), 20 min (0.0000), 45 min (0.000) and 60 min (0.000) after block (Table-III). Mean arterial pressure are displayed in Fig-2. Base line mean arterial pressure is not significant (p=0.192), but varied significantly at 5 min (0.002), 10 min (0.000), 20 min (0.000), 30 min (0.000), 45 min (0.000) and 60 min (0.000) after block. After sub-arachnoid block, incidence of hypotension in Group-A was 56.66% and in Group-B was 10%.

The mean additional IV fluid (Ringer's lactate) required to treat hypotension was 1526.66±497.53 ml in Group-A, 803.33±379.00 ml in Group-B. In Group-A, 17 (56.66%) patients developed hypotension. They were treated with additional IV fluid and ephedrine (4.50±4.79 mg). In Group-B, 3 (10%) patients developed hypotension. They were also treated with ephedrine in addition to IV fluid where mean dose of ephedrine was 0.83±2.65 mg. Two patients (6.66%) in Group-A and 4 patients (13.33%) in Group-B were required atropine respectively.

Urine output of the two studied groups was measured for 24 hours after spinal anaesthesia. In Group-A average output was 1273.33±199.45 ml, whereas, in Group-B was 1321.66±150.67 ml. and the different was not significant.

Per-operative blood loss of the two studied groups were measured. In Group-A average loss was 814.66±75.01 ml, whereas, in Group-B was 538.83±103.70 ml ($P<0.005$).

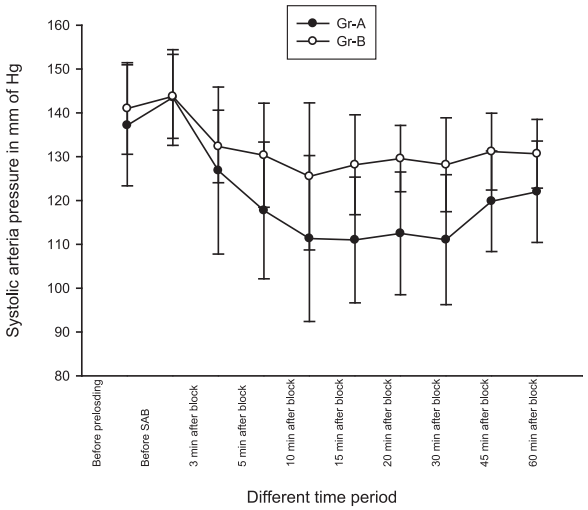

Fig 1: *Changes of Systolic Arterial pressure (mm Hg) at different time in two studied group*

Table III

Changes of diastolic arterial pressure at different time of Sub-arachnoid Block

Groups	Br-preload	Br-SAB	3-min	5-min	10-min	15-min	20-min	30-min	45-min	60-min
Group-A	90.16	90.83	82.76	77.50	74.83	72.66	72.50	78.83	76.83	78.23
n=30	±7.12	±6.30	±12.71	±10.56	±14.82	±11.27	±10.72	±14.50	±8.85	±7.18
Group-B	92.16	92.66	86.83	84.60	83.83	83.56	85.40	84.10	83.83	85.00
n=30	±4.85	±5.20	±5.33	±8.04	±5.97	±9.13	±4.73	±6.39	±6.25	±4.91
t	-1.269	-1.227	-1.615	-2.927	-3.084	-4.115	-6.026	0.555	-3.536	-4.259
P	0.209	0.224	0.111	0.004	0.003	0.000	0.000	0.580	0.000	0.000

Values are expressed as mean ± SD; analysis done by unpaired student's t-test.
Values were significant of P<0.05.

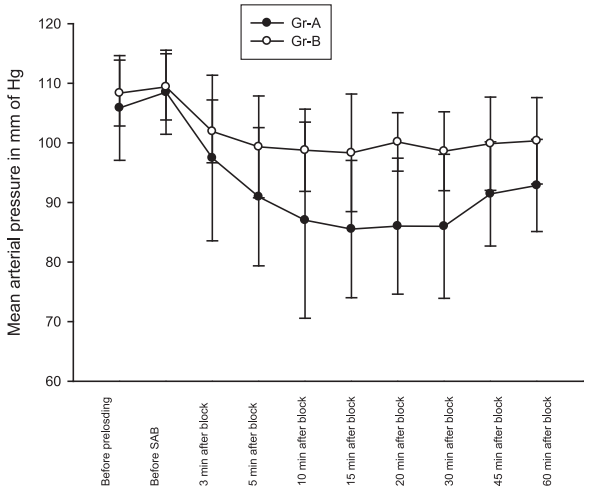

Fig.-2: *Changes of Mean Arterial pressure (mm Hg) at different time in two groups*

DISCUSSION

Pregnancy produces profound physiological changes and affects almost every organ of the body. Many of these physiological changes are adaptive and useful to mother for tolerating stress of pregnancy, labour and delivery. In cardiovascular system, cardiac output and blood volume increase to meet accelerated maternal and foetal metabolic demands[3,7].

In pre-eclampsia as plasma oncotic pressure is lowered and according to Starling's Force, fluids are not reabsorbed from the interstitial space leading to oedema[8]. Spinal anaesthesia causes dilatation of resistance and capacitance vessels, causing venous pooling, which lead to reduce venous return, and marked hypotension. The hypotension can be compensated by preloading either with crystalloid or colloid[3]. In a study, the authors signified the importance of preload where one group receiving no volume load with a group receiving 20 ml/kg over 20 minutes. There was a statistically significant reduction in the incidence of hypotension in the group receiving a volume load (71% vs. 55%)[5].

In our study, 17 cases of Group-A developed hypotension, which is about 56.66% of that study group. On the other hand, only 3 cases of Group-B developed hypotension, which is about 10% of that study population (P=0.001). This is compatible with a study, where 16% hypotension was found in hydroxyethyl starch group and 52% was found in Ringer's lactated group where tubal ligation was done under spinal anaesthesia[9]. In another study a high incidence maternal hypotension was observed during spinal anaesthesia in the crystalloid group (62%) but the incidence was lowered in colloid group (38%)[10].

About 75% of intravenous crystalloid solution diffuses into the interstitial spaces, so that about 3 to 4 times the volume of crystalloid solution is needed to achieve the same degree of blood volume expansion achieved by iso-oncotic solution. Its efficacy in expanding plasma volume is only transient. The dose-response effect of varying amount of crystalloid (10,20 & 30 ml/kg) volume prior to spinal anaesthesia was studied. Maternal colloid osmotic pressure in the 20 and 30 ml/kg groups decreased significantly than the 10-ml/kg groups. They summarised that increasing the amount of intravenous crystalloid volumes to as

much as 30 ml/kg in the healthy parturients do not appear to improve maternal haemodynamics after spinal anaesthesia[11]. So, 6% Hetastarch is more logical choice to preload since they remain in the circulation for a longer time. In another study, lactated Ringer's solution 15 ml/kg was compared with 5% albumin during caesarean section under spinal anaesthesia. The albumin group developed no hypotension, where as hypotension developed in approximately 30% of the crystalloid group. The albumin is expansive and not widely used because of its high cost and less availability[12,13]. The 6% Hydroxyethylstarch exert same colloidal osmotic pressure as plasma, has lower incidence of anaphylactic reactions as compared to other colloids like Dextran and has a better efficacy in preventing venous thrombosis. In our study, the administration of 6% Hydroxyethylstarch was found to be superior to Ringer's Lactate solution in preventing spinal anaesthesia induced hypotension in patients undergoing caesarean section.

In Group-A, 17 (56.66%) cases required vasopressor-ephedrine, (4.50±4.79 mg), where as in Group-B, only 3 (10%) cases required ephedrine to control hypotension (0.83±2.65 mg). In Group-A, additional IV fluid (Ringer's lactate) was required to treat hypotension (1526.66±497.53 ml) where as in Group-B additional fluid was only 803.33±369.04 ml ($P<0.05$). In Group-A, average urine output was 1273.33±199.45 ml, whereas, in Group-B, was 1321.66±150.67 ml. Urinary output in Group-B was better as haemodynamic status was well maintained in this group.

After considering all the above factors, it can concluded that preloading of 6% Hetastarch is superior to Hartman's solution in caesarean section after sub arachnoid block in pre-eclamptic mother to maintain a stable haemodynamic status.

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Original Article

POST-OPERATIVE PULMONARY FUNCTION : A COMPARISON BETWEEN UPPER ABDOMINAL OPEN CHOLECYSTECTOMY AND LAPAROSCOPIC CHOLECYSTECTOMY

Shahnaz Afroza[1], M.M. Masum-Ul- Haque[1], Nibedita Nargis[1], Nezamuddin Ahmed[2], Lutful Aziz[3], KM Iqbal[4]

ABSTRACT:

Postoperative Pulmonary Complications (PPCs) is one of the major cause of perioperative mortality and morbidity in thoracic and upper abdominal surgery. Preoperative risk assessment enables clinicians to reduce perioperative risk in high risk patients.. In upper abdominal surgery, there is a larger alteration in pulmonary functions. This study was performed in 30 patients scheduled for laparoscopic cholecystectomy and for upper abdominal open cholecystectomy. The study revealed that after both laparoscopic & open upper abdominal cholecystectomy there was significant alteration of pulmonary function. There was significant alteration at six hours and after operation which then gradually improved, but it took about 24 hours for its complete recovery. The alteration was more evident in open cholycystectomy. Nevertheless these alterations did not cause any clinical derangement as expressed by SpO_2, HR, & BP. The study also showed a significant dose reduction of opioid in case of laparoscopic cholecystomy. The lung function at postoperative ward correlated well with the level of analgesia. But persistent alteration of pulmonary function indicated presence of other mechanical factors.

***Key Wards**: Surgery-Lap.Cholecystectomy, Surgery-Upper abdominal, Complication-post- Operative, complication-pulmonary, Patient control analgesia*

INTRODUCTION:

Pulmonary Function Tests (PFTs) refer to measurement of a patient's airflow (spirometry), lung volumes and alveolar diffusing capacity. The values vary according to age, height and gender[1,2]. The procedure related postoperative pulmonary complications depend on the site and size of surgical trauma[3]. The risk of postoperative pulmonary complications increase as the incision approaches the diaphragm and when the duration of surgery exceeds 3 hours[3]. In upper abdominal and thoracic surgery, the postoperative pulmonary complications ranged between 10% to 40%[3]. The patients with previously normal lungs suffered impairment of oxygenation for 48 hours after abdominal surgery[3].

Impairment of oxygenation in the postoperative period is related to reduction in FRC. After induction of anesthesia, there is an abrupt decrease in FRC. At postoperative ward, FRC is further deteriorated by wound pain which causes spasm of the respiratory muscles. The supine position also reduces FRC. The reduction in FRC may lead to closing capacity impinging upon the tidal breathing range. This results closure of small airway during normal tidal ventilation. Gas trapping occurs in the affected airways and subsequent absorption of air may lead to the development of small, discrete areas of atelectasis, which are not visible on chest X-Ray. This occurs mainly in the dependent parts of the lung[1].

Open cholecystectomy performed either by sub costal or midline incision might be associated with significant alterations in pulmonary functions. A restrictive breathing pattern with reduced inspiratory capacity is evident immediately after surgery[4]. A shift from abdominal to thoracic breathing occurs because of the reduced

1. Registrar, Department of Anaesthesia and Intensive Care Unit, Apollo Hospitals Dhaka
2. Associate Professor, Dept. of Anaesthesia, Analgesia and Intensive Care Medicine, BSMMU
3. Consultant, Department of Anaesthesia and Intensive Care Unit, Apollo Hospitals Dhaka
4. Consultant-in charge, Dept. of Anaesthesia, Analgesia and Intensive Care Medicine, BSMMU

diaphragmatic contribution to tidal volume[5]. Although the etiology of pulmonary dysfunction after upper abdominal surgery is not completely elucidated but the post operative pain and diaphragmatic dysfunctions are considered to be the major contributing factors[5,6,7].

Laparoscopic surgery is considered as a day case surgery where patients are allowed to go home in the same day or on the next day. The procedure is associated with the multiple puncture of abdominal wall and distension abdominal cavity with CO_2.

This study was designed to compare post-operative pulmonary function after open cholecystectomy with laparoscopic cholecystectomy.

METHODOLOGY

Thirty patients of ASA grade -I and II scheduled for cholecystectomy were included in this study. Patients with any acute chest disease e.g. infection, atelectasis, emphysema, sepsis or any systemic diseases, cardiac and renal failure, patients with chest deformity, extremely old patient and heavy smokers were excluded from the study.

Patients were divided into two groups. Group-A (n=15) = Patient scheduled for laparoscopic cholecystectomy. Group-B (n=15) = Patient scheduled for open cholecystectomy.

The patients were explained the purpose of the study, Spirometric procedure to measure lung function, use of Patient Controlled Analgesia (PCA) device. They were also explained about Visual Analogue Scale (VAS) and Verbal Rating Score (VRS) to assess pain during postoperative period.

In the pre-anaesthetic check up room, haemodynamic status as indicated by heart rate, systolic and diastolic blood pressures were measured. PFTs were also measured by using Spiro meter and the results were recorded.

On the operation table, haemodynamic status was again recorded. After pre-medication with Fentanyl 2μg/kg, anaesthesia was induced with thiopental sodium 3-5 mg/kg. The suxamethonium 1.5 mg/kg was given to facilitate endo-tracheal intubation. Then neuromuscular block was maintained with vecuronium 0.01mg/kg. The anaesthesia was maintained by 70% N_2O in O_2 along with fentanyl given intermittently in every 30 minutes. Half an hour before extubation, ketorolac 0.5mg/kg were given to each patient. At the end of anaesthesia, residual neuromuscular block was antagonized using neostigmine 0.05mg/kg with atropine. The haemodynamic parameters were again recorded.

In the postoperative ward, haemodynamic status were recorded at 10 min. 6 hours & 24 hours operation. The patient controlled analgesia (PCA) device was started immediately after operation. A loading dose of pethidine 0.5mg/kg was given and PCA dose of 10mg with 20 minutes lockout time and 4 hours limiting dose of pethidine 10mg. was fixed. VAS and VRS were recorded immediately after operation & at 1 hour, 6 hours, 12 hour and at 24 hours in the post operative ward. Spirometric pulmonary function expressed as FVC and FEV_1 were recorded at 6 hours and at 24 hours post-operatively. The data was collected in prescribed form and analyzed by student's "t" test and $p<0.05$ was considered as significant.

RESULTS:

The demographic data of the two groups were statistically matched age, sex, body weight and height (Table-1).

Table -I

Patient characteristics of the two groups

Parameter	Group A (n=15)	Group B (n=15)
Age (years)	34.87 ±2.11	42.00 ±2.86
Weight (kg)	56.73 ±2.89	47.40 ±1.99
Height (m)	1.44.20 ±1.28	152.93 ±2.08
Sex Male	2 (13%)	11 (70%)
Female	13 (87%)	4 (27%)

Values are expressed as Mean ± SEM.

*$p<0.05$ (Student's t test).

In Group-A, the FEV_1 measured preoperatively and at 6 & 24 hours after operation, declined significantly ($p < 0.01$) in comparison to preoperative value. At 6 hours, the decline was significant but between 6 to 24 hours, the decline was not statistically significant. Quantitatively the FEV_1 was decreased to 13% at 6 hours and 10% at 24 hours in comparison with preoperative value. The result showed that the most significant alteration was at six hours. There after recovery of PFT was gradual which failed to come at base line even after 24 hours. In Group-B, FEV_1 of the subjects measured preoperatively and at 6 hours and 24 hours in postoperative periods, declined significantly ($p <$

1.01). Quantitatively there was 15% decrease of FEV_1 at 6 hours and 13% decrease at 24 hours in comparison to preoperative value (Fig.-1).

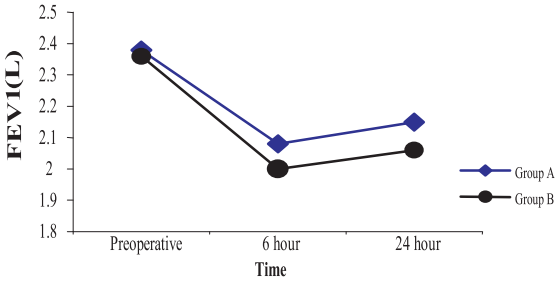

Fig 1. *Changes of Forced Expiratory Volume in 1st second (FEV_1)*

Regarding FVC in both groups, there were similar changes like FEV_1. Again the difference between groups are not significant (Figure-2).

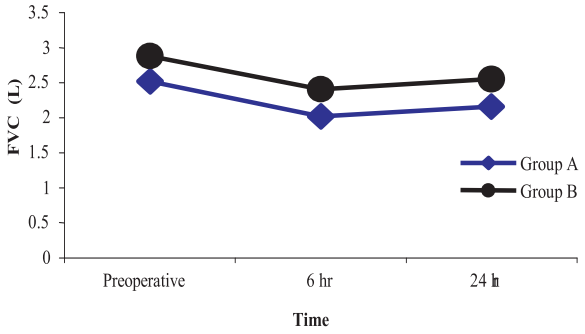

Fig. 2: *Changes in Forced Vital Capacity (FVC)*

The Assessment of pain with Visual Analogue Scale (VAS) and with Visual Rating Scale (VRS) are shown in Table – III & IV which is significantly higher in Group-B than that of Group-A (P <0.001).

Table-II

Haemodynamic values in two groups

Observation	Group A (LC) (n=15)			Group B (OC) (n=15)		
	HR (beats/min)	SBP (mm Hg)	DBP (mm Hg)	HR (beats/min)	SBP (mm Hg)	DBP (mm Hg)
Preoperative	75.33+1.68	121+2.36	71+1.96	78.40+2.21	109+3.53	66+2.66
At extubation	87.00+2.22	125+2.68	80+2.12	83.46+1.81	119+2.41	75+2.13
10 min	80.93+2.01	122+2.53	73+1.27	82.20+2.16	117+2.71	73+1.42
6 hour	73.40+1.22	113+1.58	71+1.58	79.40+0.97	111+2.04	72+2.00
24 hour	75.60+1.39	112+1.41	73+1.05	76.66+1.06	110+1.69	71+1.14

Values are expressed as Mean ± SEM; *P<0.05 (student's 't' test)
SPO_2 of the two groups was similar and maintained at the optimum level.

The Haemodynamic changes were not statistically significant though systolic blood pressure was higher in Group-A than that of Group-B (Table-II).

Table-III

Visual Analogue Scale Pain scores(VAS)

Observation (n = 30)	Group A(LC) (n=15)	Group B(OC) (n=15)
Immediate postoperative (t1)	0.2667 ± 0.1817	1.2000 ± 0.2619
1 hour (t2)	0.4667 ± 0.2153	1.2000 ± 0.2619
6 hour (t3)	0.6000 ± 0.2350	1.2667 ± 0.3446
12 hour (t4)	0.2667 ± 0.1817	1.5333 ± 0.2557
24 hour (t5)	0.0000 ± 0.0000	1.4667 ± 0.2153

Mean ± SEM; *P <0.05 (Student's t test)

Table-IV

Verbal Rating Scale Pain scores(VRS)

Observation (n = 30)	Group A(LC) (n=15)	Group B(OC) (n=15)
Immediate postoperative (t1)	0.0670±0.0660	0.7333±0.1182
1 hour (t2)	0.2000±0.1069	0.5333±0.1333
6 hour (t3)	0.3333±0.1260	0.6000±0.1309
12 hour (t4	0.2000±0.1069	0.7333±0.1182
24 hour (t5)	0.0000±0.0000	1.0000±0.0000

Mean ± SEM; *P <0.05 (Student's t test)

Total dose of opioid used in Group-A were 52.6667 ± 2.6216 mg and in Group -B were 96.8000 + 3.4972 /mg. The difference is statistically significant (P <0.05).

DISCUSSION

The present study showed that the lung functions declined significantly in the postoperative period ($P < 0.01$) in group A in comparison to preoperative value. The maximum decline was at 6 hours after operation. This result was similar to the study of Koba[8]. In group B, the lung function tests also declined ($P<1.01$) significantly. At 6 hours after operation there was statistically significant alteration in comparison to preoperative value ($P < 1.01$).

Results obtained from this study indicated that there was considerable impairment of pulmonary function after laparoscopic cholecystectomy even in healthy patients. The patterns of postoperative alterations were qualitatively similar but quantitatively less than those in open cholecystectomy. In previous observation[9, 10] and non-randomized controlled[4, 11-15] studies, the post operative reduction in FVC, FEV_1 and $FEF_{25\%-75\%}$ ranged from 20% to 40% on the 1st and 2nd post operative day after laparoscopic cholecystectomy and from 40% to 70% after open cholecystectomy in healthy patients. Similar pattern of changes in pulmonary function after laparoscopic and open cholecystectomy was also observed in our study. The small discrepancies may possibly be related to differences in patient selection criteria, duration of anaesthesia and surgery and measurement of different post operative times. However, the most important finding is that laparoscopic cholecystectomy was associated with less impairment of pulmonary function (FEV_1, FVC AND VC) compared with open chocystectomy.

Pain score and analgesic requirement in this study was collected up to 2nd post operative period. This was because most of the patients undergoing laparoscopic Cholecystectomy were discharged from hospital at that time. Decreased pain score and reduced analgesic requirements observed during this period confirmed the clinical observation that laparoscopic cholecystectomy was accompanied by less post operative pain. However, it is not evident if less post operative pain is the only factor responsible for less impairment in pulmonary function after laparoscopic cholecystectomy. The use of opioid analgesic via PCA instrument provided adequate pain relief.

In other studies[16] ABG and post operative atelectasis was also observed which was not done in our study. TLC and RV were also done in the same study[16] which was again not possible in our study due to lack of facilities.

Post-operative alteration in pulmonary function is clinically important if they contribute to respiratory complications. The decrease in FRC has been shown to be correlated well with post operative atelectasis and hypoxemia. Though atelectasis was not excluded in our study but changes of S_PO_2 was observed during the whole time of study which correlate with other observation[16]. Better oxygenation after laparoscopic cholecystectomy compared with open cholecystectomy has been also reported by other authors[11, 13, and 14].

However a extensive study involving a larger group and also measuring other parameters such as ABG(Arterial Blood Gas) and X-ray chest may be under taken to find out whether the patients under going upper abdominal open surgery got any CO_2 retention which might have any reflection over lung function alteration.

In conclusion, it is observed that preoperative PFTs may be influenced by the selection of patients, may be modifed by the approach of the anesthetist. It is also indicated that the need for prophylactic measures preoperatively and in the early postoperative period and may act as an indicator to determine the patients street fitness to go home in respect to their pulmonary function. The study also recommends for optimum pain relief in the post-operative period in an effort to maintain optimum pulmonary function.

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Original Article

PRE-EMPTIVE ANALGESIA : EFFECT OF LOW DOSE KETAMINE AS PRE-EMPTIVE ANALGESIA IN POSTOPERATIVE PAIN MANAGEMENT AFTER LOWER ABDOMINAL SURGERY

Sajjad Ahmed[1], Md. Mozaffer Hossain[2], U H Shahera Khatun[4]

SUMMARY:

A Prospective randomized placebo-controlled study was done at Dhaka Medical College Hospital to evaluate the effects of low dose Ketamine as pre-emptive analgesia in post operative pain management after lower abdominal surgery.

Sixty patients scheduled for elective total abdominal hysterectomy under General Anaesthesia were randomly divided into three equal groups. In Group-A, patients received 0.5 mg/kg ketamine I/V 90 seconds before incision, in Group-B, patients received the same dose after incision and in Group-C, patients were regarded as controlled, received 0.5 ml distilled water before incision.

The patients were premedicated orally by giving Tab. diazepam 5mg with sips of water one hour before induction of anaesthesia. General anaesthesia was induced with thiopental sodium 3-5 mg/kg. Suxamethonium 1.5 mg/kg was given to facilitate endotracheal intubation. The neuromuscular block was continued with vecuronium. Anaesthesia was maintained with N_20 (60-70%) and halothane in 0_2. Halothane was adjusted to maintain the MAP and heart rate within 20% of the pre-induction value. Opioids were not administered during the induction or during the operation. At the end of the anaesthesia, residual neuromuscular block was antagonized with intravenous neostigonine 0.05 mg/kg in atropine 0.02 mg/kg. In the post operative ward following parameters were recorded for 24 hours: recovery status, time of first analgesic demand, pain intensity by VAS & VRS, total opioid consumption, sedation score, haemodynamic status and, complications like nausea, vomiting, delirium and hallucination. Upon the first complaint of moderate pain (>5 on VAS), pethidine 1.5 mg/kg was administered intramuscularly & then repeated 4 hourly. If pain intensity remained >5 on VAS scale, rescue analgesic Pethidine 10 mg was administered intravenously. Time of first demand for analgesic among three groups: Gr- A(pre-incision): 68.4+ 6 min; Gr-B (post-incision): 37.4+ 3.3 min; and Gr-C (Control): 18.9 + 2.1 min. It is statistically significant (P<0.00) i, e, delayed in Gr. A. Total opioid consumption in 24 hours was: Gr. A: 8.6 + 0.11 mg/kg, Gr. B: 9.0 + 0.11 mg/kg and in Gr. C: 9.9 + 0.14 mg/kg. (P<0.00) i , e, less in Gr. A. The incidence of hallucination and delirium were present in Gr. A & Gr. B but more in Gr. B than Gr. A. Nausea and vomiting were present in three groups. So, it can be concluded that pre-emptive use of ketamine significantly reduces postoperative pain and spare opioid consumption in the postoperative pain management.

INTRODUCTION:

The concept of 'preemptive analgesia' suggests that "the best management of postoperative pain begins preoperatively"[1]. It signifies that analgesia, when it is given before the painful stimulus has effects that outlast the presence of the analgesic in the body[2]. The aim of such treatment is to prevent the spinal cord from reaching a hyper excitable state in which it responds excessively to afferent inputs. Experimental evidence suggests that preemptive analgesia can effectively attenuate peripheral and central sensitization to pain[1]. The importance of peripheral and central modulation in nociception has fostered the concept of 'Preemptive Analgesia' in patients undergoing surgery. This may involve infiltration of the wound

1. Anaesthesiologists, Dept. of Anaesthesiology, Dhaka Medical College Hospital, Dhaka
2 Jr. Consultant, Dept. of Anaesthesiology, Dhaka Medical College Hospital, Dhaka.
3 Prof. & Head, Dept. of Anaesthesiology, Dhaka Medical College Hospital, Dhaka.

with local anaesthetic, central neural blockade, administration of effective doses of opioids, NSAIDS or ketamine.

Ketamine as an analgesic gained major attention during last few years as it blocks NMDA receptors. The NMDA receptors are the receptors of pain memory that maintain neuroplasticity and hyperalgia after the end of initial painful stimulus[3].

Many studies on 'preemptive analgesia' were done with ketamine through different routes. But this study was designed to compare the effect of low dose ketamine at two different time e.g. before and after surgical incision with placebo.

MATERIALS AND METHODS:

After obtaining written informed consent, sixty patients aged between 35-55 years with ASA physical status I & II scheduled for elective total abdominal hysterectomy (TAH) under general anaesthesia were recruited in a double blind, placebo-controlled study. The protocol was approved by the ethics committee of DMCH. The patients with history of hypertension, IHD, neurological or psychiatric illness were excluded. The patients were oriented about the Visual Analogue Scale (VAS) and Verbal Rating Score (VRS).The patients were randomly divided into 3 equal groups by card sampling. In Group-A, patients received 0.5mg/kg ketamine I/V 90secs before surgical incision. In Group- B, Patients received 0.5mg/kg ketamine I/V 90secs after surgical incision and Group- C patients were regarded as 'Controlled' and received 0.5ml distilled water 90 sec before incision.

The patients were premedicated with tab. diazepam 5mg with a sip of water 1hr before induction of anaesthesia. Anaesthesia was induced with thiopental sodium 3-5mg/kg. The suxamethonium 1.5mg/kg was given to facilitate endotracheal intubation. Thereafter neuromuscular block was maintained with vecuronium and anaesthesia with nitrous oxide (60-70%) and halothane in oxygen. The halothane was adjusted to maintain the mean arterial pressure and heart rate with in 20% of pre induction value.

At the end of anaesthesia, residural neuromuscular block was antagonized with neostigmine (0.05mg/kg) in atropine (0.02 mg/kg).

Postoperative pain was managed with Pethidine. Upon the first complaint of moderate pain (>5 on VAS), 1.5mg/kg of pethidine was given intra muscularly and then repeated 4 hourly. If the pain intensity remained >5 on VSA scale, rescue analgesic of intravenous Pethidine 10 mg was administered. The pethidine consumption during 0 to 4hr, 4hr to 8hr, and 8hr to 12hr intervals were recorded. In the postoperative period, degree of sedation were assessed with the help of 4 point sedation scoring system. Data was collected in a prescribed form and analyzed by using ANOVA or Chi-Square test as appropriate. Values were regarded as significant if $P< 0.05$ (CL-95%).

RESULT:

Observations of the present study were analyzed in the light of comparison among the groups (Group-A: Pre-incision; Group-B: Post-incision; and Group-C: Placebo Control). All results are expressed as mean ± SD or in frequencies as applicable. The groups were statistically matched for age ($p=0.476$) and weight ($p= 0.465$).

Table-I

Characteristics of the subjects in three groups

Characteristics	Pre-incision group (Group A)	Post-incision group (Group B)	Control (Group C)	p-value
Age in year	43.5±6.0	41.5±4.4	43.4±6.8	0.476
Wight in kg	57.5±10.1	60.6±8.1	57.7±8.1	0.465

Values are expressed as Mean ± SD. Data were analyzed by ANOVA.

Values are regarded as significant if $p <0.05$ (CL- 95%).

Table-II

Time of 1st demand for pethidine and total dose consumed in 24 hours

Background characteristics	Pre-incision (Group-A)	Post-incision (Group-B)	Control (Group-C)	P-value
1st demand (min)	68.4±6.4	37.4±3.3	18.9±2.1	0.001
Pethidine consumption in 24 hrs (mg/kg)	8.6±.11	9.0±.11	9.9±.14	0.001

Values are expressed as Mean±SD. Data were analyzed by ANOVA.
Values are regarded as significant if p <0.05 (CL- 95%) and highly significantly if (P<.001)

First demand for pethidine in three groups (Group-A Pre incision: 68.4 ± 6.4min; Group-B Post incision : 37.4 ± 3.3min and Group-C: Control ;18.9 ± 2.1 min; p= <0.001) are significantly different.

The pethidine consumption in 24 hours postoperatively in 3 groups. (Group-A Pre incision; 8.6 ± 0.11mg/kg: Group-B Post incision; 9.0 ± 0.11mg/kg and Group-C Control; 9.9 ± 0.14mg/kg: p= <0.001) are also significantly different (Table-II).

Table-III shows the heart rate at the different times. it differs significantly at 1hr after induction (p=0.01) and after extubation (p=0.000).

Table-III

Heart rate/min of the patients of three groups at different time

Background characteristics	Pre-incision Group A	Post-incision Group B	Control Group C	p-value
Base line	83.6 ±3.3	84.3± 4.2	83.3 ±3.4	0.500
At Induction	100.6± 8.9	104.4± 7.2	103.6± 8.6	0.320
1hr after induction	82.9± 5.3*	87.6 ±4.9*	86.2 ±4.8*	0.010
After extubation	93.7±3.5*	95.85±3.4*	101±3.4*	0.000
4h after extubation	85.7±3.3	86.6±4.2	85.3±3.4	0.518
8h after extubation	86.6±3.1	89.25±4.6	87.1±3.5	0.070
12h after extubation	85.0±4.5	86.6±4.2	85.3±3.4	0.417
24h after extubation	83.7±3.3	84.6±4.2	83.7±3.5	0.641

Values are expressed as Mean±SD. Data were analyzed by ANOVA.
Values are regarded as significant if * p <0.05 (CL- 95%).

Table-IV

Mean arterial pressure (MAP) in mm of Hg

Characteristics	Pre-incision (group-A)	Post-incision (group-B)	Control (Group-C)	p-value
Base line	90.3 ± 4.0	90.4 ± 4.8	88.9 ± 4.1	0.450
Induction	96.4 ± 4.3	97.6 ± 4.4	96.9 ± 4.4	0.660
1hr after induction	90.2 ± 3.9	93.4 ± 3.2	91.9 ± 4.4	0.135
At Extubation	96.2±3.4	96.7±4.0	98.4±8.1	0.411
4h after extubation	92.2±3.1	92.8±3.8	91.8±4.8	0.667
8h after extubation	93.3±3.3	94.1±4.3	93.6±3.6	0.815
12h after extubation	90.8±4.1	92.3±4.2	91.7±4.5	0.541
24h after extubation	90.3±4.0	90.41±4.8	89.13±4.6	0.601

Values are expressed as Mean±SD. Data were analyzed by ANOVA.
Values are regarded as significant if * p <0.05 (CL- 95%).

Table-IV shows no significant difference in MAP of the patients in three different group at different time.

Pain intensity as measured by VAS was highly significant are at different hour after extubation (Table-V).

The VRS of different groups are significantly different at different hour after extubation (Table-VI).

The sedation Score (SS) are significant different at different hour after extubation Table-VII.

The post operative complications of the different groups are shown in Table-VIII.

Table-V

Visual Analogue Scale (VAS) of the patients of three groups at different hour after extubation

Background characteristics	Pre-incision Group A	Post-incision Group B	Control Group C	p-value
VAS after 4hr	1.2±. 77	2.35±. 93	3.05±. 60	0.000
VAS after 8hr	1.0±. 56	2.2±. 52	2.9±. 55	0.000
VAS after 12hr	1.5±. 69	2.25±. 91	3.55±. 51	0.000
VAS after 24hr	1.25±. 79	2.1±. 31	3.3±. 47	0.000

Values are expressed as Mean±SD. Data were analyzed by ANOVA.
Values are regarded as significant if p <0.05 (CL- 95%).

Table-VI

VRS (Visual Rating Score) of the patients of three groups at different hour after extubation

Background characteristics	Pre-incision group A	Post-incision group B	Control Group C	p-value
VRS after 4hr	0.9±. 45	1.1±. 45	1.6±. 50	0.000
VRS after 8hr	0.85±. 37	1.15±. 49	1.65±. 49	0.000
VRS after 12hr	0.95±. 39	1.25±. 44	1.75±. 44	0.000
VRS after 24hr	0.8±. 41	1.15±. 37	1.75±. 44	0.000

Values are expressed as Mean±SD. Data were analyzed by ANOVA.
Values are regarded as significant if p <0.05 (CL- 95%).

Table-VII

Sedation Score (SS) of the patients of three groups at different hour after extubation

Period	Pre-incision (Group-A)	Post-incision (Group-B)	Control (Group-C)	p-value
SS after 4hr	2.55±.51	2.25±.44	2.15±.37	0.017
SS after 8hr	2.7±.47	2.3±.47	2.15±.37	0.001
SS after 12hr	1.6±.50	1.6±.50	1.25±.44	0.037
SS after 24hr	1.2±.41	1.1±.31	1.00±00	0.112

Values are expressed as Mean±SD. Data were analyzed by ANOVA.
Values are regarded as significant if p <0.05 (CL- 95%) and highly significant if P<0.001.

Table-VIII

Complications (Nausea, Vomiting, Delirium and Hallucination) of the patients of three groups.

Complications	Group	Incidence	F-value	p-value
Nausea	Group-A	8	0.459	0.634
	Group-B	7		
	Group-C	2		
Vomiting	Group-A	2	0.157	0.857
	Group-B	2		
	Group-C	3		
Delirium	Group-A	4	3.595	0.034
	Group-B	6		
	Group-C	1		
Hallucination	Group-A	2	2.280	0.112
	Group-B	4		
	Group-C	0		

Values are expressed as Mean±SD. Data were analyzed by ANOVA.
Values are regarded as significant if $p < 0.05$ (CL-95%)

DISCUSSION:

Preemptive analgesia means - analgesia given before any painful stimulus has effects that outlast the presence of the analgesic in the body[2]. The aim of such treatment is to prevent the spinal cord from reaching a hyper excitable state in which it responds excessively to afferent input[4-5].

In one study, Tverskoy, et al have studied ketamine 2mg/kg as a preemptive analgesic. In their study 95% of the patients were nauseated, hallucination occurred in 89%, and delirium presented in 92%. In our study, the incidence of hallucination and delirium were more in Group A and Group-B, but far less than the study done by Tveskoy. In Group A, four patients (20%) developed delirium, two patient (10%) developed hallucination, eight patients (40%) nauseated and two patient (10%) vomited out of 20 patients. In Group-B, six patients developed delirium (30%), four patients hallucination (20%), seven (35%) patients nauseated and two (10%) patients vomited.

These studies signify, that the side effects like nausea, vomiting, delirium & hallucination were related with ketamine and low dose ketamine is more appropriate for preemptive analgesia.

Our study indicate that the preemptive administration of ketamine markedly decreases the wound hyperalgesia and that this effects outlasts the direct analgesic action of this drug. This results can be regarded as a clinical corroboration of experimental findings of Woolf and Well. who reported that in rat, hyperalgesia produced by electrical stimulation of a c-fibres can be prevented by a relatively low dose of morphine at a time when a much higher dose is required to suppress established hyperalgesia[6]. Our result with ketamine is also compatible with the Woolf and Thompson where preemptive analgesia suppress the NMDA receptors and low dose of analgesic was required for post injury hyperalgesia in rat[7].

Results of this study demonstrated that the addition of low dose ketamine in general anaesthesia delays the first request for analgesic (Group-A, 68.4±6.4 min, Group-B, 37.4±3.3 min and Group-C, 18.9±2.1 min) in the immediate postoperative period. During the first 24 hour total opioid consumption was 9.9±0.14 mg/kg in Group-C where as in Group-A, it was 8.6±0.11 mg/kg and in case of Group-B, it was 9.0±0.11 mg/kg. The difference in consumption is statistically significant ($p < 0.001$). The goals of preemptive analgesia are

at first, to prevent or reduce the development of any "memory" of pain stimulus in the central nervous system and, than to rediced the analgesic requirement[8].

In our study, also indirectly support the goal of preemptive analgesia where first call for analgesic was prolonged and less dose of opioid was required for pain relief.

Considering the findings of our study, it can be concluded that low dose Ketamine (0.5mg/kg) acts as a preemptive analgesia with negligible psychosomatic and cardiovascular side effects.

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Original Article

MIDAZOLAM AND THIOPENTONE AS CO-INDUCTION

Md. Habibur Rahman[1], Mahbub Hassan[2], Md. Monirul Islam[3]

ABSTRACT:

This study was undertaken to compare the induction characteristics of conventional thiopentone sodium, midazolam, and a combination of midazolam and thiopentone sodium as co-induction agent. Total one hundred and fifty patients of ASA grade I and II were divided into three groups in a double blind randomized study. Group-I received midazolam 0.25 mgkg^{-1} intravenously, group–II received thiopentone sodium 5 mgkg^{-1} intravenously and Group-III received midazolam 0.1 mg/kg^{-1} IV followed by thiopentone sodium 2.5 mg/kg^{-1} IV. Induction time was significantly prolonged with midazolam (group-II) compared to thiopentone sodium. The fall in systolic blood pressure (SBP) and diastolic blood pressure (DBP) was clinically insignificant in midazolam group. Induction with midazolam was not smooth and was associated with unwanted movement of limbs. Incidence of apnoea, pain, thrombophlebites were significantly less with midazolam. Co--induction with midazolam and thiopentone significantly reduced the induction time, unwanted movements of limbs, apnoea during induction and cardiovascular stability was also more in co-induction group than thiopenfone sodium group. Incidence and duration of drowsiness was also significantly lesser in co-induction group. These advantages signifies that combination of midazolan and thiopentone is better choice for induction of anaesthesia than the other conventional induction agent like individual midazolam or thiopentone.

INTRODUCTION:

Intra-venous anaesthetic agents are commonly used to induce anaesthesia, as induction is usually more rapid and smoother than inhalational agents. The induction agents available at present are not able to meet all properties of the ideal intravenous anaesthetic agents[1]. Although many drugs have been used and trailed as IV induction agent but only a few drugs have stood the test of time. Of them thiopentone sodium, midazolam, ketamine and propofol are important Thiopentone sodium is the drug, widely accepted for IV induction from long 1935. The advantages of thiopentone include rapid onset, reliability and smoothness of induction. However, recovery with thiopentone is delayed and this is a major disadvantage particularly in out patients anaesthesia, where the patients are expected to ambulate soon after surgery.

Ketamine has the advantage of good tissue tolerability and can be used either by intramuscular or intravenous routes. But it produces hypertonous, hypertension and emergence delirium and delayed recovery. Propofol is short acting with rapid onset and absence of excitatory effects. Beside these, there is a clear-headed recovery with this drug, which is very helpful for outpatient procedure. Pain on injection is a disadvantage. However, it is quite popular for induction and maintenance for short surgical procedures[2].

Midazolam hydrochloride an imidazole - benzodiazepine derivative synthesized in 1976 and was introduced into anaesthesia practice in 1981 as a water-soluble benzodiazepine with short duration of action[3]. This drug is now gaining popularity as an induction agent because of its smooth induction and less cardiovascular and other side effects. Induction time with midazolam has been reported to vary from 30 second to 2.55 minutes in various studies[4-5]. Pre-medication reduces induction time.

Midazolam acts synergistically with barbiturate, opioids, propofol. Induction dose of each of these agents can be lowered by 75% when it is combined

1. Associate Professor (C.C) Dept. of Anaesthesia, SBMC, Barisal
2. Professor (C.C) Dept. of Anaesthesia, Mymensingh Medical College.
3. Assistant Professor, BIRDEM, Medical College, Dhaka.

with other induction agents[6]. We conducted a study, where induction characteristics of thiopentone, midazolam and combination of midazolam with thiopentone as a co-induction were compared to find out better induction characteristics of anaesthesia.

MATERIALS AND METHODS:

The study was conducted at Sher-e-Bangla Medical College Hospital, Barisal after taking approval from local ethics committee. One hundred fifty patients scheduled for surgical procedures of about one hour duration were selected for study in prospective randomized manner. Patients of either sex, aged between 20-50 years and ASA grade I and II, were included after obtaining informed consent. Patients with severe cardiac, respiratory, hepatic and renal disease; pregnant patient and lactating mother were excluded. Patients with History of drug abuse, alcohol intake and psychotic disorder were also excluded from the study.

Patients were divided randomly into three groups. In Group-I, patients received thiopentone 5 mg kg^{-1}, Group-II, midazolam 0.25 mg kg^{-1} and Group-III, midazolam 0.125 mg kg^{-1} followed by thiopentone 2.5 mg kg^{-1} body weight.

An 18 gauge IV canula was inserted into the vein on the dorsum of the non-dominant hand. On arrival in the operation theater, base line blood pressure, heart rate, and oxygen saturation were recorded. An 20 gauge IV canula was also introduced into a suitable peripheral vein. The canula site was marked for later identification. Patients were continuously monitored for oxygen saturation, ECG and NIBP. Anaesthesia was induced with the alove drugs.

Time taken for loss of eyelash reflex was noted as the induction time. After induction, oxygen 6 L min^{-1} was given through a bain circuit. Tracheal intubation was facilitated with suxamethonium 1.5 $mgkg^{-1}$ and anaesthesia was maintained with a mixture of 60% N_20 and 0.5% halothane in oxygen. The blood pressure and heart rate were recorded at induction and at one minute, two minutes, 8 minutes of induction and at the end of operation. The patient were also observed at the post-operative ward for any complications like apnoea, desaturation, pain at the site of injection, urticaria, thrombophlebitis through the course of vein. Post-operative drowsiness was assessed on a four points scale:

O = Awake
I = Sedated but easily rousable on verbal commands.
II = Sedated but rousable on shaking or painful stimuli
III = Deeply sedated.

Reading were taken every 15 minutes for sedation in the post operative period and time taken to be widely awake (score-0) was noted. At the end of surgery, intavenous canula, which and was used for drug administration was removed. The site was checked for signs of any thrombophlebils after 24 hours. The results were statistically analysed by using students 't' test & Chi-square test.

RESULT

Demographic data is shown in Table-I. Age, sex, weight, ASA grade, induction time and duration of anaesthesia were comparable among all groups. The induction time of Group-I, Group-II & Group-III were 17.8+8.1 (Mean+SD) second (sec) 75.2+42.5 sec. and 35.5 ± 10.3 sec. respectively.

Statistical analysis revealed that induction time of midazolam (Group-II) was significantly longer than thiopentone (Group-I). But in Group-III (co-induction group), induction time was significantly shorter than midazolam (Group-II).

Table-I

Demographic data and induction time

	Group I	Group II	Group III
No. of patients (n)	50	50	50
Age (years)	36.5±12.6	38±13.1	34.3±11.5
Sex (M: F)	28:22	24:26	30:20
Weight (kg)	55.7±10.0	54.0±9.9	52±11.2
ASA grade (I : II)	40:10	38:12	42:8
Induction time (Sec)	17.8±8.1	75.2±42.5	35.5±10.3
Duration of Anaesthesia (min)	111.4±45	120.5±42.8	111.9±40.C

Mean ± SD, P <0.05 is considered significant

Table-II

Blood pressure and heart rate

Group	Parameter	Pre-induction	1 min—I min.	2 min.	8 min
I	SBP	126.9±13.8	112.5±14.5	111.3±15.6	118.5±5.9
	DBP	76.7±7.3	70.4±12.6	67.4±11.2	76.1±.2
	HR	80.8±10.7	10.6±13.1	111.5±12.3	92.3±1.6
II	SBP	115.2±12.2	110.5±12.9	109.9±9.4	114.1±2.5
	DBP	71.7±11.9	69.2±9.5	68.4±11.2	70.2±1.8
	HR	81.5±10.3	96.7±13.5	99.6±11.7	83.2±2.1
III	SBP	112.0±15.3	115.9±14:3	106±4.5	110±0.9
	DBP	78.4±11.8	70.4±12.9	70.5±1.4	77.2±1.1
	HR	86.5±12.9	94.2±11.4	97.5±2.9	87.9±2.4

Mean ± SD, P <0.05 is considered significant

SBP = System blood pressure, DBP = Diastolic blood pressure, HR = Heart rate

2 minute after induction of anaesthesia in Group-I, systolic blood pressure decreased to 111.3±15.6 mmHg from base line value of 126.9±13.8 mmHg. Reduction of BP was about 12%. In Group-II, SBP decreased from 115.2±12.2 mmHg to a minimum of 109.9±9.4 mmHg in the same period. Reduction of BP was about 4%. In Group III, SBP decreased from 112±15.3 to 106±14.5 (a reduction of 5%). In all these groups, fall in blood pressure were significant but fall is greater with thiopentone. Two min (2) after induction of anaesthesia, heart rate was seen to increase in all groups. But this increase was more prominent in thiopentone group.

Table-III

Adverse effects observed during induction

Group	Group-I	Group-II	Group-III
Redness	8(16%)	0	2(4%)
Pain at the site of inj.	7(14%)	01(2%)	2(4%)
Movement of limbs	2(4%)	22(44%)	5(10%)
Apnoea	19(38%)	6(12%)	8(16%)
Destruction	5(8%)	8(16%)	2(4%)
Dysrrhythmias	3(6%)	1(2%)	0
Cough	4(8%)	0	1(2%)

The incidence of redness was higher in Group-I (P<0.05). On the other hand none of the patient in Group-II had any incidence of redness. Pain at the site of injection was seen also higher in Group – I than other two groups. The high incidence of movement of limbs was seen midazolam group (Group – II) which was lowest in Group-I. The incidence of apnoea was significantly higher in thiopertone group (Group-I) compared to midazolam and co-induction groups. Drowsiness during postoperative period was higher (23) in Group-I, but it was lower in Group – III. Headache or heavy headedness was seen in 23 patients (46%) in Group-I; but it was vary low in midazolam & co-induction group. Postoperative nausea vomiting (PONV) was very high in thiopentone group than the other 2 groups. Thrombophlebites was seen in 3(6%) patients in Group I; and only 1(2%) patients in Group-III.

Table-IV

Postoperative characteristics

Characteristic	Group -I	Group -II	Group -IIII
Drowsiness	23(46%)	14(28%)	9(18%)
Headache	23(46%)	3(6%)	2(4%)
Nausea and vomiting (PONV)	15(30%)	6(12%)	5(10%)
Desaturation	2(4%)	0	0
Thrombophlebites	3(6%)	0	1(2%)

PONV = Postoperative nausea and vomiting

DISCUSSION:

It is well established that thiopentone sodium causes induction in one arm-brain circulating time[2]. The rapidity of induction is related to the dose, pre-medication, age of the patient and associated medical problems[6-7]. The induction time with midazolam was longer and there was wide variation of induction period among the patients. Berggren, et al (1981) evaluated midazolam in a dose of 0.36 $mgkg^{-1}$ and found that induction time was considerably longer (82.3±6.10 sec) in midazolam group than thiopentone group (45.9+1.7 sec)[8]. Al-Khudhairi found that mean induction time with midazolam (0.3mgkg-1) to be 30 sec. (ranges 12-45 sec) but the patients were premedicated with papavarine, hyoscine and droperidol one hour before surgery[4]. In our study, induction time was significantly shorter in co-induction group (Group-III) than the midazolam group, though it was longer than thiopentone group.

Crawford, et al found the mean induction time for midazolam to be 40 seconds where the patients were premeditated 30 minutes before induction with droperidol (5mg kg^{-1}) [9].

In our study, heart rate was increased by 30-40% in thiopentone induction, 15--20% in midazolan and co-induction groups. The fall in systolic and diastolic blood pressure at the end of 2 minutes was significant. Foster, et al[11] studied the haemadynamic affect of midazalam 0.15 mg kg^{-1} over 15 sec which produced statistically significant fall in systolic (57%) and diastolic (10%) blood pressure and increase in heart rate[10]. In Group-III, increase in heart rate and fall in blood pressure was minimum. The reduction in systemic vascular resistance may increase heart rate as a compensatory mechanism. This may be the main reason for thiopentone to produce a greater increase in heart rate[11].

Occurrence of redness and pain at the injection site in thiopentone group was significantly higher ($p<0.05$) than co-induction group (only 2 patients). Signs of thrombophlebites was seen in three patients of thiopentone induction but no patient developed thrombophlebitis in midazolam group. Only one patient in co-induction group developed signs of thrombophebites which was significantly less than thiopentone induction. Incidence of coughing was more in thiopentone group, which was absent with midazolam induction. Movement of limbs was more in midazolam group where as, limb movement was seen only in 2 patients (4%) in thiopantione group. The incidence was much less in co-induction group than midazolam induction. Higher incidence of movement of limbs was probably because of slower induction with midazolam or inadequate dose of midazolam used for induction[10].

A short period of apnoea developed in 19 patients (38%) in Group-I. The incidence was much less in midazolam and in co-induction group. The incidence of midazolam-induced apnoea in literature is more than we observed (18 to 78%)[12]. The incidence of post-operative nausea and vomiting (PONV) was more in thiopentone group, 15 (30%). It was seen in 6 patients (12%) in midazolam and 5 patients (10%) in co-induction group. Post-operative nausea and vomiting is a very common problem with an incidence of 3.6 to 85%[13]. In our study it was between 5% to 15%.

CONCLUSION

To conclude, midazolam when used in 0.25 $mgkg^{-1}$ body weight, takes significantly longer time for induction and the incidence of limb movement is higher. Induction with thiopurtonce is related with a significant change in cardiovascular parameters. Co-induction with midazolam and thiopentone in a reduced dose of each drug can shorter induction time and can reduce limb movements during induction. Recovery from anaesthesia was better with co-induction than thiopentone or midazolam. So, co-induction with midazolam-thiopentone can be a better choice than the indivudial indication agent like thiopentone or midazolam.

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Original Article

FOETO-MATERNAL OUTCOME IN PRE-ECLAMPTIC PARTURIENT UNDERGOING CAESAREAN SECTION - INFLUENCE OF PRE-OPERATIVE CONTROL OF BLOOD PRESSURE

M Mozaffer Hossain, AKM Akhtaruzzaman, Hasina Begum, Niaz Ahmed, M Khalilur Rahman

ABSTRACT

The foeto-maternal out come in pre-eclamptic parturients under going caesarean section under SAB with or without pre-operative control of blood pressure were studied. A total of 60, 30 in each group primpara women with singleton pregnancy diagnosed as pre-eclampsia scheduled for caesarean section were included. In Group-A, patients were treated with Hydralazine 5mg increment dose at 20 min. intervals till the DBP at or below 90 mm Hg. In Group-B, patients did not receive any anti hypertensive therapy. The patients were pre-loaded in both groups with lactated Ringer's solution at 15ml/kg over 20-30 minutes. The SBP, DBP and heart rate were recorded before block, just after block, every two minutes for 1st 10 minutes and then every five minutes till on arrival of post operative ward. Neonatal assessment was done using APGAR score at 1 and 5 minutes.

There was no significant changes of SBP between the groups throughout the study period. But there was significant difference in intra-operative fluid requirement in two groups (478 ml vs. 635m1;; P=0.0001). The Ephedrine requirements were almost similar in two groups. There was no significant differences of APGAR scores in two groups. This study gave the understanding that pre-operative control of BP of mildly pre-eclamptic parturient is not mandatory for caesarean section under spinal anaesthesia.

INTRODUCTION

Pre-eclampsia is a hypertensive disorder in late pregnancy commences after 20th week of gestation and resolves shortly after delivery[1]. It occurs up to 10% of all pregnancies and is a major cause of maternal and foetal morbidity and mortality[2]. The triad of pre-eclampsia includes hypertension, proteinuria and oedema.

The definitive treatment of pre-eclampsia and eclampsia is delivery of foetus and placenta[1]. Severely pre-eclamptic parturient is associated with varying degrees of intra-vascular volume contraction. For one of the reason, the use of spinal anaesthesia in emergency situations, in which it might be of greatest benefit to pre-eclamptic women in avoiding the need for general anesthesia, may be limited by the time available to preloading the patient.

The use of subarachnoid block for cesarean delivery has been increasing in the developing countries like Bangladesh. It is cost-effective in comparison to epidural block. Nonetheless, epidural anesthesia is preferred for cesarean delivery as the severity and incidence of hypotension is less due to a slower onset of sympathetic blockade. Hood and Curry present the results of a retrospective chart review, comparing the effects of spinal and epidural anesthesia for cesarean delivery in severely pre-eclamptic women. On the other hand, when the caesarean section is indicated a large number of pre-eclamptic mother remain hypertensive inspite of on going antihypertensive treatment. Beside this, some patients also come without treatment which may require emergency caesarean section. Then the question arises wheather for preoperative control of blood pressure before subarachnoid block

Address of correspondence: Dr. M Mozaffer Hossain, Consultant Anaesthesiologist, Department of Anaesthesiology, Dhaka Medical College Hospital, Dhaka-1000; Email: mili@bol-online.com

is necessary or not? The aim of the present study was to investigate the foetomaternal outcome with or without preoperative control of blood pressure in pre eclamptic parturients.

MATERIALS AND METHODS:

After informed written consent, a total of sixty, thirty in each group, primipara women with singleton pregnancy diagnosed as pre-eclampsia scheduled for elective caesarean section were included in the present study. Ethical clearance from Dhaka Medical College Hospital Authority was also obtained. 30 pre-eclamptic mother treated with anti-hypertensive therapy were included in Gr-A. Another 30 pre-eclamptic mother without anti-hypertensive treatment were included in Gr-B. The pre-eclamptic mother with coagulopathy, other obstetrics complications, weight of more than 70 kg were excluded from the study. After recruitment, the parturients of Group-A were treated with Hydralazine. The drug was given intravenously at incremental dose of 5mg, at twenty minutes interval till the diastolic blood pressure at or below 90mm of Hg. The parturients of Group-B did not receive any anti-hypertensive therapy.

On entry to the operating theatre, a monitor (Datex-Ohmeda S/5) was attached with the parturients for continuous monitoring of electrocardiogram, systolic, diastolic and mean arterial blood pressure and SpO_2. The patient was preloaded with Lactated Ringer's solution at 15ml/kg body weight over 20-30 minutes. With the parturient in left lateral position, sub-arachnoid block was performed using 25G Quincke-Babcock Lumber puncture needle at L2-3 or L3-4 interspace. 10-11mg of 0.5% hyperbaric bupivacaine was delivered into the sub-arachnoid space after free flow of cerebrospinal fluid through the needle. The needle was withdrawn and the parturient was immediately positioned supine with left lateral tilt.

The heart rate, blood pressure and SpO_2 were recorded before block, just after block, every two minutes for first ten minutes and then every five minutes till surgical procedure was completed and on arrival at the post-operative ward. Hypotension was defined as systolic blood pressure decreased below 100mm of Hg or more than 20% reduction from pre-block state and was treated with IV fluid and Ephedrine. Total amount of fluid and ephedrine were also noted. The patients received supplemental O_2 through nasal prong @ 2L/min during surgery. Neonatal assessment was done using APGAR score in one and five minutes by a neonatologist who was blinded about the study.

The results were compiled and analysed statistically using student's t and chi-square test as appropriate with the help of statistical programme Sigma Plot version 6. Values were considered as significant if $p < 0.05$ (CL-95%).

RESULTS:

The demographic data are displayed in Table-1. There is no significant difference in age (p=0.94), body weight (p=0.32), height (p=0.23) and duration of pregnancy (p=0.77) of the parturients.

Table-I

Demographic characteristics of parturient in two groups

Parameters	Group-A	Group-B	P value
	30	30	
Age in years	23.93±2.44	23.96±2.09	0.94
Body weight in kg	65.53±4.5	66.73±4.7	0.32
Height in cm	156.96±3.0	156.80±3.66	0.23
Duration of pregnancy in weeks	35.13±1.33	35.03±0.98	0.77

Values are expressed as mean ± SD. Data was analysed using unpaired student's t test. Values are expressed as significant if $p < 0.05$ (CL-95%).

Table-II

Total Intravenous fluid used in two groups

Fluid used in different time period	Group-A	Group-B	P value
Amount of fluid used as preload (ml)	945±51	965±53	0.06
Amount of fluid used during operation (ml)	478±41	635±60	**0.001**

Values are expressed as mean ± SD. Data was analysed using unpaired student's t test. Values are expressed as significant if p< 0.05 (CL-95%).

The fluid used during operation are shown in Table-II. There were no difference of fluid requirement during preloading but it was significantly higher during operation in Gr-B (478±41 vs 635±60; p =0.001).

Table-III

Number of parturient required Ephedrine to treat intra-operative hypotension.

Groups / amounts	5 mg IV as single attempt	10 mg IV in two attempt	More than 10 mg in multiple attempt
Group-A	3 (10%)	2 (6.66%)	-
Group-B	5 (16.66%)	1 (3.33%)	1 (3.33%)

Values are expressed as frequency; within parenthesis are percentages over column total. Data was analysed using chi-square test. Values are expressed as significant if p< 0.05 (CL-95%).

Amount of Ephedrine used to manage hypotensive episode was different between two groups. In Group-A, Ephedrine 5mg was needed in 3 patient (10%), 10mg in 2 cases (6.66%). But in Group-B, Ephedrine 5mg was needed in 5 cases (16.66%), 10mg needed in 1 case (3.33%) and more than 10mg in 1 patient (3.33%) Table-III.

Table-IV

Neonatal data

Parameters	Group-A	Group-B	P value
Body weight (kg)	2.9±0.47	2.65±0.15	**0.01**
APGAR at 1 min			
< 7	20 (66.66%)	17 (56.66%)	
>7	10 (33.33%)	13 (43.33%)	0.6
APGAR at 5 min			
<7	28 (93.33%)	23 (76.66%)	
>7	2 (6.66%)	7 (23.33%)	0.7

Values are expressed as mean±SD or frequency as applicable; within parenthesis are percentages over column total. Data was analysed using unpaired student's t test or chi-square test. Values are expressed as significant if p< 0.05 (CL-95%).

Neonatal condition at birth was measured by APGAR scores at 1 min and 5 min. In Gr-A, APGAR score 7 or more than 7 were found at 1 min. in 20 cases (66.66%), less than 7 in 10 cases (33.33%) but at 5 minute score were found in 28 (93.33%) cases and in 2 cases (6.66%) respectively. In Gr-B, APGAR score 7 or more than 7 were seen in 17 cases (56.66%), less than 7 in 13 cases (43.33%) but at 5 minute score were seen in 23 (76.66%) cases and in 7 cases (23.33%) respectively.

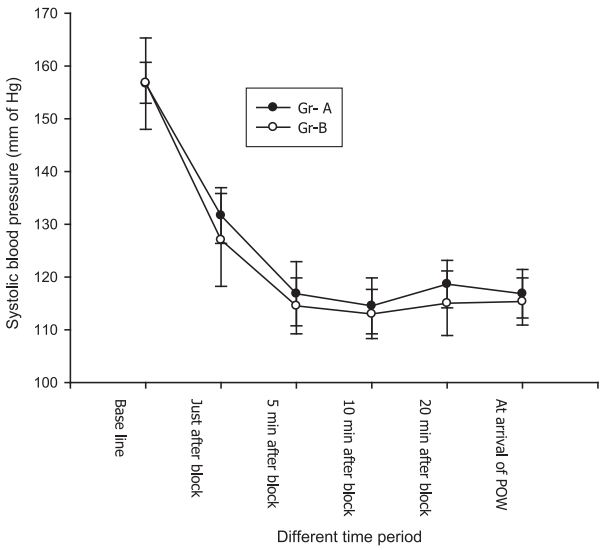

Fig-1: *Changes of systolic blood pressure in two studied groups*

There was a fall in systolic blood pressure in two groups. But there is no significant difference between the groups.

DISCUSSION

Spinal anaesthesia is cost effective technique for routine caesarean delivery than epidural block. Hood and Curry present a retrospective study, comparing effects of spinal and epidural block for caesarean delivery in severely pre-eclamptic

mother. They showed that the lowest recorded systolic arterial blood pressure in epidural group was 55mmHg and 58mmHg in spinal group. In the present study, spinal anaesthesia was performed in both the groups and only difference was control of blood pressure preoperatively in the operating room in one group. There was no significant changes of systolic blood pressure between the groups.

In the pre-eclamptic mother, the blood volume is decreased by upto 30%. Pre loading with crystalloid is a prophylactic measure of choice in the prevention of hypotension. In the present study, preloading of crystalloid fluid in two groups was almost equal (945ml vs 965ml, p= 0.06). But there were significant changes of intra-operative fluid infusion in two groups (478ml vs. 635ml; p= 0.0001). To treat hypotension, requirement of Inj. Ephidrine were almost similar in two groups. The results were consistent with the results of retrospective study done by Hood and Curry.

The neonatal outcomes were measured by Apgar score in one and five minutes. There were no significant changes of APGAR scores in one and five minutes in two groups.

CONCLUSION:

Under the condition of the present study it can be concluded that preoperative control of blood pressure of mildly pre-eclamptic parturient is not mandatory for caesarean section under spinal anaesthesia.

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Review Article

PRE-ANAESTHETIC ASSESSMENT: IT'S ROLE IN PREVENTING MORTALITY

Brig. General Razia Khanam (Rtd.)

INTRODUCTION:

Pre-operative evaluation is initial and one of the essential part of peri-operative care. Several large scale epidemiological confidential study into peri-operative death (CEPOD) showed that inadequate preparations of the patient were the major contributory factors for peri-operative mortality[1,2]. These include recognition of existing problems of the patient at the earliest opportunity. For these reasons the process must be designed to allow the patients with coexisting disease to be seen by an anaesthesiologist well in advance of proposed surgery[3]. This can be achieved if proper anaesthetic check up is done earlier as soon as the patient is scheduled for operative procedure. It is therefore essential that anaesthesiologists visit every patient in the ward before surgery to assess "fitness for anaesthesia".

Procedure of pre anaesthetic assessment

The preoperative visit enables the patient to meet the doctor and discuss possible causes of anxiety. The anaesthetist should explain how the patient would be cared for during operation and in the post operative ward and what measure would be taken for past-operative pain relief. Then the anaesthesiologist will proceed to obtain history, perform physical examination and order special investigations as dictated by the findings.

History :

The preoperative history should clearly established the patients' present problem which will help to plan the peri-operative anaesthetic management.

Presention of condition and concurrent medical history - The indication for surgery may influence anesthetic management quite dramatically. The systemic effects disease process must be quantified. There are many diseases which may have a significant impact on anesthetic management and its outcome, particularly disease of the cardiovascular or respiratory systems. Their presence or absence are usually ascertained by direct questioning and should be recorded carefully.

Family history- There are number of inherited conditions that have a significant influence on different aspects of planned anesthetic management, such as malignant hyperthermia, cholinesterase abnormalities, porphyria, certain heamoglobinopathies and dystrophia myotonica. If such a condition is suspected, a full investigation of relevant family member is beneficial.

Drug history- Many patients requiring surgical procedure might suffer from unrelated disease and about 42% of them receive regular drug therapy[4,5]. These drugs may have interaction with anesthetic agents or may cause problems related to their sudden withdrawal during preoperative period. There are other substances taken habitually by some patients that can also have a significant influence on the process of anesthesia. These include alcohol, tobacco. opioids and cocaine.

Anaesthetic history - Obtaining record of previous admission and anesthesia is very important. This will help to avoid repeatation of complications and planining of anesthesia. So, details of administration and outcome of any previous anesthetic exposure are important and mandatory. History of any pre-operative fear, fight, nausea, sore throat or headache should be taken into account and the anesthetist must attempt to clarify their clinical significance. History of any difficult intubation should be evaluated by physical examination.

History of allergy / hypersensitivity - Although severe anaphylactic reactions to anesthetic drugs are rare but they do represent an important cause of serious morbidity or mortality. Ratio of anaphylactic reaction to population was 1:25000[6]. Common drugs causing anaphylactic reactions are - antibiotics especially co-trimoxazole, penicillin and aspirin. Non-steroidal ani-inflammatory drugs (NSAIDS) are used commonly in the preoperative period may have a risk of cross-sensitivity to the patient. Patients having history of atopy may demonstrate greater sensitivity to release histamine or other vasoactive chemicals with increased reactivity of the

Former Advisor Specialist in Anaesthesiology, Bangladesh Armed Forces

cardiovascular or respiratory system on exposure to noxious stilmuli. A small proportion of patients may complain of an allergic reaction to previous anesthetic. The exact nature of symptoms and signs must be asked for, as the term allergy is not always understood properly by the patient.

Smoking- Cigarette smoking is one of the factors involve with adverse peri-operative outcome[5]. There are several potential mechanisms by which smoking is exerting these advance effects. It exerts short term effect as well as long term effects on various organs. Short term effects are due to inhalation of nicotine and carbon monoxide. Nicotine causes an increase in myocardial oxygen demand by its effect on heart rate, blood pressure and peripheral vascular resistance. Carbon monoxide get bind with haemoglobin to form carboxyhaemoblobin resulting in a significant decrease in oxygen delivery to the tissue. Short term effects are reversible if stopped for more than 12 hours. This is very important for the patient, suffering from ischaernic heart disease. Long term problems of smoking includes - depression of immune function, impaired clearance of secretion from the tracheobronchial tree and chronic airway diseases. These are less amenable to reversal. Stopping of smoking for 6-8 weeks are required to get any beneficial effect

Alcohol - Patient may be present with acute intoxication or sequence of chronic alcohol consumption. Once the diagnosis is established, it must be decided whether to continue alcohol consumption during admission or to run a course of withdrawal during pre-operative period - which has its own risk of morbidity and mortality.

Vomiting tendency- This may modify the choice of anesthetics which would reduce the likelihood of post operative nausea and vomiting.

Menstrual history- Elective surgery should be postponed in early pregnancy.

Pre-operative patient questionnaires

1. Do you suffer or have you suffered from any of the following: Yes No
   Heart disease
   Palpitations
   High blood pressure
   Chest pains
   Swelling of ankles
   Shortness of breath during walking up a single flight of stairs
   Asthma
   Bronchitis
   Diabetes
   Epilepsy
   Ulcer trouble or hiatus hernia ‘ Jaundice or other liver disease
   Kidney disease
   Anaemia
   Arthritis
   Stroke
2. Are you taking any tablets, pills, inhalers or medicines? lf yes, please list:
3. Have you any allergies? If yes, please list.
4. Do you smoke? If yes, what or how many a day? ..... /day
5. Do you drink more than a moderate amount of alcohol? (more than 8 pints beer/week or 10 glasses wine/week)
6. Do you bruise easily or bleed excessively?
7. Have you had any operations or general anesthesia before?
   If yes, please list, including approximate dates:
8. Were there any complications?
   If yes, please give details.
9 Have any members of your family had any problems with anesthesia?
10 Is there anything about yourself or your family’s medical history you think we should know?
   If yes, please details.

Physical examination

Physical examination is a simple, safe and cheap method of providing important pre-operative information. A full clinical examination should be performed on every patient and the findings must be documented. Beside history and routine clinical examination, there are areas where special preference are to be given during examination such as air way for difficulty intubation (Table-I).

Investigation

Laboratory tests are essential tools for appropriate diagnosis and to quantify a disease process. The relevance of investigation of anesthesia can be extended to provide a pre-operative baseline data with which peri-operative change can be compared. In general, results of some investigations can be predicted if a detailed history or examinations is available. Before ordering extensive investigations, the anaesthesiologist should be confirmed that the investigations will alter the management of the patient. Instead of doing a series of investigations as a matter of routine procedure, a guideline can be followed which will give pertinent information (Table-II).

RISK ASSESSMENT

An attempt has been made to classified or score patients preoperatively in order to identify those at greater risk of adverse outcome:

1. ASA (American society of anesthesiologist) grading

In ASA grading, the patient are classified according to disability related to patients general health, which correlates to some extend with risks of perioperative conlplications[7]. It predicts poorly when used alone as it does not embrace all aspects of anesthetic risk such as age, severity of the presenting disease or the proposed surgery and it does not identify factors which can be altered pre-operatively to improve outcome. Nevertheless it is useful in average prediction of the risk. (Table –III, IV).

Table - I

Clinical examination before anaesthesia

Systems	Points to examine
General	General well-being, nutritional state, build, colour of skin. hydration state, temperature.
Cardiovascular	Pulse-rate, rythm, volume; Jugular venous pressure and pulsations. Blood pressure, cardiac impulse. Auscultatory heart sound, Carotid pulsations, sacral or ankle oedema.
Respiratory	Observation of dyspnoa Auscultation of lung fields.
Central Nervous System	Function of special senses and other cranial nerves. Peripheral motor and sensory function.
Airway	Mouth opening, neck movements, Dental records.

Table-II

Guideline for pre-operative investigation

Investigations	Indication
Urine analysis	This should be performed on every patient. There might have occasional undiagnosed diabetic or urinary tract infection. Beware or false positive: if it is not confirmed by other evidence of pathology.
Urea, creatinine	All patients over 65 years of age or with a positive result from electrolytes and urinalysis. All patients with cardiopulmonary disease or taking cardiovascular active drugs, diuretics or steroids. All patient with a history of renal or liver disease, diabetes or an abnormal nutritional state. Any patient with a history of diarrhoea, vomiting or metabolic illness. Patients who have been on intravenous fluid therapy for more than 24 hours.
Blood glucose	All patient with history of DM, vascular disease and the patient receiving cortico-steroid.
Liver function tests	Any history of liver disease, alcoholism, previous hepatitis or unexplained fever following a recent general anesthetic. Any patient with an abnormal nutritional state.
Full blood count	All female adults, regardless of general health or reason for admission. All male patients over 50 years of age, and all other with history of blood loss, previous anaemia or haematopoitietic disease, cardio-respiratory disease or significant blood loss during surgery.
Coagulation screen	Any patient with a history of coagulation disorder, significant chronic alcohol consumption, drug abuse or taking anticoagulant medication. All patients belonging to an ethnic group at risk of cariying the sickle gene with previous unrecorded status (predominantly Afro-Caribbeans, but also includes Indians, those of mixed race and some southern Mediterranean countries).
Electrocardiogram	Male smoker>45 years old; all others>50 years old Any patient with a diastolic blood pressure greater than 95 mmHg during admission All patients with a history of heart disease (proven or suspected) or hypertension All patients on diuretics or cardiovascular active drugs Patients with symptomatic chronic or acute-on-chronic pulmonary disease.
Chest X-ray	History suggestive of possible abnormality, e.g. trauma, cardiovascular disease, pulmonary disease with localizing chest signs, A previously abnormal chest film. Any patients with thyroid enlargement (along with a thoracic inlet view) This investigation will not be necessary if a chest X-ray from the previous 6 months is available, and the patient's medical condition is unaltered.
Pulmonary Function Tests -	Patient with severe dyspnoea on mild to moderate exertion should ordered for – peak expiratory flow rate, forced vital capacity (FVC) and FEV_1.
Arterial blood gas analysis-	- All patients with dyspnoea, patients scheduled for elective thoracotomy.

Table-III

The ASA Physical Status Scale

Class I	A normal healthy individual
Class II	A patient with mild systemic disease
Class III	A patient with severe systemic disease that is not incapacitating
Class IV	A Patient with incapacitating systemic disease that is a constant threat to life.
Class V	A moribund patient who is not expected to survive 24 h with or without operation.
Class E	Added as a suffix for emergency operation.

Table-IV

Mortality rate after anaesthesia and surgery for each ASA physical status

ASA rating	Mortality rate %
I	0.1
II	0.2
III	1.8
IV	7.8
V	9.4

2. PAFS (Pre-operative assessment of fitness score)

This classification is based on physiological information, demographic feature and basic laboratory test for the assessment of peri-operative survival[9]. The specificity is 80%. It includes various scoring (Table-V) for the assessment of post-operative complication such as pneumonia, sepsis, non-infective organ failure within 30 days of surgery. Prospective identification of independent predictors of severe peri-operative adverse outcome is of utmost importance. Forrest and co-workers have undertaken a large-scale study, analyzing independent predictors of severe peri-operative adverse outcome over 17,000 patients[8]. A history of some cardiovascular disease, the needing abdominal or cardio thoracic surgery, specific demographic factors were found to be the most important predictors of severe cardiovascular or respiratory events.

Table-V

Pre-operative assessment of fitness score (PAFS)

	Preoperative factor
Score I for each	Cardiac symptoms controlled by treatment
	Dyspnoea on climbing stairs, Morning cough
	Stroke or myocardial infarction > 6 month age
	Hemoglobin <10 $g.dl^{-1}$
	Serum albumin 30-35 $g.litre^{-1}$
	Plasma urea 10-19$mmol.litre^{-1}$
	Steroid treatment
	Controlled diabetes
Score 2 for each	Age 70-79 years
	Cardiac symptoms poorly controlled by treatment,
	Dyspnoea on walking and Persistent cough with sputum
Score 3 for each	Clinical Jaundice
	Serum albumin <9$g.litre^{-1}$
	Loss of 10% body weight in 01 month
	Plasma urea>20$mmol^{1}$, Dyspnoea at rest
	Myocardial infarction <6 month ago, Confusion
	Cytotoxic treatment
Score 4 each	Age>80 years
	Palliative operation for surgery
	Intestinal obstruction
	Perforation, pancreatitis and intraperitoneal abscess.
	Hemorrhage or anaemia.

Evaluation of the score according to phyforth, et al[10]

- A total score of less than 6: indicates low risk (10%)
- A score of 6-10: high risk (84.4%) of postoperative death or major complication within 30 days of surgery

  The major complications are defined as pneumonitis, sepsis or non infective organ failure

PREDICTION OF SPECIFIC ADVERSE EVENTS

These are-

A. The difficult airway
B. Adverse cardiac events
C. Respiratory complications

A. Prediction of difficult airway:

Physical features related with difficult intubation includes

1. General appearance of the neck, face, maxilla and mandible
2. Jaw movement, mouth opening
3. Head extension and neck movement
4. The teeth and oropharynx
5. The Soft tissues of neck
6. Recent chest and cervical spine X-ray
7. Previous anesthetic records,

Unfortunately, difficult intubations still unexpectedly occur, causing more anaesthetic morbidity and mortality[1,10]. Mallampati and colleagues devised a classification based on visible pharyngeal structures when the patient opens the mouth maximally and protrudes the tongue[11]. This was subsequently modified by Samson & Young (Table-VI)[12]. This is a simple bedside test but sometimes related with a high incidence of false positive. To improve upon the observers variability, Wilson and colleagues described a five point features which includes weight; movement of head, neck and jaw; presence of mandibular recession or absence of buckteeth. These also produce a significant number of false positive[13,14]. When Mallapati test is combine with Thyromental Distance (TD) the false positivity is reduced. Now it is suggested that any patient with thyromental distance of less than 7 cm and Mallampati grade III or IV; patient may present with intubation problem[15]. Cormack and Lehane described a standard method of grading depending on laryngoscopic view (Table-VII)[16].

Table- VI

Mallampati's modified classification

Grade	Description
I	Pharyngeal pillars, soft palate and uvula visible
II	Only soft palate and uvula visible
Ill	Only the soft palate visible
IV	Soft palate not visible

Table-VII

Cormack & Lehane's grading depending on laryngoscopic view

Grade	Structures visible at laryngoscopy
I	Vocal cord visible
lI	Arytenoid cartilages and posterior part of the vocal cords visible
III	Epiglottis visible
IV	No exposure of the glottis, or of the corniculate cartilages
Evaluation of Cornack & Lahane grading	
I	No difficulty
II	Slight difficulty
III	Severe difficulty
IV	Intubation impossible without special method.

B. Adverse cardiac events

Opinions are conflicting regarding prediction of serious perioperative cardiac events. Goldman and colleagues are renowned for their retrospective study on cardiac event in patient undergoing non cardiac surgery[17,18]. Their risk indices (Table-VIII & IX) gives a guide to major cardiac complications.

Similar risk indices have described more recently (Table-X), although controversy persists about the most accurate predictors of serious pre operative cardiac events[12]. One of the most sensitive factor is the presence of pre-operative hypertension. Gross hypertensive responses, with ECG evidence of ischaemia on some occasions are likely to occur due to noxious stimuli during anesthesia in hypertensive patients. Whether treated or not, if the pre-operative diastolic pressure exceeds 110 mm Hg, there is a chance of ST changes with an

increased incidence of postoperative myocardial infarction. So the patients should be prepared for surgery in such a way that these changes are less likely to occur. Thus patients, who are presented with a diastolic arterial pressure more than 110 mmHg, should receive antihypertensive treatment. Several days or weeks may be required to stabilize the cardiovascular system. Controlled or uncontrolled hypertension is usually associated with increased cardiac peri-operative morbidity[19,20]. On the other hand over aggressive treatment of hypertension, that is diastolic pressure less than 85 mmHg may itself increase morbidity or mortality in those with ischaemic heart disease, perhaps due to inadequate coronary artery perfusion pressure[21]. Hypertensive patients with left ventricular hypertrophy is associated with an increased risk of peri-operative myocardial ischaemia due to imbalance of myocardial oxygen supply and demand, even in the absence of coronary artery disease[22].

Table-VIII

Goldman's multifactorial Cardiac Risk Index (CRI)

Risk factor	Points
Heart failure	11
Myocardial infarction<6 month	10
Cardiac rhythm other than sinus	7
Ventricular ectopics>5 Min	7
Age>70	5
Aortic stenosis	3
Thoracic or abdominal surgery	3
Poor general medical condition	3
Emergency operation	4

Table-IX

Evaluation of Goldman's Cardiac Risk Index (CRI)

Points	Major cardiac complications
0-5	0.3 -3%
6-12	1-10%
13-26	3-30%
26-53	19-75%

The total score relates to cardiac mortality or morbidity. With patients scoring -25, found to be significantly related with higher risk of life threatening peri-operative cardiac event (myocardial infarction, cardiac failure or ventricular tachycardia).

Table-X

Incidence of perioperative re-infarction in relation to interval between first MI and Surgery

Interval since MI	Re infarction risk
Under 3 months	up to 30%
3-6 months	up to 15%
Over 6 months	up to 6%

Table-XI

Incidence of perioperative MI : Retrospective studies

- 0.1 - 0.4 % MI, in previous healthy patient
- 3.2 - 7.7 % MI, in patient with previous MI
- 50% are Silent
- Occurrence - majority after 3rd day of surgery
- Mortality - 40% - 60% in preoperative MI

C. Respiratory complication

Although the post-operative pulmonary complications are very frequent, pre-operative respiratory functional tests are not necessarily helpful in their prediction. One retrospective study by Nunn and colleagues examined patients undergoing elective surgery who had a severely limited forced expiatory volume (FFV_1< 1) on pre-operative assessment[23]. They found the only useful predictors of the need for postoperative ventilation to be the combination of a pre-operative arterial oxygen tension of less than 9kpa and the presence of dyspnoea at rest.

Guideline for preoperative therapy

Disease	Therapy
Respiratory disease	* Chest physiotherapy
	* Sputum for bacterioloical test and culture
	* Appropriate antibiotic therapy
	* Bronchodilators - Where applicable
	* Avoidance of drug associated with the release of histamine & SRS substances.
Cardiovascular disease	
Hypertension	* Antihypersive drugs (Diastolic blood pressure should be <110 mm Hg).
Myocardial Ischaemia	* Interval between fist MI and surgery >6 months.
Valvular heart disease	* Antibiotic prophylaxis against infective endocarditic.
Arrhythmia's	* Drug therapy
Conduction defect	* Insertion of pacemaker pre-operatively it necessary
Renal Disease	* Up to date blood urea, serum electrolytes and creatinine estimation.
	* Correction of uremia and potassium imbalance. Hepatic diseases
Obstructive jaundice	* Mannitol at or just before induction
Hepatorenal syndrome	* IV fluid should be started night before Surgery
Bleeding problems	* Inj vit K 10mg-3 days before surgery
Smoking habit	* Stop smoking 12 hours for reversal of short-term effects 6-8 weeks for reversal of longer-term effects.
Alcohol consumption	* Better allow to continue than to have withdrawal syndromes.
Endocrine disease:	* Control by direct suppression of endocrine over activity or its effect on target organ.
Diabetes Mellitus	* Close control of blood glucose concentration
Steroid	* Additional steroid cover is required during preoperative period.
Contraceptive pill	
Progesterone containing pill	* Medication need not be stopped
Oesrtrogen containing pill	* Stop 4 weeks pre-operatively and recommence at the first menstrual cycle post-operatively.
	If early post-operative o Heparin prophylaxis is not indicated. mobilization
If pill is not stopped and /or early post-operative mobilization is not possible	* Prophylactic subcutaneous low dose heparin is indicated.
Hormone replacement therapy (HRT)	* No special precaution is required
Dental condition	* May be removed before anesthesia to prevent
Loose teeth	chance of dislodgement and aspiration .
Poor oral hygiene	* Referral to an oral surgeon.

CONCLUSION

Discussion between surgeon and anesthetist is essential for optimum prediction of risk. The responsibility of anasthesiologists is to recognize the risk factors and to ensure that those should be corrected before surgery. It is therefore essential to visits the concerned patient before surgery to assess the fitness for anesthesia. This can be done in the anesthetic outpatient clinic, to which a patient is referred before admission. Thus the anesthetist can make a rapport with the patient, explain the procedure regarding anesthetic and surgical management and an informed consent for the proposed procedure can be taken from the patient or patient's guardian.

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Original Article

RADIO-FREQUENCY THERMAL ABLATION OF LUNG CANCER UNDER EPIDURAL ANAESTHESIA: COMPARISON OF THE EFFECTIVENESS OF BLOCKS BETWEEN HIGHER AND MID-THORACIC LEVEL

MR Khandoker[1], H Razwanul[2], H Rashadul[3], AM Sarwar[4], UH Shahera Khatun[5]

ABSTRACT:

Purpose of the investigation is to evaluate the effectiveness of high thoracic epidural block in comparison to mid-thoracic epidural during Radio-frequency ablation for lung cancer. 60 patients (38 male) were selected for epidural segmental block who were proposed for radiofrequency thermal ablation for lung cancer. Patients were randomly divided in 2 groups: Group-A, higher thoracic epidural group & Group-B, mid-thoracic epidural group. Under all aseptic preparation 18 G Epidural catheter was inserted through 18 G epidural needle and 4-6 ml of 0.5% bupivacaine was used during anaesthesia. Extend of block was demarcated by pain prick. RFT probe was allowed to insert 30 minutes after anaesthesia. The heat rate, blood pressure, respiration, $Sp0_2$ and temperature were monitored continuously during the procedure. Excellent block was found in 21 cases of Group-A and 15 cases of Group-B. Anaesthesia was inadequate in two cases of Group-A, and in 5 cases of Group-B, So, Higher thoracic epidural technique is better than mid thoracic epidural.

INTRODUCTION:

Radio-frequency Thermal (RFT) ablation of the lung cancer can be performed by percutaneous insertion of electrode into the tumor mass under ultrasonic or C.T. guidance. This is a surgical technique in which a wide diameter probe termed as Le-veen multiple array needle electrode is inserted into the tumor mass through an incision in the chest wall[1,2]. Severe pain is experienced due to needle insertion and burning during RFT ablation[4]. General anaesthesia in not suitable as communication is not always possible with patient, which may be required during the procedure.

The procedure can be done under regional anaesthesia. Any surgical manipulation in the chest wall even radical mystectomy or Thoracotomy is very well tolerated under epidural block[4]. So, presence study was done to compare high thoracic epidural block with mid-thoracic epidural to find out the best anaesthetic technique for RFT of lung.

METHODS AND MATERIALS:

60 patients (38 male), aged between 45-75 years were selected for thoracic epidural block who were proposed for Radio-frequency thermal ablation of lung cancer. The patients gave written informed consent for the study, which was approved by the research ethics committee, DMCH, Dhaka. Patients with severe cardio-respiratory impairment, hemorrhagic diathesis and known allergic to drugs were excluded from the study. These patients were randomly divided into two groups. In Group-A, 30 patients were selected for higher thoracic epidural (between T_1-T_4) and in group-B, another 30 patients were selected for mid-thoracic epidural (T_5-T_8. In each patient, an intravenous access was established and preloaded with 500 ml of Ringer's solution. Epidural block was performed with 18G epidural needle and 18G epidural catheter (B. Brown) was inserted through epidural needle. In group-A, catheter was placed between T_1-T_4 space and in group-B, catheter was placed between T_5 -T_8 space. 0.5% Bupivacain of

1. Junior Consultant Dept. of Anesthesiology, DMCH
2. Associate Professor Dept. of Cardiac Surgery, BSMMU
3. Professor of Pulmonology, NICVD, Dhaka
4. Interventional Oncologist, American Super Specialized Hospital Limited, Bangladesh
6. Professor Dept. of Anesthesiology, DMCH

4-6 ml was used for anaestheia. Extend of block was identified by pin prick. 30 minutes later, after proper positioning of the patients, RFT probe was allowed to insert percutaneously into the tumor mass of the lung. The patients were monitored for heart rate, blood pressure, $Sp0_2$, and body temperature. Oxygen was supplied by nasal cannula. The probe is connected to Radio-frequency machine and heat was produced between 80-100° C which coagulate the tumor tissue.

RESULT:

Patient characteristics are presented in Table-I. The patients of each group were further divided depending on the patient's response to pin pick into excellent, moderate & inadequate (Table-II).

Excellent block was found in 21 cases of group-A and 15 cases of group-B, where no supplementary drugs were required. Moderate block occurred in 7 cases of group-A and 9 cases of group-B, where local infiltration of anaesthetics was required to perform the RFT ablation.

Regional anaesthesia was inadequate in 2 cases of group-A and 5 cases of group-B, where both local infiltration and additional intravenous narcotic drugs were required (Table-II).

Table-I

Patient characteristics

	Group – A (High thoracic epidural)	Group – B (Low thoracic epidural)
Sex (M : F)	20:10	18:12
Age (Year)	62.8±7.4 (45-76)	63.8±10.8 (48.75)
Weight (Kg)	55.2±6.8	57.7±9.2 (42.65)

Table-II

Quality of block

Quality of block	Group A	Group B
Excellent block	21 cases	15 cases
Moderate type block	7 cases	9 cases
Inadequate block	2 cases	5 cases

Haemodynamic stability were similar in both groups. Mean arterial pressure (MAP) varies <20% in both groups. In 46 patients heart rate were within normal rate. But bradycardia developed in 14 cases of both groups where patients were treated with Inj. Atropine. The cooperation of the patients are shown in the Table-III.

Table-III

Patients Co-operation during procedures

Patients co-operation	Group-A	Group-B
Fully co-operative	21 cases	17 cases
Restless after one hour	7 cases	9 cases
Restless & un co-operative	2 cases	3 cases

DISCUSSION

Radio-frequency ablation (RFT) is a new technique where high energy radio-frequency wave is employed to destroy non-small cell lung cancer[1]. The procedure is painful due to heat production and needle insertion in the chest wall[5]. General anaesthesia can be used for this purpose but post-operative respiratory support may be required in some patients due to compromised lungs. Beside these, communication with patients may be required during RFT ablation. So, general anaesthesia is not absolutely suitable. Surgical intervention in the chest wall can be done by lumber epidural anaesthesia. But large quantities of local analgesic drugs are necessary to produce anaesthesia in the thoracic region[5]. The thoracic epidural block may be suitable alternative for this type of surgical intervention. One of the advantages of thoracic epidural block is that the area of analgesia is confined to the area of operation due to segmental block, thus minimizing the vaso-motor paralysis and subsequent fall of blood pressure. Higher epidural block may sometimes interfere sympathetic activity to the heart which may cause hypotension and bradycardia but effect is less with smaller dose of 0.5% Bupivacine. Dose of the Bupivacane 1.5 ml / segment between the age of 50 to 65 years and 0.6-1ml/segment between 65 to 80 years of age may be used. A complete relief of pain improves diaphragmatic function, ventilation and prevents hypoxia even in abnormal position. The thoracic epidural block produces small reduction of cardiac output, heart rate, blood pressure and decreased myocardial oxygen demand and maintain the cardiovascular status in a relatively normotensive

range[6]. When thoracic or abdominal pain limits the capacity to breathe, epidural anaesthesia clearly improves the vital capacity, functional residual capacity and the PaO_2. Block of autonomic nerves does not cause bronchospasm as might be expected[7]. The thoracic epidural block is definitely cost effective for such procedure than that of general anaesthesia[7].

CONCLUSION:

Radio-frequency thermal ablation of lung cancer under thoracic epidural block is new in Bangladesh. It is cost effective and safe technique. So, higher epidural segmental block is a suitable anaesthetic technique for this procedure where patient remain alert with adequate ventilatory function[3].

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Original Article

TRACHEAL INTUBATION WITHOUT MUSCLE RELAXANT COMPARISON BETWEEN THREE TECHNIQUES

M. Ali, KM Iqbal, AYF Elahi Chowdhury

ABSTRACT:

The standard techniques of tracheal intubation are usually done after induction of anaesthesia followed by skeletal muscle relaxation. The muscle relaxants are associated with many side effects. These side effects have spurred research into development of alternative methods for providing good intubation condition.

Forty-five patients with ASA grade I or II, having Mallampati class-I or II airways were divided in three groups depending on administration of drugs in a double blind randomized study. Group-A, thiopental sodium (5mg/kg) + fentanyl (10mcg/kg) + lignocaine(1mg/kg), Group-B, thiopental sodium (5mg/kg) + fentanyl (10mcg/kg) and Group-C, thiopental sodium (5mg/kg) + suxamethonium(1mg/kg) Group-C acted as control. The blood pressure and heart rate were measured before induction,after induction and after intubation. Ease of intubation was judged by Scheller intubation criteria. The intubation was possible in all patients of the three groups and there were no significant differences between them in respect to total score.

INTRODUCTION:

The tracheal intubation is usually performed after induction of anaesthesia followed by relaxation of skeletal muscles with depolarising or nondepolarising muscle relaxant. But this conventional process of intuabtion is sometimes associated with side effects. Many of these effects are trivial but some are of grave consequences and the avoidance of them becomes a priorty for aneasthetist for the ultimate welfare of the patient[1]. Prolonged paralysis, malignant hyperthermia, anaphylactic reactions, myalgia, muscle damage, increased intracranial or intraocular pressure, hyperkalemia, masseter rigidity and increased intragastric pressure are among the many of the side effects of depolarising muscle relaxants. The use of nondepolarising agents may cause anaphylactic reactions, delayed onset, aspiration of gastric contents and inability to reverse the paralysis quickly etc.

The above side effects have spurred research into the development of alternative methods for providing good intubation conditions. Several combination of drugs like thiopentone, fentanyl, propofol, alfentanyl, lignocaine etc have been tried with satisfactory results[2,3,4,5,6]. As The availability of drugs is limited in Bangladesh; we have designed this study with three locally available drugs-thiopentone, fentanyl and lignocaine.

MATERIALS AND METHODS

Forty-five patients of both sexes and aged between 30 – 50 years of ASA physical status - I & II with Mallampati class-I & II were included in a double blind, randomized study. The local ethics committee approved the protocol. Written informed consent was taken from each patient. The patients having full stomach, reactive airways disease and history of addiction with drugs or alcohol were excluded from the study. Patients scheduled for routine surgical procedures were allocated randomly into three groups. The randomization was done by selecting cards named as 'A' 'B' & 'C'.

Department of Anaesthesiology, BSMMU, Dhaka

Group A : TPS + Fentanyl + Lignocaine.

Group B : TPS + Fentanyl

Group C : TPS + Suxamethonium

The venous access was secured in all patients followed by premedication with intravenous midazolam. All patients were preoxygenated for three minutes. In Group-A, at first fentanyl at the dose of $10\mu kg^{-1}$ was given intravenously and one minute later, lignocaine $1mgkg^{-1}$ was also given intravenously. Then the patients were induced with TPS, $5mgkg^{-1}$. In Group-B, lignocane administration was avoided but other process of induction of anaesthesia was almost like Group-A. In Group-C, TPS was followed by suxamethonium. During this period, patients were ventilated with 100% oxygen. Thirty seconds after induction of anaesthesia, the patients were evaluated for ease of ventilation and ten seconds later, evaluation of ease of jaw opening was noted. Then laryngoscopy was attempted and parameter of the exposure of the vocal cords was recorded. If intubation would fail in any patient, it was planed to follow the failed intubation drill.

The arterial blood pressure both systolic and diastolic and heart rate were monitored before induction, after induction and after intubation. The study was terminated within two minutes of intubation. Data was compiled and was analyzed by using the student "t" test for comparison among the groups. Significant level was taken with 95% confidence limit.

Appendix-I

Scoring criteria for various airway conditions and responses

Criteria	Score allotted	score received
Mask ventilation		
Mask ventilation easy	3	
Mask ventilation difficult	2	
Mask ventilation impossible	1	
Jaw mobility		
Jaw mobile	3	
Jaw partly mobile	2	
Jaw immobile	1	
Exposure		
Vocal cord, arytenoids visible	3	
Vocal cords, arytenoids partly visible	2	
Vocal cords, arytenoids not seen	1	
Cord position		
Vocal cords open	3	
Vocal cords midposition	2	
Vocal cords closed	1	
Movement & cough		
No movement	4	
One or two coughs	3	
Persisting coughing	2	
Movement	1	

RESULTS

There was no significant ($p<0.05$) difference between groups in terms of gender distribution, mean patient age and weight (Table-I). There were no significant ($p<0.05$) preinduction differences between groups in heart rate or blood pressure (Table –II).

Table –I

Patient characteristics of three groups

Characteristics		Group A (n=15	Group B (n= 15	Group C (n=15)
Age (yrs)		38.13 (10.2	39.8 (12.53)	39.13 (11.66)
Sex	Male	3	5	5
	Female	12	10	10
Body Weight		55.93 (6.36)	54.4 (6.95)	56.33(6.78)

Mean + SD

* $P<0.05$

Table-II

Haemodynamic values in 3 groups

Parameters	Before induction			After induction			After intubation		
	A	B	C	A	B	C	A	B	C
B.P									
(mm of Hg)	121	125.33	111.6	78.8	79.2	103.66	89.66	95.66	135.33
	(13.9)	(22.44)	(17.28)	(13.7)	(16.56)	(16.95)	(10.7)	(14.74)	(13.95)
Diastolic	77.66	79	71.6	61.3	62.3	68.66	61.3	67.66	88.33
	(9.79)	(11.37)	(8.38)	(8.3)	(12.08)	(11.09)	(8.3)	(11.47)	(7.94)
Heart Rate	98.26	92.06	90.04	78.26	79.2	88.4	81.6	79.86	102.4
(per min)	(12.66)	(14.63)	(9.65)	(6.79)	(3.47)	(10.3)	(7.49)	(12.03)	(8.25)

Values are expressed as mean ± SD; values are regarded as significant if P<0.05.

The heart rate and blood pressure both systolic and diastolic were decreased significantly after induction in groups A and B but after intubation it rose significantly in these groups. The decrease in blood pressure after induction and intubation in Group-A & B were significantly lower than that of Group C. In Group-C, post induction fall of blood pressure was not significant in comparison to preinduction levels but the heart rate and blood pressure both systolic and diastolic rose after intubation (Table-II).

Induction parameters like jaw mobility, ease of ventilation were also similar (Table-III). Exposure and visualization of vocal cords was satisfactory in all patients as judged by Cormack and Lehane[7] classification and was found to be in grade I or II. No patient required subsequent suxamethonium for intubation.

Table-III

Intubation score (Total) as the basis of scheller intubation score.

Parameters	A	B	C
Scheller Basis	14.73	14.6	15.8
Of intubation	(0.7)	(0.73)	(0.35)
Score (total)			

Mean±SD; P<0.05

The position of vocal cords was found to be significantly (p<0.05) wide in Group-C (Table –IV). But no patient had closed vocal cords or incidence of laryngospasm during intubation.

Table-IV

Breakdown score from scheller intubation parameters

	A	B	C
Score for	2.2	2.31	3
Cords position	(0.41)	(0.51)	(0)
Score for cough	3.6	3.4	3.43
And movement	(0.63)	(0.63)	(0.5)

Mean±SD; P<0.05

Tolerance to intubation as indicated by absence of coughing immediately after intubation was significantly (p<0.05) better in Group-C. Only two patients in this group had one or two coughs after intubation as compared to four in Group-A and nine in Group-B. Among these, one patient in each group A and B had persistent coughing.

DISCUSSION

Our study demonstrates that tracheal intubation is possible to perform reliably in premedicated patients with favorable airway anatomy after intravenous induction of anaesthesia without simultaneous administration of muscle relaxants.

Many authors have done near identical studies and have also found similar but not identical results. Scheller, et al[2] have used alfentanil instead of

fentanyl and have found ease of intubation which was similar to that of the control. However they have recorded more coughs after intubation. In there study, they did not used Lignocaine. Yukioka H, et al[3] have found that lignocaine suppressed cough significantly ($p<0.05$) when the patients were intubated without the use of skeletal muscle relaxant.

Hovorka J, et al[4] concluded that intubation condition were not readily acceptable without the use of muscle relaxant though they found difficulty during intubation in only one patient. They also did not compare there study with control group. They however concluded that tracheal intubation was more easily accomplished with thiopentone than propofol.

Results of Keller S[5] were much similar to our study, where the time taken for intubation from the start of inducion was four minutes. This may increase the susceptability of aspiration in high-risk patients. This can be avoided by using drugs with faster onset like alfentanil

The heart rate and blood pressure both systolic and diastolic were considerably reduced in Group-A and B as compared to preinduction values. In Group-C both systolic and diastolic blood pressure and heart rate rose significantly ($p<0.05$) after intubation. In this study we also found that attenuation of cardiovascular response to intubation can be achieved by this method.

Our study was terminated at two minutes of intubation and we also found that immediate administration of supplemental anaesthesia is required, otherwise the patient might move or cough within few minutes.

CONCLUSION

It can be concluded that in premedicated healthy patients with favorable airway anatomy, tracheal intubation may be accomplished by using a combination of fentanyl (10mcg/kg) and lignocaine (1mg/kg) with Thiopentone sodium (5mg/kg). Simultaneous administration of muscle relaxant may not require for tracheal intubation. This technique may be of value where muscle relaxants are contraindicated due to the undesirable side effects. But routine use of the technique is neither acceptable nor recommended.

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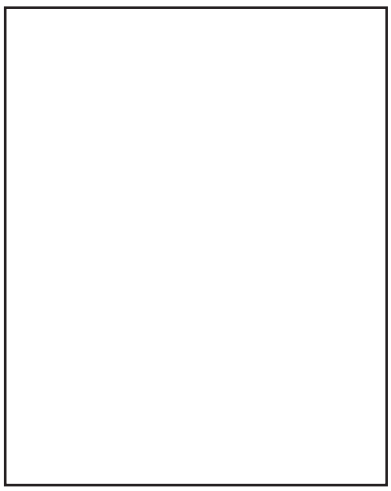
Obituary



Dr. Mohammad Abu Zafar, MBBS (DU), MCPS (BCPS) son of Late Alhaj. M Gauhar Ali, Associate Professor, Dhaka National College and Hospital, Dhaka passed away on January 12, 2004. He was born on December 25, 1938. He was graduated from Dhaka Medical College in 1964 and then completed post graduation in MCPS from BCPS in 1985. He was trained in anaesthesia from Newffield College, London (1969-70). He left behind his widow, Mrs. Nargis Zafar and two daughters. He was man with a amiable character. We express our deep feelings to the bereaved family members and pray to Allah for peace to his departed soul.