EDITORIAL

Should humans be used as a teaching tool? -Simulation in anaesthesia

On 13th of April 1970 the Apollo XIII astronauts notified their mission control that a devastating explosion in one of the oxygen tanks had taken place. At that time they were thousands of miles away from the earth moving very fast in an unknown direction. Lives of all three of them i.e. Fred Haise, John Swigret and James Lovell were in great danger. They never gave up but continued their voyage after giving up the command module and performed necessary repairs, completed the mission and landed safely on 17th April 1970 [1]. This is a story of shear commitment, great courage and application of knowledge and training at the time of absolute need and extreme danger. None of them had had any 'practical experience' of a similar situation before. Behind their success was years of exhausting training on ground of coping up with worst case scenarios on simulators. Simulators have been in use for years now; starting from their use in aviation and space exploration, military trainers have been quick to grasp their benefits. Advanced computer technology has firmly secured its place in the modern armament and present day guns, tanks, fighter-bombers and even missiles, bombs and alike, all are heavily dependant upon the chip. The increased complexities in the defense arsenal has led to development of training simulators, in which computers simulate real looking (virtual) scenes of different situations; normal as well as abnormal or usual and unusual. Trainees practice with these simulators and get prepared for the real life experience.

The purpose is not to downplay the importance of experience in the fields of aviation, astronomy or anesthesia, where there is no second chance to rectify the mistakes, but, is it necessary to learn or get trained only after passing through a devastating experience? The wisdom dictates us to learn from the mistakes of the others. Human life is too precious to be used for experimenting or imparting training, be it our own or anybody else's. After all patients are not the guinea pigs. With modern developments in bioengineering it has become possible to simulate almost all body actions, biochemical reactions included. Simulators are available in the market with huge number of worst case scenarios already fed in the software with multiple options to change and improve according to our need.

By convention, we all have been getting and imparting training on patients. In an emergency department, where the life of the patient is in grave danger, how ethical it will be to train e.g. endotracheal intubation. Anaesthesia is a specialty that requires quick reflexes with prompt application of knowledge and skills with zero chance of error. This all is only possible with continuous training on scenarios, which you might come across only once in your life. Medical literature is rich with case reports of such incidences. Theoretical knowledge is important but to be able to confront with the disasters quickly and efficiently will come only through simulators. The past two decades have seen rapidly growing interest in using simulation for purposes of improving patient safety and patient care through a variety of applications. The reason for this expanding interest is multifactorial. Many simulation professionals would cite the Institute of Medicine publications To Err Is Human[2] and Crossing the Quality Chasm[3] as the primary catalyst of this change. Others might say the power of experiential learning better fits the needs of a 21st century health care learner.[4] Regardless of what you believe, simulation training has arrived in health care education. The Society for Simulation in Healthcare <ssih.org> was formed in January 2004. The first issue of Simulation in Healthcare (a peer-reviewed, multidisciplinary journal) was published in January 2006 <www.simulationinhealthcare.com>.

Simulation is a technique, not a technology, to replace or amplify real experiences with guided experiences, often immersive in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion.[5]

Training on simulators offers the obvious advantage of repeated practice to acquire a skill while allowing the performers to err. In addition, it provides a chance to get training of uncommon and very rare scenarios with provision of repetition of training so that skills could be maintained. Possibility of stopping the scenario in the middle with a question answer session and restarting the same scenario is also a great help in training a skill[6]. Simulation also teaches leadership, ability to work in groups, task assignment and communication skills [7]. This all is done in presence of an experienced clinician trainer equipped with computer based assessment tools available inside the same room or sitting in other room not visible to the trainee. This gives a high authenticity to the whole process. The best example of the success of simulation training is perhaps the success of BLS and ACLS programs throughout the world in which training is imparted on mannequins with simulated

conditions.

Bigger medical institutions should have a simulation based training program. Ideally, a simulation center should be a complex of three or four rooms including a simulation room, a control room, a conference/debriefing room, a supply room, and a storage room[8]. The simulation room, main area where training occurs, should ideally be flexibly converted into a range of different rooms/areas where patient care takes place e.g. operating room, ICU, ER, ward, home care etc. A well equipped library and high speed internet connection should also be available in the vicinity. The whole complex should be well equipped for education, research and development. A high resolution video camera with DVD recording and replay facility is also necessary. The curricula, techniques, and assessment tools should be meticulously researched and developed after consultation with experts in the field.

Simulation could be full-scale (high fidelity) or individual skill based according to the requirements. Mannequins of three different companies namely METI®, Laerdal® and Ambu® are available in Pakistan. While Ambu® specializes in BLS and ACLS mannequins and airway and IV trainers, METI® and Laerdal® also provide full-scale (high fidelity) mannequins. All have their advantages and disadvantages and one should carefully select the mannequin according to the requirement. Computer based learning programs mimic many adverse scenarios and their management, e.g. cardiac arrhythmias, hemorrhage, injuries etc. Anesthesiology is the leading specialty that has adapted the idea of simulation and as part of her commitment to patient safety is pioneering different new ideas in this field. Other specialties have followed the suit. Rescue and trauma teams in advanced countries routinely utilize either mannequin based or computer based training programs. Its usefulness has been proved in undergraduate as well as postgraduate medical studies and assessment of competencies.[9-11]

A simulation trainer, however, must have certain limitations in mind while imparting the training. These include, lack of accuracy of a simulator in simulating the reality, difference in feel in handling rubber or plastic as compared to live human tissue, non serious attitude of certain trainees as they may take it as a game, and lack of application of skills learnt in a simulated scenario[12].

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Dr Shahab Naqvi

HOD, Department of Cardiac Anaesthesia

AFIC/NIHD, Rawalpindi (Pakistan)

ORIGINAL ARTICLE

Effect of two different doses of fentanyl on intubating conditions with sevoflurane inhalation without neuromuscular blocking agents in adults

Mansoor Aqil, Aziz-ul-Haq**, Amjad Rasheed***, Rana Altaf **.*

**Associate Professor of Anesthesiology, College of Medicine, King Saud University, Consultant anesthetist, King Khalid University Hospital and King Abdul Aziz University Hospital, Riyadh (Saudi Arabia).*
***Consultant anesthetist, *** Specialist anesthetist*
King Abdul Aziz University Hospital, Riyadh (Saudi Arabia).

Correspondence: *Dr. Mansoor Aqil, Associate Professor of Anesthesiology, College of Medicine, King Saud University, Consultant anesthetist, King Khalid University Hospital and King Abdul Aziz University Hospital, P.O. box 245, Riyadh 11411, (Saudi Arabia); Email: mansooraqil@yahoo.com; Phone:0096614775703 (office); 00966507221058 (mobile); Fax: 0096614786100 Ext. 7525*

ABSTRACT:

Purpose: To compare the effect of two different doses of fentanyl on intubating conditions, after inhalational induction with sevoflurane in adults, without using neuromuscular blocking agents.

Methods: In this prospective, randomized, double blind study, fifty six adult patients with ASA status I–II, without any airway problem and scheduled to undergo elective surgical procedures under general anesthesia requiring endotracheal intubation were selected. Patients with allergy to any of the drugs used, body mass index > 30 kg/m2 and anticipated difficult airway were excluded from the study. Patients were premedicated with midazolam 0.1mg/kg and ranitidine 150 mg PO two hours prior to surgery and received 0.2 mg of glycopyrrolate intravenously just before the start of inhalational induction. The patients were randomly divided into two groups. Group-I patients received fentanyl 2 μg/kg and those in Group-II received 3 μg/kg intravenously one minute after the start of inhalational induction with 8% sevoflurane in 50% nitrous oxide and oxygen. After 4 minutes of start of inhalational induction, conditions for tracheal intubation were assessed based upon a set of criteria.

Results: Tracheal intubation was successful in all patients. Mean time to loss of consciousness was 47 sec in Group-I and 46 sec in Group-II. Optimal intubating conditions were higher in the Group-II (89% vs. 54% P <0.01).The incidence of post-intubation coughing was lower in the Group-II as compared to Group-I (11% vs.39%) with P <0.02.

Conclusions: We conclude that both doses of fentanyl along with inhalational induction with sevoflurane nitrous oxide mixture provided adequate conditions for tracheal intubation without using neuromuscular blocking agents. However, increasing the dose to fentanyl to 3μg/kg further improved the intubating conditions. Tracheal intubation using sevoflurane and fentanyl may be an alternative to traditional tracheal intubation with neuromuscular blocking agents.

Keywords: Intubating conditions, Inhalational induction, Endotracheal intubation, Sevoflurane, Fentanyl

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INTRODUCTION

Inhalational induction has been a classical technique. It used to be slow and stormy with ether and hence was replaced by IV induction. During the recent past, the introduction of sevoflurane has offered an attractive alternative to IV induction and promised a resurgence of the forgotten technique (1). It has a pleasant smell with minimum irritation to the airways and the induction with it is rapid due to its low blood: gas solubility coefficient of 0.69. These qualities make it close to an ideal anesthetic agent (2-5). Advantages of inhalational induction are lack of pain with drug injection, confirmation that the patient can be ventilated at the time of induction of anesthesia, the use of

a single agent for both induction and maintenance and avoidance of neuromuscular blocking agents for tracheal intubation. However, induction time for adequate depth of anesthesia for tracheal intubation with sevoflurane is long when compared to traditional IV induction with muscle relaxants (6–7). Addition of nitrous oxide (N2O) reduces the MAC of sevoflurane and also shortens the time of induction (8,9). Opioids reduce the MAC of sevoflurane (10). Fentanyl is an opioid with quick onset and has a short half-life. We assumed that addition of fentanyl would speed up inhalational induction with sevoflurane and provide an adequate depth of anesthesia to allow tracheal intubation. The objective of this study was to compare the effects of two different doses of fentanyl on intubating conditions in adults, following inhalational induction with sevoflurane.

METHODS

This prospective, randomized, double blind study was carried out at King Abdul Aziz University Hospital, Riyadh (Saudi Arabia) from January-December 2007. After approval from the hospital ethical committee and informed consent, 56 ASA class I–II, adult patients between the ages of 18 to 65 years, scheduled for elective surgery under general anesthesia and endotracheal intubation were included in the study. We excluded patients with allergies to any of the drug used in this study, risk of pulmonary aspiration, anticipated difficult airway, body mass index > 30 kg/m2 and ASA classification III or higher.

All the patients were explained three breath vital capacity inhalational induction on pre operative visit. An IV line was established in all the patients 6 hours before surgery and DW5%+0.45% NaCl infusion started according to the hourly fluid requirements. All the patients were premedicated with oral midazolam 0.1 mg/Kg and oral ranitidine 150 mg two hours before surgery. Patients were randomly assigned to one of two groups (numbers out of an envelope). The patient and the first investigator were blinded to the dose of fentanyl which was diluted to a volume of 10 ml by an anesthetist who was not included in the study.

In the operating room, monitors like electrocardiogram and pulse oximeter, non-invasive BP at the interval of one minute were attached. All patients received IV glycopyrrolate 0.2 mg as an antisialogue and as prophylaxis against bradycardia. Inhalational anesthetic induction was started with a circle breathing circuit primed with 8% sevoflurane in 50% N2O and 50% oxygen with total flow of 8 L/min. Anesthesia was induced using the three breath vital capacity technique with 2 L reservoir bag. The anesthesia machine used was Datex Ohmeda® anesthetic delivery unit (AS/3-ADU). One minute after start of inhalational induction, patients in Group-I received 2 μg/kg and Group-II patients received 3 μg/kg of fentanyl IV respectively. After confirmation of loss of lid lash reflex, ventilation was assisted manually with positive pressure ventilation to keep end tidal carbon dioxide concentration (EtCO2) in the range between 30–35 mmHg. Four minutes after the start of inhalational induction, laryngoscopy was performed using Macintosh blade. A 7-mm endotracheal tube (ETT) was used for female patients and 8-mm ETT was used for male patients. After confirmation of proper ETT position, anesthesia was continued using sevoflurane in N_2O and O_2.

The parameters assessed were vocal cord opening, jaw relaxation, coughing and patient movement and were graded as shown in Table 1.

Table 1: Grading of various parameters studied.

Parameter	Grade			
	0	1	2	3
Vocal cord opening	open	less than 30 degree open	fully closed	-
Jaw relaxation	fully relaxed with no jaw stiffness	mildly stiff if stiffness was felt but did not affect mouth opening	moderately stiff if there was difficulty in mouth opening but it could be overcome with manual force	severely stiff if there was difficulty with mouth opening
Coughing	no cough	mild cough for less than ten seconds	moderate cough; ten to 20 sec	severe cough >20 sec

Patient movement was defined as any movement of the arms, legs or thorax.

Time to successful tracheal intubation was defined as the period between removal of the facemask and detection of CO_2 on capnograph.

Intubating conditions were defined as given in Table 2.

Table 2: Definitions of intubating condition.

Intubating condition	Definition
Optimal	The jaw was fully relaxed with partially to fully open vocal cords and no coughing at tracheal intubation

Good	The jaw was partially relaxed and/or there was mild coughing after tracheal intubation
Marginal	Moderate coughing after tracheal intubation, or if the jaw was moderately stiff
Poor	The jaw was severely stiff, the vocal cords were closed or there was severe coughing after tracheal intubation

Other variables measured included: 1) heart rate, BP, EtCO2, Et sevoflurane (Sev) concentration and SpO2 measured every minute; 2) time to loss of consciousness and 3) time to successful tracheal intubation. Hypotension was defined as systolic BP <80 mmHg and if noted was corrected with inj. ephedrine 5 mg IV doses. Bradycardia was defined as heart rate <60/min. Hypoxemia was defined as SpO_2 <90%.

Parametric data were analyzed using the Student's t test. Non-parametric data were analyzed using the Mann-Whitney rank sum test. Proportions were analyzed using Fisher's exact test. Hemodynamic responses were analyzed using repeated measures ANOVA. Sigma Stat 2.0. (SPSS, Chicago, IL, USA) was used for statistical analysis. P value <0.05 was considered statistically significant.

Results: Demographic data was similar for both groups (Table 3).

TABLE 3: Patient demographic data

	Group-I (N=28)	Group-II (N=28)
Age (yr)	40.6± 8.3	43.2 ± 11.6
Weight (kg)	71.1 ± 18.3	65.2 ± 10.4
Height (cm)	165.8 ± 7.1	168.1 ± 6.0
ASA physical status		
(I:II)	(13:15)	(16:12)
EtCO2 1 min before intubation (mmHg)	31.6 (30–33)	33(30–35)
Et sevoflurane (%) 1 min before intubation	6.2± 0.5	5.9 ± 0.8
Et sevoflurane (%) 1 min after intubation	5.6 (5.2–6.6)	5.5 (5.3–6.2)

Data expressed as mean ± standard deviation or median (25–75th percentile) where appropriate.

Induction of anesthesia with sevoflurane/N_2O was successful in all patients in both groups. Mean time to loss of consciousness was 47 sec in Group-I and 46 sec in Group-II (Table 4).

TABLE 4: Induction and tracheal intubation

		Group-I (N=28)	Group-II (N=28)
Time to loss of consciousness (sec)	46 ± 8	47 ± 6	
Jaw relaxation	-complete	24 (86%)	26 (93%)
	-mild stiffness	4 (14%)	2 (7%)
	-moderate stiffness	0	0
	-severe stiffness	0	0
Vocal cords	-fully open	21 (75%)	22 (79%)
	-partially open	7 (25%)	6 (21%)
	-closed	0	0
Successful tracheal intubation	28 (100%)	28 (100%)	
Time to successful tracheal intubation (sec)	32 ± 6	31 ± 9	
Coughing after intubation			
None (P=0.02)	17 (61%)*	25 (89%)*	
Mild	8 (29%)	3 (11%)	
Moderate	3 (11%)	0	
Severe	0	0	
Patient movement			
Before intubation	0	0	
After intubation	1 (4%)	0	
Intubating conditions			
Optimal (P <0.01)	15 (54%)*	25 (89%)*	
Good	10 (35%)	3 (11%)	
Marginal	2 (7%)	0 (0%)	
Poor	1 (4%)	0 (0%)	

No patient in either group coughed or moved during laryngoscopy. Mean time to successful tracheal intubation was similar at 32 sec for Group-I and 31 sec for Group-II. The incidence of post-intubation coughing was higher in Group-I (39%vs.11%) with P <0.02. Optimal intubation conditions were higher in Group-II (89%vs.54%) with P <0.01. Both groups had a high incidence of good to optimal intubating conditions (Group-I 89% and Group-II 100%). The incidence of hypotension during induction was 7% in each group and responded to a 5mg bolus of IV ephedrine (Table 5). No patient in any group developed bradycardia, hypoxemia or any other complication during tracheal intubation (Table 5).

TABLE 5: Complications and management

		Group-I
(N=28)	Group-II	
(N=28)		
Bradycardia	0 (0%)	0 (0%)
Hypotension during induction	2 (7%)	2 (7%)
Ephedrine bolus used (5mg each)	2 (7%)	2 (7%)
Hypoxemia during induction (SpO2 <90%)	0 (0%)	0 (0%)

DISCUSSION

The results of our study show that good to optimum conditions for tracheal intubation can be achieved within four minutes of anesthetic induction with 8% sevoflurane in 50% N2O and fentanyl in the dose of 2-3 μg/kg. However, patients who received fentanyl in the dose of 3 μg/kg had better intubating conditions compared to those who received fentanyl in the dose of 2 μg/kg. Both groups had a high proportion of good to optimal conditions for tracheal intubation (89% and 100% respectively). Our results are similar to Alaxander and co-workers' study in which propofol and alfentanil was used for tracheal intubation without neuromuscular blocking agents and it provided good to excellent intubating conditions in 85% of the patients (11). Iamaroon A and colleagues compared intubation conditions with sevoflurane (6% ET Sev.) with 50% N2O and that achieved with propofol in combination with succinylcholine. They observed comparable results.(12). Our results were very similar to the results of this study.

Adding narcotic analgesics during inhalation induction with 8% sevoflurane in 50% N2O improves intubating conditions and allows intubation slightly earlier provided there is no hypoventilation (10). Nathan and colleagues used alfentanil along with 8% sevoflurane and 50% N2O and it allowed intubation slightly earlier compared to the placebo group (10). They also found that increasing the dose of alfentanil provided better intubating conditions compared to the patients who received a lower dose. These results are comparable to our results.

To our knowledge the optimum dose of fentanyl that improves the intubating conditions in patients requiring inhalational induction has not been studied. Hwan S and colleagues used another narcotic analgesic ramifentanil in the dose of 2 μg/kg along with sevoflurane-N2O and achieved optimal intubating conditions at three minutes (13). Our comparison of fentanyl in two different doses demonstrated that the incidence of post intubating coughing was higher in Group-I than in Group-II, who received fentanyl in the dose of 3 μg/kg compared to 2 μg/kg.

There are contradictory results in literature regarding the incidence of hypotension during inhalational induction. In our study, we observed that the incidence of hypotension was 7% in both the groups which is lower than the previous finding in which the authors found a higher incidence of hypotension (27%) when sevoflurane was used with ramifentanil for the same objective (13). One factor leading to hypotension during induction is volume depletion due to preoperative fasting. The reason of decreased incidence of hypotension in our study may be due to the fact that we avoided volume depletion by infusing maintenance fluid during fasting period. However, in some studies, no hemodynamic instability was found during inhalational induction with sevoflurane (10,14).

Potential problems with the use of fentanyl during anesthetic induction include hypoventilation that is likely to slow the process of inhalational induction (10,15). Muzi and colleagues found that when narcotic analgesic was given before sevoflurane induction, it actually increased time to successful tracheal intubation due to hypoventilation leading to slowing the process of delivery of anesthetics to the lungs (16). We avoided hypoventilation caused by fentanyl by manually assisting the ventilation. We prevented expected severe bradycardia associated with administration of fentanyl following sevoflurane induction (17) with glycopyrrolate administered as prophylaxis before induction of anesthesia in patients in both groups (Table 5).

An advantage of the sevoflurane/fentanyl induction technique is the avoidance of neuromuscular blocking agents. Succinylcholine is commonly used to facilitate tracheal intubation. However, it is associated with side effects and may be contraindicated in some patients (18). Non de-

polarizing muscle relaxants with a rapid onset of action can be used as an alternative to succinylcholine, but these drugs may also be associated with undesirable effects like prolonged neuromuscular blockade, or inability to rapidly reverse the paralysis in cases of difficult intubation of difficult ventilation. Inhalational induction has advantage over IV induction in patients with anticipated difficult intubation (19-20). Spontaneous ventilation is preserved until fentanyl is administered. Should airway obstruction arise during induction of anesthesia, induction may be terminated and the patient allowed to wake up. If ventilation difficulties arise after fentanyl administration, its effects can be reversed with naloxone. This technique is especially important in surgical procedures in which use of muscle relaxants is to be avoided if intraoperative assessment of the integrity of the neuromuscular transmission is required by the surgeon.

CONCLUSION

We conclude that 3 μg/kg fentanyl with 8% sevoflurane in 50% N_2O - oxygen mixture, provide optimal intubating condition in four minutes. Tracheal intubation using sevoflurane, N_2O and fentanyl can be used as an alternative to traditional tracheal intubation with neuromuscular blocking agents.

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ORIGINAL ARTICLE

Safety of Tramadol as a Pre-Induction Agent

Tariq Hayat Khan, MCPS, FCPS.
Consultant Anesthesiologist & Pain Management Specialist, KRL General Hospital, Islamabad (Pakistan).

Correspondence: Dr. Tariq Hayat Khan, Consultant Anesthesiologist & Pain Management Specialist, KRL General Hospital, G-9/1, Mauve Area, Islamabad (Pakistan). Cell: +92 321 5149709; e-mail: tariqhayat-khan@hotmail.com.

ABSTRACT

Objective: To study the safety profile of intravenous use of tramadol immediately before induction of general anesthesia.

Design: Prospective, observational study.

Study Period: January 2005 to October 2007.

Setting: Combined Military Hospital Multan, Military Hospital Rawalpindi and Railway Hospital Rawalpindi.

Patients & Methods: 600 patients of ASA-I to ASA-III, aged 10-50 years, undergoing elective surgery were selected for the study under convenient sampling. Children less than 10 years were excluded. Morbidly obese and patients with history of syncope, convulsive syncope, panic attacks and other convulsive events were excluded. Ladies undergoing caesarian section were also excluded from the study. The patients were injected 1.5mg/kg body weight, but not exceeding 100mg of tramadol (100mg of the drug diluted to 10 ml) intravenously, slowly over a period of two minutes as a part of pre-induction regimen. Patients were monitored for any untoward signs and symptoms for 10 min and all observations were recorded.

Results: The main complications / side-effects observed were nausea / vomiting, sweating, heart sinking and seizures in that order. Out of 600 patients, 47 (7.83 %) patients complained of nausea alone and 9(1.5%) patients had a bout of vomiting, 23 (3.88%) patients were observed to have sweating, 31 (5.17%) female patients complained of heart sinking and 2(0.33%) patients had had seizure activity.

Conclusion: We conclude that although the use of IV tramadol as a pre-induction agent is associated with a low risk of side effects, but due to its potential to cause seizure activity, it is best avoided in the environments where adequate resuscitative measures are not available.

Keywords: Pre-induction, Tramadol, Safety, Seizure activity.

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INTRODUCTION

Tramadol is a cyclohexanol derivative with μ-agonist activity. It has been used as an analgesic for postoperative or chronic pain or as a part of balanced anesthesia since the late 1970s, and became one of the most popular analgesics of its class in many countries including Pakistan. International interest has been renewed during the past few years, when it was discovered that tramadol not only acts on opioid receptors, but also inhibits serotonin (5-hydroxytryptamine; 5-HT) and noradrenaline (norepinephrine) reuptake. Parenteral or oral tramadol has proved to be an effective and well-tolerated analgesic agent in the perioperative setting. Adverse effects are generally similar to those of opioids, although they are usually less severe, and can include respiratory depression, dysphoria and constipation. Some reports suggested that the drug may cause seizures especially in the presence of concomitant treatment with antidepressant agents.1 Studies suggested that the incidence of drug-induced seizures is rare, especially in the therapeutic dosage range. This study was designed to observe any untoward side-effect of tramadol injected intravenously for pre-induction before induction of general anaesthesia.

PATIENTS & METHODS

A prospective, observational study was conducted consecutively at three hospitals at Multan and Rawalpindi, from January 2005 to October 2007. 600 patients of ASA-I to

ASA-III, aged 10-50 years, undergoing elective surgery were included. Children less than 10 years were excluded as they were often given less than the projected dose of the tramadol, and for most of them it was hard to wait on the operating table for the observation period. On the other hand, patients over 50 years receive morphine as a preferred narcotic analgesic at the former two hospitals, hence were excluded. Patients with history of syncope, convulsive syncope, panic attacks and other convulsive events were excluded. Morbidly obese patients were also excluded, as were patients with full stomach. The selected patients were to undergo all types of surgeries under general anaesthesia, less obstetric patients scheduled to undergo Caesarian section. The demographic data is given in Table 1. The patients were injected 1.5mg/kg body weight of tramadol (100mg of the drug diluted to 10 ml) intravenously, slowly over a period of two minutes as a part of pre-induction. Total dose was not exceeded to 100 mg regardless of the weight of the patient. The induction was carried out after a lapse of 10 minutes. Patients who could not wait for the stipulated time even after intravenous administration of the drug, due to any reason were excluded. During this period patients were observed for any untoward signs. They were frequently questioned to about any unpleasant feeling. Blood pressure, ECG, SpO_2 and pulse rate were monitored with multi-parameter monitors. The observations were carefully recorded.

Table 1: DEMOGRAPHIC DATA

Total No. of Patients	600
Male/Female ratio	475/125 19:5
Age (Mean±SD)	34±14.7 years
Body weight (Mean±SD)	67.3±17.51 Kg
Dose of Tramadol	1.5 mg/kg Max: 100 mg
ASA status	I-III
Types of Surgery:	
General Surgery	371(61.83%)
Gynae/Obs	67(11.17%)
Orthopaedic Surgery	134(22.33%)
ENT Surgery	28(4.67%)

RESULTS: The main complications / side-effects observed were nausea / vomiting, sweating, heart sinking and seizures in that order. Out of 600 patients, 23 (3.88%) patients were observed to have sweating, 47 (7.83 %) patients complained of nausea alone and 9(1.5%) patients had a bout of vomiting. Out of 47 patients who felt nauseated, 36(6%) were females and the rest 11(1.83%) were males. 31 (5.17%) female patients complained of heart sinking, which was relieved by inj. midazolam 1-3 mg IV. One patient, a 25 years old male, developed frank seizures after about half the calculated dose had been injected. He was immediately injected pentothal, followed by suxamethonium and was intubated. Another male patient, aged 34 years, developed seizures immediately after the full dose of the tramadol had been injected. He, too, was induced rapidly and intubated. Thus 2(0.33%) patients had had seizure activity. The seizures were tonic-clonic in nature, started from the muscles of the face, were fine to start with, but rapidly developed into moderate intensity. There was no warning sign such as visual or auditory aura. Soon, whole body was in rapid jerky motion till it was terminated by injection of pentothal. Both of these patients had no history of convulsive disorders, and none of them was on any medication before the surgery. None of the patients complained of urticaria. The cut point for blood pressure change was set to be a 10% increase or decrease in the mean blood pressure from the baseline. Although slight decrease was noted, the effect on mean blood pressure or pulse rate was not significant. The summary of the observed untoward side effects is given as Table 2.

TABLE 2: Incidence of complications

Complication	Incidence	M:F
Sweating	23 (3.88%)	17:6 (3.58%:4.8%)
Nausea	47 (7.83 %)	11:36 (5.47%:16.8%)
Vomiting	09 (1.5%)	1:2 (1.3%:2.4%)
Heart sinking	31 (5.17%)	0:31 (0%:6.4%)
Seizures	02 (0.33%)	2:0 (0.42%:0%)

DISCUSSION

Tramadol is a synthetic analogue of codeine. It is a central analgesic with a low affinity for opioid receptors. Its selectivity for μ-receptors has recently been demonstrated, and the M1 metabolite of tramadol, produced by liver O-demethylation, shows a higher affinity for opioid receptors than the parent drug. The rate of production of this M1 derivative (O-demethyl tramadol), is influenced by a polymorphic isoenzyme of the debrisoquine-type, cytochrome P450 2D6 (CYP2D6). Nevertheless, this affinity for mu receptors of the CNS remains low, being 6000 times lower than that of morphine. Moreover, and in contrast to other opioids, the analgesic action of tramadol is only partially

inhibited by the opioid antagonist naloxone, which suggests the existence of another mechanism of action. This was demonstrated by the discovery of a monoaminergic activity that inhibits noradrenaline (norepinephrine) and serotonin (5-hydroxytryptamine; 5-HT) reuptake, making a significant contribution to the analgesic action by blocking nociceptive impulses at the spinal level. (+/-)-Tramadol is a racemic mixture of 2 enantiomers, each one displaying differing affinities for various receptors. (+/-)-Tramadol is a selective agonist of mu receptors and preferentially inhibits serotonin reuptake, whereas (-)-tramadol mainly inhibits noradrenaline reuptake. The action of these 2 enantiomers is both complementary and synergistic and results in the analgesic effect of (+/-)-tramadol. The recommended daily dose of tramadol is between 50 and 100mg every 4 to 6 hours, with a maximum dose of 400 mg/day; the duration of the analgesic effect after a single oral dose of tramadol 100mg is about 6 hours. Adverse effects, and nausea in particular, are dose-dependent and therefore considerably more likely to appear if the loading dose is high. The reduction of this dose during the first days of treatment is an important factor in improving tolerability. Other adverse effects are generally similar to those of opioids, although they are usually less severe, and can include respiratory depression, dysphoria and constipation2.

International interest has been renewed during the past few years, when it was discovered that tramadol not only acts on opioid receptors, but also inhibits serotonin (5-hydroxytryptamine; 5-HT) and noradrenaline (norepinephrine) reuptake. Tramadol has been used intraoperatively as part of balanced anaesthesia. Such use is under discussion, however, as it was associated with a high incidence of intraoperative recall and dreaming, and postoperative respiratory depression has been described after intraoperative administration of high doses.

Although many studies have been conducted regarding safety and usefulness of peri-operative tramadol in children[3-5], we have noticed a general tendency among our anaesthetists to use tramadol in comparatively lower doses than were used for age group in our study.

Nausea and vomiting are the most frequently reported adverse effects. In controlled studies, haemodynamic and respiratory parameters were only minimally impaired. The risk of severe respiratory depression in typical dosages is negligible in comparison with other opioids used for postoperative pain management. [6-7]

Scott and Perry reported an incidence of 1.6 to 6.1% of nausea, dizziness, drowsiness, sweating, vomiting and dry mouth. They showed no clinically relevant effects on respiratory or cardiovascular parameters at recommended doses in adults or children8. In our patients the incidence of these side effects was 1.5 to 7.83%, the most frequent being mild to moderate nausea (7.83%) and the least common being frank vomiting (1.5%). An interesting finding was the complaint of heart sinking (5.17%), which was readily controllable with small doses of IV midazolam. No patient complained of dizziness or drowsiness.

Tramadol has been associated with seizure activity, perhaps due to its monoamine uptake inhibition and serotonergic modulating properties. A large number of studies have been conducted to study this activity during the last decade or so. Previous US studies suggest a relatively low risk of seizures with tramadol, unless it is taken by people with epilepsy or taken with other drugs that reduce the seizure threshold.[9-10] Analysis of administrative data from a large U.S. managed care population, a cohort of 9218 adult tramadol users and 37,232 concurrent nonusers showed fewer than 1% of users had a presumed incident seizure claim after the first tramadol prescription. Risk of seizure claim was increased 2- to 6-fold among users adjusted for selected comorbidities and concomitant drugs. Risk was highest among those aged 25-54 years, those with more than four tramadol prescriptions, and those with history of alcohol abuse, stroke, or head injury[11].

Labate and Newton mentioned in their study, that the seizures were generalized tonic–clonic, without auras or focal features. In their study no patient had a prior history of seizures, and none had a recurrence since they had ceased taking tramadol[12]. This was consistent with our study. Both patients in our study developed seizures of generalized tonic-clonic type, and had no previous history of seizures and no previous exposure to the drug.

Much of the toxicity in tramadol overdose appears to be attributable to the monoamine uptake inhibition rather than its opioid effects. Agitation, tachycardia, confusion and hypertension suggest a possible mild serotonin syndrome. The serotonergic modulating properties of tramadol mean that it has the potential to interact with other serotonergic agents. There is an increased risk of serotonin syndrome when tramadol is taken in combination with reuptake inhibitors (e.g. selective serotonin reuptake inhibitor-SSRIs), agents that potentiate the effect of 5-HT (e.g., monoamine oxidase inhibitor-MAOIs) or 5-HT agonists[13].

There is still controversial data about pro- or anti-convulsant effect of tramadol in vitro, some researches demonstrated that tramadol has anticonvulsant effect in mice but there are many reports of tramadol-induced seizures in humans [14]. Seizures have been reported in patients receiving the drug in overdose and, rarely, at the recommended dose unless it is taken by people with epilepsy or taken with other drugs that reduce the seizure threshold [15].

The smallest amount of tramadol associated with seizure was 200 mg, and 84.6% of seizures occurred within 6 hours administration. In a general population, there is association between seizures and tramadol use in males, long-term therapy, suicide attempts, intentional abuse or misuse, and tachycardia 16. Most of these studies were conducted with long-term use of the drug via oral route. We have not seen a study in which adverse effects and especially seizure activity was noted after single parentral administration.

Out of 600 patients in our study, only two patients (0.33%) developed seizures, both with no previous history of convulsive episodes. It was also noted that the seizure activity occurred within therapeutic range on first exposure. In our set-up, we had full means of resuscitative measures within reach, and the patients were scheduled to undergo general anaesthesia, which was readily induced and the seizure activity was immediately controlled. But although the incidence of this activity is low, the clinicians must be cautious while injecting tramadol intravenously in outdoor settings or where resuscitative measures are not readily available.

CONCLUSION

The use of IV tramadol as a pre-induction agent in balanced anaesthesia technique is safe and associated with a low risk of side effects, but the IV use of drug can produce tonic-clonic seizures in a very small population of patients and hence, probably best avoided in the environments where adequate resuscitative measures are not available.

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ORIGINAL ARTICLE

Comparative study of oral erythromycin-ranitidine combination and metoclopramide-ranitidine combination in reducing residual gastric fluid volume and acidity in elective surgery

Shahbano Afzal, MD, Naseem Ali Sheikh, MBBS, FCPS, Waseem Ismat Chaudhry, MBBS, FCPS, Diplomat of The Board in Anaesthesia (I.R) ***, Zahid Iftikhar, MBBS, DA****.*

**FCPS Trainee (4th year),*
***Assistant Professor,*
****Professor& Head, Dept of Anesthesiology,*
*****Anesthetist. Dept of Anesthesiology Unit-II, Shaikh Zayed Hoapital, Lahore (Pakistan)*

Correspondence: Dr. Shahbano Afzal, 433-F, Johar Town,, Lahore (Pakistan). Ph No: +92-42-5171029, Cell: +92-306-4466-718, E-mail: shahbano72@yahoo.com

ABSTRACT

Background: Prokinetic agents and H-2 receptor antagonists are commonly used to decrease the volume and increase the pH of the gastric fluid. This study was conducted to compare the effect of oral erythromycin–ranitidine combination and metoclopramide–ranitidine combination in reducing gastric fluid volume and acidity in patients undergoing elective surgery.

Methodology: 80 patients were divided into two groups by convenient sampling technique after meeting inclusion criteria; Group A was given oral erythromycin 250 mg-ranitidine 150 mg while group B was given oral metoclopramide 10 mg-ranitidine 150 mg two hours before surgery. Gastric fluid was aspirated with orogastric tube after induction. Volume and pH of the gastric fluid were determined.

Results: Data analysis of our study showed statistically significant reduction in mean gastric fluid aspirate volume in group A (3.4ml+2.3 vs. 7.2ml+3.1). (P-value = 0.001 and T-value = 6.24). There was no statistically significant difference between the two groups as far as increase in gastric pH was concerned (6.5+1.6 vs. 6.2+1.3). (T-value = 0.925 / Two tailed P-value = 0.36). In both the groups' gastric pH was increased from the average normal value (0.3-2.9).

Conclusion: Combination of erythromycin-ranitidine is more effective than metoclopramide-ranitidine in reducing the gastric aspirate fluid volume and thus in prevention of acid aspiration syndrome.

Key words: Erythromycin, Ranitidine, Metoclopramide, Residual gastric fluid volume, Residual gastric fluid acidity.

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INTRODUCTION

Pulmonary aspiration of gastric contents has been one of the major causes of anesthesia-related deaths. Different methods have been advocated to reduce the volume and acidity of the residual gastric fluid, including: overnight fasting, use of prokinetic drugs, H-2 receptor antagonists, proton pump inhibitors and antacids1. The prokinetics agents available include erythromycin2 and metoclopramide3, and this property has led these to be used in patients with diabetic gastroparesis. Erythromycin4 in low doses reduces gastric fluid volume when given as a premedication drug prior to surgery. Studies show that metoclopramide alone or in combination with H-2 receptor antagonists causes reduction in gastric fluid volume and acidity5. But unfortunately it has extra pyramidal side effects. Ranitidine is H-2 receptor antagonist and increases the pH of gastric fluid. It is in use as chemoprophylaxis

before induction of anesthesia to reduce the risk of acid aspiration syndrome.

In this study we aimed to compare the effect of oral erythromycin-ranitidine combination with metoclopramide-ranitidine combination in reducing residual gastric fluid volume and acidity in patients undergoing elective surgery.

MATERIAL AND METHOD

The study was conducted after the approval of ethical committee in the Department of Anaesthesia and Intensive Care Unit, Shaikh Zayed Hospital, Lahore. It was a quasi experimental study. A total of 80 patients, ASA I and II were enrolled from either sex, aged 20 – 50 years, scheduled to undergo elective surgery under general anesthesia. It was convenient sampling. Pregnant patients, those with history of gastrointestinal disease or extra pyramidal signs, patients taking H2 blockers, proton pump inhibitors, antacids or other drugs with known effects on gastric fluid volume and pH were excluded. Written informed consent was obtained from each patient during preoperative visit. Patients were selected on preoperative visit, no routine premedication was given and patients were asked to be nil by mouth at least six hours before surgery. On operation day, in the preoperative area patients were divided into two groups; Group A received combination I (tablet erythromycin 250 mg with tablet ranitidine 150 mg), while Group B patients received combination II (tablet metoclopramide 10 mg with tablet ranitidine 150 mg) with 10 ml of water two hours before surgery.

In the operating room, a standardized anesthesia technique was followed for each patient. ECG, heart rate and blood pressure was monitored. Induction of anesthesia was done by injection sodium thiopentone 5mg/kg, injection atracurium 0.6mg/kg. After intubation, anesthesia was maintained with isoflorane 0.5 – 1%, 40 % oxygen and 60% nitrous oxide. Then a multi-orificed orogastric tube (18 French) was passed and its correct location was confirmed by pushing air with 50 ml syringe and auscultation over the epigastrium. Before the commencement of the surgery, gastric fluid was aspirated and measured with a 50 ml syringe in the head down position. The pH of the aspirate, collected in a sterile bowl was measured with pH meter. Those patients with incomplete measurements were excluded from the study.

The data was entered and analyzed through statistical software SPSS version 10. Data analysis consisted of two steps. The mean fluid volume and mean pH with standard deviation was calculated for each combination of drug. Mean gastric fluid volume and pH were compared with each combination and statistical test ANOVA was applied. For comparison of proportions of categories of fluid volumes Chi–square test was applied.

RESULTS

80 patients were included in our study. They were divided in two groups i.e. 40 patients to each group. Group A was of Erythromycin–Ranitidine combination while group B was of Metoclopramide–Ranitidine combination. Data analysis of our study showed statistically significant reduction in gastric fluid aspirate volume in group A where mean volume was 3.4 ml as compared to group B where mean volume was 7.2 ml (P-value = 0.001 and T-value = 6.24). There was no statistically significant difference between the two groups as far as increase in gastric pH was concerned (T-value = 0.925 / Two tailed P-value = 0.36 which is greater than 0.05). In both the groups' gastric pH was increased from the normal value (0.3-2.9). Analysis of the demographic profile (Mean age / Mean weight / Gender) showed no statistically significant difference.

Data analysis of our study showed that mean gastric fluid volume was significantly reduced with erythromycin–ranitidine combination as compared to metoclopramide–ranitidine group. Mean aspirate volume with group A (erythromycin–ranitidine) was 3.4 ml (standard deviation = 2.3) as compared to group B (metoclopramide – ranitidine) where mean aspirate volume was 7.2ml (standard deviation = 3.1).This was shown to be statistically significant difference (p value less than 0.001 and t value 6.24). Qualitative analysis of the data also confirmed our observation. In group A (erythromycin–ranitidine) gastric fluid aspirate volume less than or equal to 10 ml was observed in 39 patients (97.5%) while only 1 patient had gastric fluid aspirate volume greater than 10ml (2.5%). While analyzing group B (metoclopramide–ranitidine) 34 patients (85%) had gastric fluid aspirate volume up to 10mls and 6 patients (15 %) had gastric fluid volume greater than 10 ml. Comparison of both groups again showed statistically significant difference (fisher exact one tailed P value was 0.05). Proportion of more than 10 ml gastric aspirate was significantly higher in group B as compared to group A.

Mean gastric pH

Our study showed that there was no significant difference in gastric pH between the two groups (t-value = 0.925 / two tailed P-value = 0.36 which is greater than 0.05). Mean gastric pH was 6.5 for group A (standard

deviation = 1.6) while for group B mean gastric pH was 6.3 (standard deviation = 1.3). So no statistically significant difference in mean gastric PH was observed when comparing Erythromycin-ranitidine combination with Metoclopramide-Ranitidine combination as pre-anaesthetic medication to increase gastric pH.

Qualitative analysis of the data showed that in group A (erythromycin–ranitidine) pH of less than or equal to 5 was observed in 3 patients (7.5%) while the remaining 37 patients (92.5%) had pH greater than or equal to 5. Where as in group B (metoclopramide–ranitidine) 5 patients (10.0%) had pH less than or equal to 5 and 35 patients (90.0%) had pH greater than or equal to 5. Comparison of both the groups showed no statistically significant difference in high or low pH of gastric fluid aspirate (fisher exact one tailed P value was 0.356).

Comparison of mean ages

While considering the demographic profile, no statistically significant difference was observed while comparing the mean ages between the two groups (t-value = 0.285 / two tailed p-value = 0.776 which is greater than 0.05). Mean age in group A (erythromycin-ranitidine) was 30.8 years (standard deviation = 10.6) while in group B (metoclopramide-ranitidine) was 31.4 years (standard deviation = 9.6).

Gender status under study

Gender status of the patients under study also did not show any statistically significant difference (Chi-square value = 0.267 / Two tailed p-value = 0.606 which is greater than 0.05). In group A (erythromycin-ranitidine) 9 patients (22.55%) were females while 31 patients (77.5%) were males. In group B 11 patients (27.5%) were females while 29 patients (72.5%) were males.

Comparison of mean weights

Comparison of mean weight between the two groups did not reveal any statistical significant difference (t-value = 0.308 / two tailed p value = 0.551 which is greater than 0.05). Mean weight in group A was 63.9 kg (standard deviation = 11.4) while in group B was 62.3 Kg (standard deviation = 12.06).

Table I: Comparison Of Mean Gastric Fluid Volume And Ph

	A	*B*	*p-value*
Mean Aspirate volume (ml) + SD	3.4+2.3	7.2+3.1	0.001
Mean gastric PH(ml) + SD	6.5+1.6	6.2+1.3	0.36

Table 2: Qualitative Analysis Of Comparison Of Volume Of Gastric Fluid Aspirate

Groups / *Volume of gastric aspirates*	*A (Erythromycin-Ranitidine) N (%)*	*B (Metoclopramide-Ranitidine) N (%)*	*Fishers Exact one tailed p value*
Up to 10 ml	39 (97.5%)	34(85.0%)	0.05
More than 10 ml	1(2.5%)	6(15.0%)	0.05

Table 3: Qualitative Analysis Comparison Of Ph Of Gastric Fluid Aspirate

Groups / *pH range*	*A (Erythromycin -Ranitidine) N(%)*	*B (Metoclopramide-Ranitidine) N(%)*	*Fishers Exact one tailed p-value*
PH < 5	3(7.5%)	5(10%)	0.356
PH > 5	37(92.5%)	35(90%)	0.356

DISCUSSION

The results of our study show that erythromycin-ranitidine group significantly decreased the volume of gastric fluid aspirate as compared to metoclopramide-ranitidine group. No significant difference in pH was noted between the two groups, yet it was significantly increased in both groups from the normal gastric pH (0.3-2.9)6. Hence combination of erythromycin-ranitidine was found to be more efficacious as it caused more decrease in the gastric residual fluid volume as compared to metoclopramide-ranitidine group.

The volume and acidity of the gastric contents are a result of gastric secretion, oral intake and gastric emptying. Traditionally a value of 2.5 for gastric pH and 25 ml (or0.4 ml/kg) for gastric fluid volume has been taken as a cut off value for development of aspiration syndrome7-8. it has been reported from animal studies that a very low pH (less than 1), and breast milk or a dairy formula, predisposed to an increased severity of aspiration pneumonitis compared with less acidic content or a soya-based milk. More recently Soreide E et al9 reported that for passive regurgitation and pulmonary aspiration to occur during anaesthesia more than 200 ml of gastric fluid volume is needed in adult patients, while in a healthy patient for elective surgery only 10-30 ml of gastric fluid are present. They also reported that in patients with gastro-oesophageal reflux or if vomiting occurs, even smaller gastric volumes may be pushed into the trachea. In both the groups that we studied the values were significantly lower than the values required for causing aspiration syndrome.

The prokinetic effects of erythromycin and metoclopramide is well established now10, 11. Combination of

erythromycin and metoclopramide therapy has been shown to be more effective than erythromycin alone in improving the delivery of nasogastric nutrition12. Mclaren R et al13 in their study showed that both erythromycin and metoclopramide can be used to facilitate gastric emptying and erythromycin seemed to be more effective than metoclopramide for enhancing gastric motility. Our results are consistent with the above mentioned studies confirming the effectiveness of erythromycin over metoclopramide when used as a prokinetic agent.

Although there was no statistically significant difference noted in both our study groups in mean pH value yet in both the groups the gastric pH was well above the cut off value of 2.5. A pH <2.5 was observed in 4 cases (3 belonged to erythromycin-ranitidine group while only 1 to metoclopramide-ranitidine group). Hong JY et al14 in their study evaluated the effect of IV metoclopramide and ranitidine on preoperative gastric contents in patients receiving IV anaesthesia for laproscopic gynaecologic surgery. They found mean gastric pH of 6.8 in patients given ranitidine thus concluding that ranitidine was useful in increasing pH of gastric contents. The literature thus supports our findings as mean gastric pH was increased in both our study groups and the quantitative increase was almost similar to the findings reported in the literature.

In our study blind aspiration through nasogastric tube was done to measure the volume of gastric content. Although this method is commonly employed, it results in incomplete emptying of the stomach and therefore underestimates gastric fluid volume. This may also explain why in our study we found mean gastric aspirate fluid volume to be much less than that reported in the literature (29+10 ml)9. Modern methods for measuring gastric emptying e.g. paracetamol absorption test, gastric emptying scintigraphy etc. can accurately quantify the prokinetic effect of these drugs.

CONCLUSION

We conclude that erythromycin-ranitidine combination is more effective than metoclopramide-ranitidine combination in reducing the gastric fluid volume. Both combinations significantly increase pH from the values quoted to cause acid aspiration injury.

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INTRODUCTION

Residency programs are increasingly required to provide performance based assessments to document clinical skills, and OSCE are one of the best methods to assess these skills. An OSCE is a timed, multistation examination in which learners perform tasks such as interviews, physical exams, clinical/ resuscitative procedures and counseling in

ORIGINAL ARTICLE

OSCE as an Assessment Tool: Perceptions of Undergraduate Medical Students

Shamsunnisa Sadia, MCPS, FCPS, Saadia Sultana, MCPS, FCPS *, Fareesa Waqar, FCPS**.*

**Assistant Professor,*
***Professor and Head of Department*
Department of Obstetrics & Gynecology, Islamic International Medical College-Trust, Railway Hospital, Rawalpindi (Pakistan).

Correspondence: Dr. Shamsunnisa Sadia, Assistant Professor, Department of Obstetrics & Gynecology, Islamic International Medical College –Trust, Pakistan Railway Hospital, Rawalpindi (Pakistan).
E-mail: naadeems@yahoo.com

ABSTRACT

Objective: To describe the perceptions of undergraduate medical students regarding Objective Structured Clinical Examination (OSCE) and its comparison to Multiple Choice Questions (MCQ), essay questions and viva voce.

Methods: This cross-sectional survey was carried out at Islamic International Medical College Rawalpindi (Pakistan), from 3 December 2008 to 2 January 2009. We used a questionnaire comprising of a total of 12 items, out of which 8 items were regarding the quality of exam (Likert scale), 3 regarding the difficulty, being educative and fairness of OSCE relative to other methods of assessment and last one regarding its acceptability as a method to assess clinical skills for undergraduate medical students. The questionnaire was distributed to students of 4th and 5th year medical students to be filled and returned for assessment of the responses.

Results: One twenty seven students completed the questionnaire. The results of the study showed that the exam was stressful for 51% of the respondents. About 81% thought that performance of tasks during OSCE was interesting and educative. OSCE, essay type, MCQ and oral viva examination were perceived easy by 44, 33, 18 and 5% students, educative by 32, 16, 23 and 30% and fair by 43, 13, 32 and 11% respectively.

Conclusion: OSCE is well-received and acceptable to undergraduate medical students of Pakistan as a method to assess clinical skills.

Keywords: OSCE, Medical students, Clinical skills, Examination, Assessment.

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realistic settings. At each station learner performance is evaluated with specific checklists or global rating scales, completed by faculty members and/or standardized patients. OSCE's enable the same clinical scenarios to be presented to many trainees and have become the gold standard for performance-based assessment. The College of Physicians and Surgeons Pakistan (CPSP) has already inculcated objective structured assessments in its medical post graduate diploma awarding examinations. In due course of time the Pakistan Medical & Dental Council is expected to ask all examining bodies to incorporate such structured assessment methods into undergraduate medical examinations as well. Medical students are assessed by OSCE both at the end of clinical rotation and final professional examinations by the Department of Obstetrics and Gynecology, Islamic International Medical College Rawalpindi. A lot has been said about the pros and cons of OSCE as an assessment tool - . But information regarding the perceptions of the medical students in this context is lacking. We conducted this survey to ascertain the

perceptions of undergraduate medical students regarding OSCE and its comparison to MCQ's, essay type questions and viva voce.

METHODS:

In this cross-sectional survey we used a questionnaire, which was distributed among 4th and 5th year medical students of Islamic International Medical College Rawalpindi, to be filled and returned back. The questionnaire had three parts; Part one contained 8 questions regarding the quality of exam which answered on a four point Likert scale (1=strongly agree, 2=agree, 3=disagree, 4=strongly disagree). Part two consisted of 3 items regarding the difficulty, being educative and fairness of OSCE relative to other methods of assessment (MCQ, essay type questions and oral viva). Finally, part three had one item regarding the acceptability of OSCE as a method to assess clinical skills for undergraduate medical students (Table 1). Analysis was done by descriptive statistics using SPSS version 15.

Table 1: The questionnaire

PART I – OSCE vs VIVA (Regarding OSCE answer as: A- Strongly agree; B- Agree; C- Disagree; D- Strongly disagree)					
No.	Item	A	B	C	D
1.	Exam designed fairly				
2.	Exam organized properly				
3.	Exam was so stressful	Exam was easier than oral			
4.	Exam was easier than oral				
5.	I received adequate information before appearing in the exam				
6.	The instruction of each station were as expected				
7.	The time was enough for each station				
8.	Performing of tasks at each station was interesting and educative				

PART II

(Tick ONE option)

No.	*ITEM*	*OSCE*	*Viva*	*Essay Questions*	*MCQ*
1.	Easy				
2.	Educative				
3.	Fair				

PART III

(Tick ONE option)

No.	*ITEM*	*Yes*	*No.*
1.	OSCE is an acceptable method to assess practical clinical skills for undergraduate medical students		

RESULTS:

One twenty seven (4th and 5th year) undergraduate medical students completed the questionnaire. The results of the study showed that 88% respondents thought that the exam was designed fairly, 80% thought that it was organized properly and 76% opined that it was easier than oral viva. According to 72% of the respondents adequate information was given prior to the examination. Instructions for each station were found to be as expected by 67%. About 81% thought that performance of tasks during OSCE was interesting and educative. However, OSCE was stressful for 51% of the students (Table 2). The 5 minute allocated time for each station was found to be insufficient by 57% of students. OSCE, Essay, MCQ and oral viva examination was perceived easy by 44 %(n=56), 33 %(n=42), 18 %(n=23) and 5 %(n=6) students respectively. OSCE, Essay, MCQ and viva examination were considered educative by 32(n=40), 16(n=20), 23(n=29) and 30 %(n=38) respectively, and fair by 43(n=55), 13(n=17), 32(n=41) and 11 %(n=14) respectively (Table 3). Eighty four percent (n=107) of the students were sure that OSCE was an acceptable method to assess practical clinical skills for undergraduate medical students. However, OSCE was unacceptable to 15% (n=19) of the respondents. One student left this item unanswered.

Table 2: Quality of performance testing

No.	*Strongly Agree N (%)*	*Agree N (%)*	*Disagree N (%)*	*Strongly Disagree N (%)*
1	47(37)	65(51.2)	11(8.7)	4(3.1)

2	29(22.8)	73(57.5)	18(14.2)	7(5.5)
3	24(18.9)	67(52.8)	27(21.3)	9(7.1)
4	22(17.3)	63(49.6)	27(21.3)	15(11.8)
5	28(22)	37(29.1)	55(43.3)	7(5.5)
6	20(15.7)	34(26.8)	52(40.9)	21(16.5)
7	41(32.3)	55(43.3)	25(19.7)	6(4.7)
8	23(18.1)	80(63)	18(14.2)	6(4.7)

Table 3: OSCE relative to other methods of assessment

Item no.	*OSCE N(%)*	*Essay question N(%)*	*MCQ's N(%)*	*Viva voce N(%)*
Easy	56(44)	42(33)	23(18)	6(5)
Educative	42(33)	20(16)	29(23)	36(28)
Fair	55(43.3)	17(13.4)	41(32.3)	14(11)

DISCUSSION

Medical students perceived OSCE as an acceptable method and fair examination in comparison to MCQ, essay questions and oral examination. The results of this study showed that our medical students had a positive attitude towards OSCE as an alternative to assess clinical skills. Similar level of acceptance has been described in other studies as well [3-6].

Although 51% of the students found OSCE to be stressful, more than 80% felt that it was educative, interesting and fair tool of assessment. Other studies[7] also reveal that the OSCE is one of the most anxiety-provoking assessment method and students prepared more for the OSCE than for the other examinations[4]. However, in spite of being elevated in nearly all forms of assessment methods, anxiety is not predictive of performance outcome in the OSCE. Almost half of the respondents stated that the allocated time of 5 minutes per station was not enough however, more than 70% perceived that the examination was properly organized with adequate instructions both prior to and during examinations.

In our study, the students rated OSCE to be better than MCQ, essay type questions and viva voce in terms of being educative and fair. Interestingly, the largest number of students felt that OSCE was easier than the other three methods of assessment. These findings are supported by other surveys too [5].

CONCLUSION

The results of this study support the perception that OSCE is acceptable to undergraduate medical students of Pakistan as an alternative method to assess clinical skills.

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CASE REPORT

Drainage of Ludwig's Angina in a Pregnant Patient under Superficial Cervical Plexus Block

Arun Kumar Gupta, V.K.Dhulkhed*, B.M.Rudagi**, Ana Gupta**

**Dept of Anesthesiology*
*** Dept of Oral & Maxillofacial Surgery*
Rural Medical College, Loni.
Maharashtra, (India). 413736

***Address for Correspondence:** Dr.Arun Kumar Gupta, Assistant Professor,Dept Of Anesthesiology, Rural Medical College, Loni, Maharashtra (India). 413736.*
Phone no: +919823262700; Email: guptaarun71@gmail.com

ABSTRACT:

Objective:
To compare the safety and efficacy of Dongsulin R with (rDNA) human insulin (Humulin R) in patients with type I or type II diabetes mellitus.

Methodology:
Forty patients with type I and type II diabetes, already on (rDNA) human insulin with or without OHA were included in a single blind comparative trial between Dongsulin R and Humulin R. Blood glucose was checked thrice daily before meals.

Results:
Treatment groups had similar baseline blood glucose levels. The mean changes in blood glucose level values thrice daily before meals were not statistically significant between two groups. After 12 days of treatment, blood glucose level in both groups was reasonably well controlled. No side effects were observed during this period.

Conclusions:
Dongsulin R is equally safe, efficacious and well tolerated as Humulin R brand.

Key words: Dongsulin R, Humulin R, Diabetes mellitus, Blood glucose levels.

INTRODUCTION

Ludwig's angina is defined as a potentially lethal, rapidly spreading cellulitis, involving the sublingual and submandibular spaces, and is manifested by a brawny suprahyoid induration, tender swelling in the floor of the mouth, and elevation and posterior displacement of the tongue.1

The most common cause of Ludwig's angina is an odontogenic infection from one or more grossly decayed, infected teeth, and is usually as a result of native oral streptococci or a mixed aerobic-anaerobic oral flora.2 Prompt airway management is critical, but the presence of swelling of the neck, glottic edema, elevation of the tongue, trismus, or pharyngeal edema create formidable problems.3

It is a life threatening condition, yet an extensive literature search did not yield much published information regarding its occurrence in the pregnant patients.

CASE REPORT

A 20-year old primigravida, at 30 weeks gestation, presented to our hospital with complaints of facial swelling. She described that her pregnancy had been uneventful, except for a seven-day history of lower left quadrant tooth pain, and a three-day history of fever and chills. Her clinical examination revealed a large soft tissue swelling under her mandible, extending bilaterally to the angles of the mandible and inferiorly up to her hyoid bone. On presentation, her vital signs were: temperature 38.7°C, blood pressure 125/54, pulse 116/min, respiratory rate 19/min, oxygen saturation on room air 96%, and white cell count of 16800/μL. The diagnosis of Ludwig's angina was made.

It was difficult to perform an adequate oral exam due to pain, swelling, and severe trismus which allowed her to open her mouth to only 15 mm (average range 40–45

mm). The patient had difficulty in containing her own salivary secretions because of dysphagia, but had no dyspnea. Since in similar situations patients may desaturate very quickly, even though her oxygen saturation was recorded to be 96% on room air, she was given supplemental oxygen and a pulse oximeter was attached. An emergent cricothyrotomy kit was kept available at the patient's bedside at all times. We formally consulted the Department of Obstetrics and Gynecology, understanding that in administering medications and/or undergoing any surgical treatment in pregnancy, one must consider the risks and the benefits both to the mother and the unborn, it was determined that the benefits of proceeding with emergent and immediate surgical intervention outweighed the risks.

Securing an airway via an awake fiberoptic nasal intubation was risky: a fiberoptic tube inserted into the pharynx might puncture an abscess and cause pus aspiration or swallowing. It was thus decided to attempt a trial of decompression under superficial cervical plexus block. Complete preparations for an emergency tracheostomy were also undertaken.

Standard monitors were attached. The patient was placed in a supine position, with her head turned to the right side. Under aseptic technique, lidocaine 1% was infiltrated at the midpoint of the line connecting the mastoid process with Chassaignac's tubercle of C6 transverse process. Then inj.buvipacaine 0.5% 8ml was injected after negative aspiration using a fan technique along the posterior border of sternocleidomastoid muscle which reduced the pain and enabled the patient to open mouth more widely. An inferior alveolar nerve block was then performed by maxillofacial surgeon intraorally.

Dense anesthesia was established in about 7 min. A rapid decompression of the left submandibular region was done and the mylohyoid transected with resultant lowering of the floor of mouth, the blunt dissection continued through the mylohyoid muscle to the sublingual areas to access all loculations. Lower left three molars were then extracted since it was believed that these grossly carious and partially impacted teeth were the primary source of the infection. Upon removal, purulence was expressed through the extraction socket. There was little discharge from the wound, which was lightly packed and dressed. Post op fetal heart sound was monitored by fetal Doppler. After four days, she was discharged, to be followed up at Departments of Oral & Maxillofacial Surgery and Obstetrics & Gynecology.

DISCUSSION

The unique anatomy of the floor of the mouth plays an important role in the development and extension of intraoral infections. The usual infectious course begins with a periapical dental abscess of the second or third mandibular molar. The roots of these teeth extend inferior to the insertion of the mylohyoid muscle, so that if untreated, the infection may continue from primary spaces to penetrate the thin inner cortex of the mandible and will involve the posterior margin of the mylohyoid muscle to the submandibular space. At this point, the infection may develop and progress at such an alarming rate that special precautions regarding airway maintenance must be taken.[4] It is estimated that about 50,000 women require anesthesia and a surgical intervention each year at some time during gestation for indications unrelated to the pregnancy.[5] In such situations, when medical and surgical treatments for pregnant women are considered, both the physiologic changes of pregnancy and the perinatal effects of the treatment must be considered.[6] Pregnancy is accompanied by physiological changes which place the mother at a higher risk of infection or of doing worse once infected. First, the immune response is greatly diminished during pregnancy, thus resulting in rapid progression of an infection. Secondly, there is decreased neutrophil chemotaxis, cell mediated immunity, and natural killer cell activity.[7,8] Moreover, approximately 50% of pregnant women complain of some degree of dyspnea by 19th week of gestation7 and there is some depletion in the oxygen reserve of the gravid patient. This could increase fetal hypoxia during periods of hypoventilation.6 From an oral perspective, as pregnancy associated hormonal changes begin to affect a woman's body, the gingival tissues are affected as well. They become much more sensitive and thus susceptible to irritation from soft plaque. The plaque accumulates, becomes hard calculus deposits on the teeth, and harbors bacteria in large numbers resulting in a constant, low-grade intraoral infection. Maternal infective processes sustained especially by gram negative anaerobic bacteria, such as those leading to Ludwig's angina, have been demonstrated to cause physiologic imbalance through inflammatory cytokine production, sometimes resulting in preterm labor, premature rupture of membranes, and low birth weight.[9] Dur-

ing pregnancy, women tend to have frequent meals and snacks, which augment plaque accumulation, as well as an increase in decay or rapid progression of previously present decay. A remote infection can at times infect the placenta, uterus, and possibly the fetus, causing fetal septicemia. During a life threatening infectious situation such as the one described, the risk of maternal and fetal morbidity may overshadow potential teratogenic side effects during early pregnancy.[10]

In an exhaustive review of the literature, from 1945 to 1979, 75 cases of Ludwig's angina were found, and the authors strongly advocate elective tracheostomy under local anaesthesia.[11] Cellulitis of the neck with involvement of the tracheostomy site may make it a more difficult option. Moreover, surgical dissection of the fascial planes in the neck may actually open and contaminate the pathways, leading to life-threatening mediastinal invasion.[12]

Other options for airway management include orotracheal, blind nasotracheal, and fiber optic intubation or cricothyroidotomy with jet insufflation. We chose to employ a cervical plexus block as anesthesia for surgical decompression. The block permitted a thorough incision and drainage, including transection of mylohyoid with lowering of the floor of mouth and rapid relief of respiratory obstruction. Ling et al also recommended the consideration of superficial cervical plexus block, and if necessary an auriculotemporal nerve block to manage selected patients with difficult airways who present for drainage of dental abcesses.[13] Moshe et al advocated superficial cervical plexus block with concomitant mandibular nerve block with a high success rate, low complication rate and high patient acceptance rate for the drainage of submandibular and submental abscesses.[14]

Ludwig's angina is life threatening because of risks of septicemia and asphyxia. Furthermore, in pregnancy, the condition itself as well as possible therapies may put the mother and her unborn child at increased risk.

CONCLUSION

Superficial cervical plexus block combined with mandibular nerve block can safely be employed for the surgical decompression in a case of pregnant patient with Ludwig's angina.

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CASE REPORT

Battered baby syndrome: a case report

Misbah Durrani, MCPS, FCPS, Mahjabeen Mahmood Kamal, MCPS, FCPS**, Naeem Ahmed, MBBS***, Mobeen Jawad, MCPS, FCPS, FRCR*****

**Senior Registrar in Radiology, **Assistant Prof. and Head of Department (Radiology), Rawalpindi Medical College/DHQ Hospital, Rawalpindi (Pakistan).*

****PG. Paediatrics. Holy Family Hospital RWP*

*****Consultant Radiologist, CMH Rawalpindi*

Correspondence: Dr. Mahjabeen Mahmood Kamal, Assistant Professor of Radiology, Rawalpindi Medical College/D.H.Q. Hospital Rawalpindi (Pakistan). E-mail- mahjabeenmahmood@hotmail.com

ABSTRACT

A case of battered baby syndrome of an 11 month old first born baby is reported, which was found to be due to a psychological condition of the mother called acute postpartum depressive psychosis. The child was brought to the emergency with history of fall from the bed. Skull fractures were detected on CT scan but no brain injury. Later on the same baby was brought to the pediatric department with history of fits. CT scan was repeated and based on the CT findings and history the injuries were found out to be due to repeated shaking and beating by the mother.

KEYWORDS: Battered baby syndrome, Computed tomography (CT scan), Skull fractures, Cerebral hemorrhage.

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INTRODUCTION

The term 'battered baby syndrome' is defined as a clinical condition, usually in children under 3 years of age, who have suffered non-accidental injury, on one or more occasions, by an adult in the position of trust usually a parent, a guardian or a foster parent1. In addition to the physical injury, there may be deprivation of nutrition, care and affection in circumstances which indicate that such deprivation is not accidental. It is very common to find the discrepancy between the history and clinical findings.1

We received such a case, who reported to us for a repeat CT scan of brain. Initially the condition went unrecognized and on second time the child was found to have severe cerebral damage. Her mother was later diagnosed to have suffered from acute postpartum depressive psychosis after her first delivery.

CASE REPORT

An 11 months old male baby, first born of orphaned young parents, belonging to the low socioeconomic class was brought to the emergency department of DHQ Hospital Rawalpindi, with a history of fall from the bed. An emergency CT scan was done which showed right parietal bone fracture. However, the underlying brain tissue was found normal as shown in Fig. 1 and Fig. 2. Patient was discharged after conservative treatment.

Few days later, the child was brought to the pediatric department of Holy Family Hospital, Rawalpindi, with a history of fits. A repeat CT scan was ordered and the patient was referred to our department (Radiology Department of DHQ hospital Rawalpindi) for the same. On general physical examination of the patient, he was a well fed and properly dressed baby boy. He had an apparently large head with a measured head circumference of 28 cm and an evidence of frontal bossing. He couldn't hold his head. There was also evidence of bilateral nystagmus.

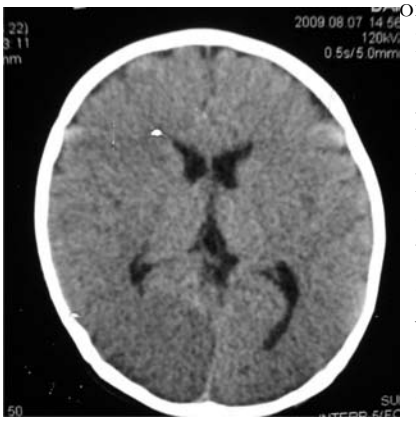
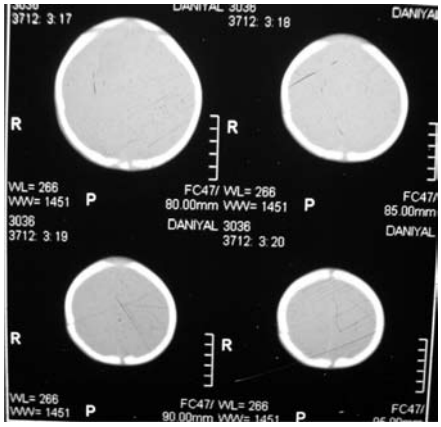


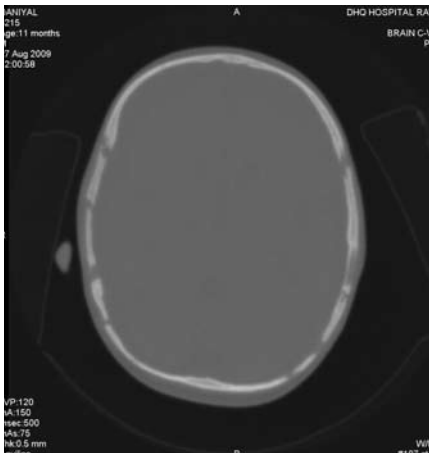
Fig.1. Normal brain tissue.

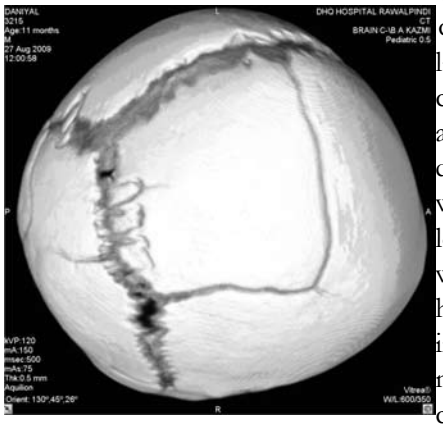
CT showed the previous skull fracture as well as new fractures involving right parietal and occipital bones.

There were cortical parenchymal calcifications in the parietal and occipital lobes bilaterally. Bilateral subdural hygromas and cerebral atrophy was also seen. (Fig. 3 and 4).

3D reconstruction images of the skull, show fractures in Fig 5 and 6.







No clinical history or radiological evidence of cerebral infection was seen. A contrast enhanced scan was also done, which ruled out abnormal meningeal enhancement. Based on the CT findings and previous history of trauma a suspicion of battered baby syndrome was made. A skeletal survey of the baby, however, did not reveal any other injuries to the bones. A detailed history was taken from the mother and father. The mother got married at the age of only 14 and conceived 2 months later. Her pregnancy went unremarkable and baby was delivered at home with the help of a local 'Dayi' (midwife). According to her, she was looking after the baby normally when she conceived again just three months after her first delivery. She started having episodes of depression and became quite irritable. She started beating up the baby, often violently shaking him. These episodes of depression and beatings continued till the second baby boy was born. When the couple came to our department, the mother was carrying her 7 days old baby in her arms.

The patient was sent back to the paediatric department with the diagnosis of battered baby syndrome. After a few days, the patient was again sent to our department for another CT scan as his head circumference was progressively increasing. It was 33 cm at that time. A suspicion of hydrocephalus had been raised and placing a VP shunt was being considered. The CT, however, showed no evidence of hydrocephalus, but significant encephalomalacia was noted (Fig 7).

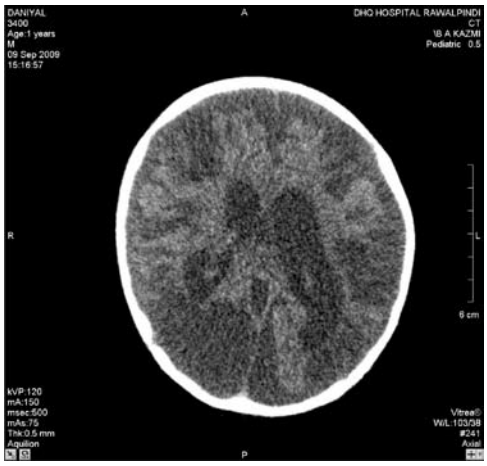


Fig.7. Extensive encephalomalacia.

Baby was managed conservatively and was later discharged. Mother was referred to the Psychiatry Department for psychiatric evaluation, where she was diagnosed as suffering from acute postpartum depressive psychosis. She was admitted for management.

DISCUSSION

In the west, battered bay syndrome is the most common cause of serious injuries in children aged less than 1 year. It is the third most common cause of death in children after sudden infant death syndrome and true accidents. In the United States 1.7 million cases were reported in 1990.[2]

Kempe and his co-workers introduced this term in 1962 to characterize a clinical condition in children, usually younger than 3 years of age, who suffered from serious physical abuse. According to him, this syndrome should be considered in any child exhibiting evidence of fracture of a bone, subdural haematoma, failure to thrive, soft tissue swelling or skin bruises, in any child who

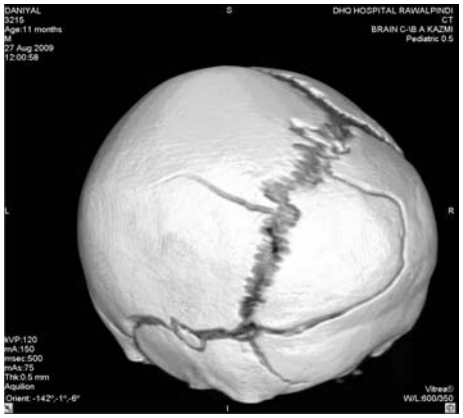


Fig. 6: Multiple skull fractures.

dies suddenly, or when the degree and type of injury is at variance with history given[3].

In eastern culture, babies are considered as a gift from God and cases of battered baby syndrome are rare. However, instances of ill treatment of young children working as domestic servants are on record, where employers have beaten some children with sticks or burned them with a pair of hot tongs. The crime comes to light only when such children complain to someone who knows their mother tongue[4].

Battered baby syndrome should be suspected in all children younger than one year of age, who present with drowsiness, coma, seizures or apnea. A combination of subdural hematomas, retinal haemorrhages with minimal or no trauma and no coagulopathy are pathognomonic of this syndrome. The injuries are caused by shaking with or without impact. Physical signs of violence are often absent and this syndrome may be mistaken for a serious infection or seizure disorder5. In this syndrome, along with occasional beating, the baby is also held by the thorax and shaken violently. This causes a repetitive acceleration and deceleration trauma which leads to typical intracranial bleeding, eye injuries, skull fractures and rib fractures. Many cases are fatal and lead to seizures and neurological disability including blindness. Cerebral palsy, mental retardation or epilepsy may occur in about 60% of the children.5

These intracranial haemorrhages are thought to be caused by the easily torn bridging veins of infant's head. The infant's head and blood vessels are particularly vulnerable to vigorous shaking because of the relatively large head and weak neck muscles, the abundance of unmyelinated brain tissue, which permits excessive stretching of the brain and vessels, and the increased pliability of the skull as compared to the rigidly fixed internal structures such as falx cerebri.6

In an infant, anything but a non-widely spaced simple linear fracture of the parietal bone should be viewed with suspicion and regarded as a non-accidental injury until proven otherwise. Such fractures include depressed, stellate, comminuted and other complex fractures7. In children under 2 years of age, a skeletal survey may be done to find other fractures. Skeletal trauma can be seen in 50-80% of cases.2

Ophthalmic examination of children with suspected battered baby syndrome is important for the prognostic as well as diagnostic purposes. Diffuse bleed seen on the optic fundus, vitreous hemorrhage or sub-hyloid haemorrhage are usually associated with worse visual outcome8. Non-reactive pupils and midline shift of the brain structures correlate highly with mortality and more severe neurologic injury. Of the survivors, up to 60% may have neurological sequelae which include seizures, cerebral palsy and blindness.5

Visceral injuries, secondary to abdominal trauma (punch, kick) can be the second leading cause of death in child abuse, usually seen in children more than 2 years of age. Intestinal injuries are the most commonly reported intra-abdominal lesions in battered children. Intramural haemotoma of the duodenum or jejunum is well documented.2

There is a spectrum of the consequences of battered baby syndrome and less severe cases may not be brought to the attention of medical professionals. A victim of sub-lethal shaking or beating may have a history of poor feeding, vomiting, lethargy and/or irritability occurring for days or week. Signs of battered baby syndrome may vary from mild and nonspecific to severe and immediately identifiable clinically. In the most severe cases, which usually result in death or severe neurologic consequences, the child usually becomes immediately unconscious and suffers rapidly escalating life threatening CNS dysfunction.5

A recent WHO estimate shows that 40 million children in the world aged 0-14 years are abused and neglected. These children require both health care and social care.9 The awareness regarding these aspects has recently raised concern among health professionals and enlightened citizens, specially in the advanced countries, where the problem has been reported to have increased to ten folds in the last decade.10 In third world countries with poorer societies, continuous socioeconomic stress induces the parents to abuse their children.11 It is however, imperative that any case, before being labeled as battered baby syndrome, should be thoroughly investigated and all possibilities of accidental injuries should be ruled out.

The role of radiological examination is undeniable in detection of skeletal injuries in these children and must be sought in conjunction with a thorough history to rule out other disease conditions.

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CASE REPORT

Antigravity lift technique is helpful in difficult intubation in patients with large goiters

M Iqbal Memon, M Ashraf***

** Professor, **Associate Professor*

Dept. of Anesthesiology & Intensive Care,

Pakistan Institute of Medical Sciences, Islamabad (Pakistan).

Correspondence: Professor M Iqbal Memon, Dept. of Anesthesiology & Intensive Care, Pakistan Institute of Medical Sciences, Islamabad (Pakistan). Cell: e-mail:

ABSTRACT

Abstract: A 45 years old female with huge goiter presented for thyroidectomy. She had history of snoring and dysnea, airway evaluation revealed Mallampatti 2, IIG 3F, but temporomendibular distance (TMD) and sternomendibular distance (SMD) were impossible to measure due to grossly enlarged thyroid. Radiological examination revealed displacement of trachea towards right. After induction and depolarizer relaxation laryngoscopy was performed and Cormack Lehane 4, POGO zero was observed. With our technique of antigravity lifting, vocal cords were visualized making intubation possible with endotracheal tube on stylet.

Key words: Difficult airway; antigravity lift

INTRODUCTION:

Difficult or even failed intubation can be a major source of morbidity and mortality in clinical practice, particularly in patients with large goiters, depending upon the size of the swelling and associated compression of airways. The later constitute an aggravating factor for difficult intubation. We present a case report of a patient, who was anticipated as a case of difficult laryngoscopy and intubation. The patient presented for thyroidectomy in a camp with huge goiter and due to non-availability of fiberoptic device, we planned to manage the intubation as mentioned. We used the technique of antigravity lift technique devised by the authors in post earthquake 2005 period.

CASE REPORT:

A young female of 45 years, presented for thyroidectomy with huge goiter (in euthyroid status) producing compressive symptoms, i.e. snoring and dyspnoea (Fig 1). Airway evaluation revealed Mallampatti II and inter-incisor gap of 3 fingers; TMD and SMD could not be measured due to enlarged thyroid. Radiological examination revealed an endothoracic goiter and displacement of trachea on right side (Fig 2) but without any compression. Deviation of trachea was defined as midline deviation of more than 1 cm. (1).

In the operating room difficult airway trolley was arranged and patient's NIBP, SpO2, and ECG were monitored. After pre-oxygenation for five minutes, anesthesia was induced with propofol 2.5 mg/Kg followed by suxamethonium 100mg. Patient was difficult to ventilate even after placing Gudel's airway. On laryngoscopy, Cormack Lehane 4, POGO zero was noted. An assistant had already been explained the technique to support lateral margins of swelling and lifting against the gravity with gentle pressure (Fig 3). With this technique of antigravity lift, vocal cords were visualized and intubation was easily accomplished with 7.0 mm endotracheal tube threaded on a stylette. Correct positioning of endotracheal tube was confirmed by bilateral auscultation. Thyroidectomy was performed with patient in supine position with the head slightly extended. At the end of the pro-

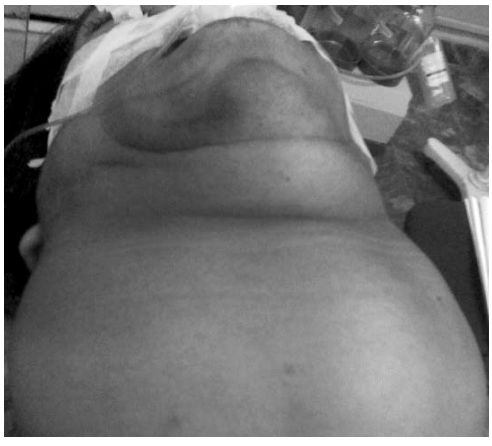
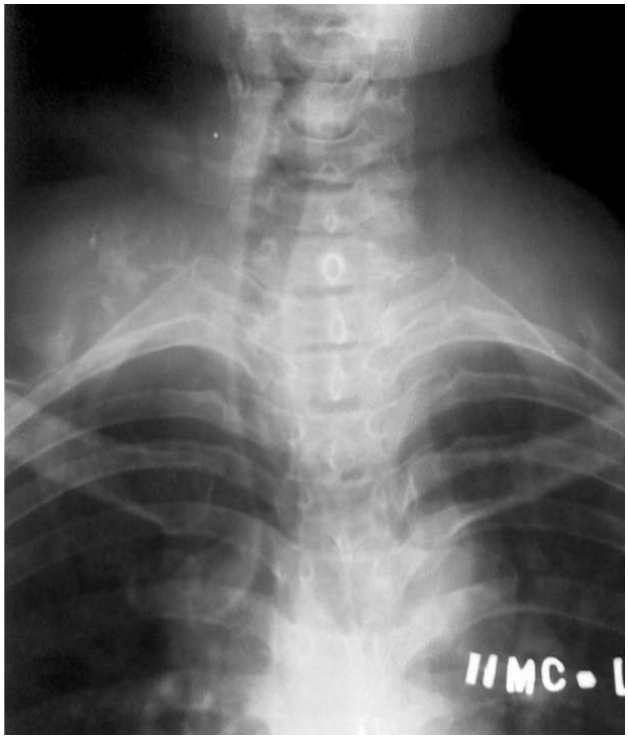


Figure 1: Picture showing the size and extent of the goiter

cedure patient was reversed with standard drugs in practice. After return of spontaneous breathing and response to verbal command, extubation was performed. Intubation related injury to right tonsillar pillar was noted. Patient was shifted to PACU for monitoring.



DISCUSSION:

Goiter when accompanied by tracheal compression constitutes an important risk factor for difficult airway, but usually no resistance is encountered in passage of the endotracheal tube through the compressed portion of the trachea. (2-5) In a comparative study of goiter patients with patients having no evidence of any risk factor, incidence found for difficult airway was 6.8% vs. 0.9%. (3). In another study, patients undergoing thyroid surgeries were evaluated by IDS (1). Overall incidence was found to be 11.1 % in goiter patients. (6) Whereas percentage of difficult intubation with an IDS>5 (moderate to major difficulty of intubation) was found as 5.3% and the rate of easy tracheal intubation (IDS= 0) was 36.9%. 57.8% had minor difficulty with intubation. The factors associated with goiter linked to DEI were cancerous goiter, tracheal deviation or compression, and presence of dyspnea (7). Many articles have been published suggesting that goiter, when accompanied by airway deformity, constitutes an aggravating factor for DEI. (3, 4, 8).Intubation difficulty is commonly identified as risk factor for morbidity and mortality (9). The airway management in these cases varies according to signs, symptoms, clinical and radiological findings. Common technique for managing difficult laryngoscopy is posterior displacement of the larynx by putting backward pressure on the thyroid or cricoid cartilage (BACK maneuver). This maneuver reduces the incidence of failure to view any portion of the glottis from about 9.2% to 1.6% (10). Displacement of the larynx in three specific directions: (a) posteriorly against the cervical vertebrae (b) as far superior as possible and (c) slightly laterally to the right (BURP) (11-13) and the use of a stylette or bougie have all been tried. Fiberoptic devices have revolutionized the management of difficult airway in many situations.

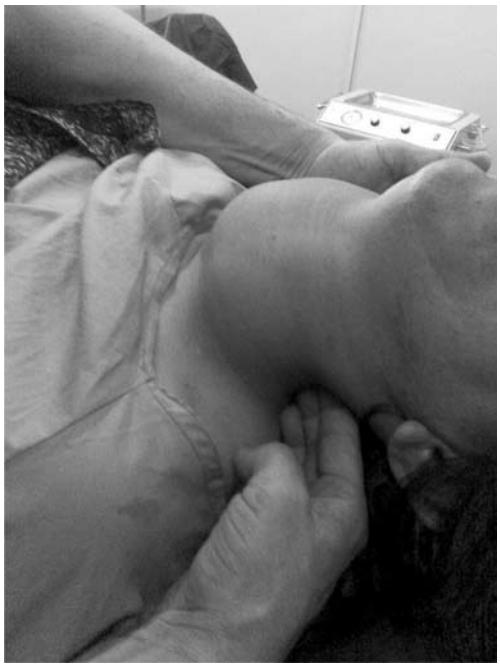


Figure 2: AP radiograph shows marked deviation of the trachea but no constriction or compression

In cases with very large goiters, where BACK and BURP are not possible i.e. trachea is collapsed under influence of relaxant and weight of swelling, our presently reported technique consisting of antigravity raising of goiter can improve glottis exposure and ease the intubation to secure the airway. We have successfully managed three similar patients using this technique in our practice till now.

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CASE REPORT

Emergency surgical management of a massive anterior mediastinal teratoma in a neonate

Ilyas Bader, Mansoor-ul-Haq**, Shahida Tasneem***, Anwar****, Naeem Khan*****,*
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**Assistant Prof of Anesthesiology, Foundation University Medical College, Rawalpindi (Pakistan)*
****HOD, Dept of Anesthesiology ***** Prof & HOD, Dept of Pediatric Surgery*
KRL General Hospital, Islamabad (Pakistan).
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Corrspondence: Professor Naeem Khan, Dept of Pediatric Surgery, KRL General Hospital, Islamabad (Pakistan). Cell: +92-3335103606; e-mail: prnaeem@me.com

ABSTRACT

Generally an anterior mediastinal teratoma is diagnosed because of space occupying effect which produces respiratory distress and pneumonic episodes. However there have been few reports where there was the need to address the problem soon after birth (Fig.1) because of severe respiratory compromise2,3. This was also the case in our patient. A full term baby who had to be transferred from 1000 Km. distance because of none availability of neonatal surgical facility there. He was transported with respiratory support after having been diagnosed on a plain x-ray and on MRI. (Fig.2,3,4). Emergency resuscitation and management resulted in successful outcome. Details of treatment are presented in this care report.

Key words: **Anterior Mediastinal Teratoma, Neonatal Respiratory Distress, Midline Sternotomy.**

INTRODUCTION

Teratomas are tumors which mostly arise from all three germ layers components. Mediastinal teratoma may originate from sequestered embryonic cell rests and are about 7 to 10% of all the teratomas. In thoracic tumors space occupying effect producing respiratory distress may the reason for early diagnosis. Early excision of tumor is desirable because the delay in diagnosis and management is directly proportionate to the higher incidence of malignancy. In case of mediastinum these tumors are mostly mature and benign. However, it is not the malignant nature of tumor but the respiratory compromise which may dictate the urgent or expedient removal to prevent morbidity and mortality, as was the case in our patient.

CASE REPORT

A full term normally delivered male, born near Multan (1000Km from Islamabad) developed severe respiratory distress soon after birth, for which patient had to be intubated and given assisted breathing. On clinical examination there was anteriorly bulging chest with marked tachypnea (Fig.1). On plain x-rays of the chest there was a large opacity occupying almost entire pleural cavities (Fig.2, 3). An urgent MRI revealed multilocuilated and multicystic mass in the anterior mediastinum (Fig.4), which had markedly compressed the lungs and heart (Fig.4). He was transported to neonatal intensive care unit of KRL Islamabad on assisted ventilation. During overnight stay with us he developed severe bradycardia on two different occasions and had to be resuscitated6. Following morning under endotracheal general anesthesia, emergency thoracotomy through midline sternotomy was performed. A large semi cystic and semi solid tumor which had displaced the mediastinal structure widely laterally posteriorly and inferiorly, was removed easily because it had not invaded any adjacent viscera. As soon as the tumor was removed patient's vital sign immediately improved. Post operative recovery was uneventful and patient only require oxygen through nasal tube for 24 hours. Following this feeding was started through nasogastric tube. Except for some serous discharge from sternal wound, (Fig.5) recovery was uneventful. Because of

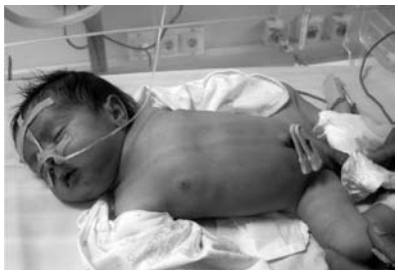

Fig.1: Markedly bulging chest requiring constant oxygen therapy.

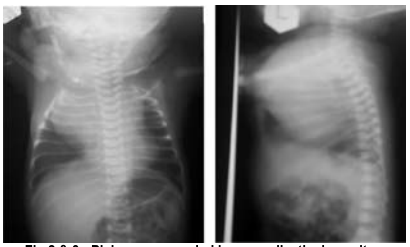

Fig.2 & 3: Plain x-ray revealed large mediastinal opacity pushing the lungs in laterally and down words. Note horizontal splaying of the webs.

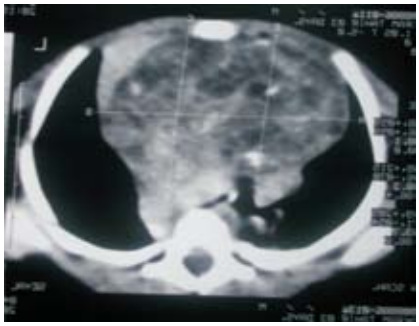

Fig.4: CT further elucidates the anterior mediastinal lesion obscuring the cardio shadow and producing cardio pulmonary functional compromise.

emergency nature of the problem we could not perform pre operative alpha fetoprotein levels, but after follow up of three years (Fig.6) patient remain well with normal chest x-ray and normal level of alpha fetoprotein.

DISCUSSION

In most mediastinal teratomas of infancy the predominant symptoms is respiratory compromise and distress. This is because of space occupying effect of the tumour which impedes optimal cardiopulmonary function. Some infants will develop repeated episode of pneumonic illness because of obstructive airways caused by space occupying effects of anterior mediastinal teratomas and further investigation may be required to identify the cause. With the improvement of imaging studies earlier and definitive diagnosis of this tumour has become more common. Majority of teratomas in this region tend to be mature and benign, but delay in surgical excision is directly proportional to higher incidence of malignancy. In children whose tumor is removed after the age of one year there is 80% chance of malignant transformation. Therefore it is desirable to do excision as early as possible to relieve symptoms and malignant transformation. Various centers now repot surgical excision in early infancy. However, we could find removal of tumor soon after birth being reported only once before1,5. We had to operate on our patient on the fifth day of his birth because of life threatening cardio pulmonary functions compromise. Midline sternotomy provided direct access to the tumor as well as better exposure than in the cases where we had previously approached these tumors from lateral thoracotomies. Direct view also made it easier for us the separation of tumor from adjacent structures and no adjacent organs were invaded. On detailed histopathology of the tumor no yolk sac elements were found4. Therefore it has been assumed that it was a mature tumor and the fact that he is alive and well after three years, further reinforces this assumption. Further more very early excision and consistent normal alpha fetoprotein levels are indicators that the child may have been cured6.

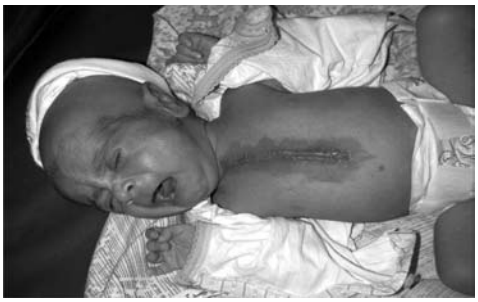

Fig.5: Midline sternotomy scar, mercurochrome was applied because here was some serious discharge

In summary there may be two reasons why this tumor should be should be excise early. One is repeated respiratory obstructive symptoms. Secondly earlier the tumor is removed the less is the chance of malignant transformation. Approach through midline sternotomy seems to have offered a better exposure for direct approach to the tumor.

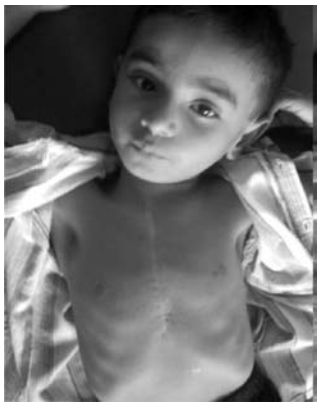

Fig.6: Three years later child is alive and well with minimal visibility of sternotomy scar

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LETTER TO EDITOR

Naegleria Meningitis: an Emerging Challenge

Managing infections in an Intensive Care Unit have always been a challenge for the intensivist, especially central nervous system related infections, which have significant morbidity and mortality; it often requires extensive intensive care management.

Amebic meningoencphalitis is a rare entity, but when it occurs it can be lethal. It is of two types' primary amebic meningoencephalitis (PAM) and granulomatus amebic encephalitis (GAE). PAM is caused be Naegleria fowleri (brain-eater), which is a free living ameba, and may lead to acute fulminant meningoencephalitis leading to death 3-7 days after exposure1. Naegleria is a thermophile protozoon; survives in waterways contaminated by thermal discharge from power plants, warm fresh water like swimming pool, but rarely lead to disease. In the United State 33 cases were reported in a 10 year period from 1998-2007 and all with fatal outcome2. Infection commonly occurs from July to August. The common route of entry is through nose; water containing organism moves in the nose, then migrates to brain through cribriform plate along olfactory nerves1. Symptoms are usually nonspecific similar to bacterial meningitis2. There is no rapid detection test for this organism. Diagnostic test involves CSF study with direct visualization of naegleria under light microscope which are actively motile. Indirect hemagglutination, ELISA etc. are other methods of diagnosis. MRI is usually suggestive of cerebral edema. As it has a very rapid clinical course, the patient dies with ambiguous clinical diagnoses; treatment is usually late they and the disease enters into non-responsive stage. The drugs of choice are amphotericin-B, rifampicin and tetracycline; some clinicians use fluconazole as well for better results3. Surgical intervention has only supportive role.

During the recent years, we have an incidence of total eight patients with meningoencepalitis who had a short history of headache, fever and neck rigidity. Most of these patients were young and active with no any previous illness. They came from different parts of Karachi city. All were admitted to intensive care unit after placement of endotracheal tube due to low GCS and the need for mechanical ventilation. They developed brain death within 24 to 48 hours. There CSF wet mount showed the presence of Naegleria infestation. CT scan showed gross dilatation of ventricles and midline shift. One patient had coning as well. Unfortunately, the incidence of this infection is increasing, and in 2009 we came across four patients in a single month.

This is a rare but fatal disease and requires a high degree of suspicion for its quick diagnosis. Awareness can lead early detection and early start of treatment which might save the lives. After six patients were reported in the US in 2007, CDC with coordination of Council of State formed 'Naegleria Workgroup' to determine the causes and plan for future action. Other countries also need to make special committees of concerned authorities to highlight this issue and produce awareness in the people as well as healthcare staff. Swimming pools should be surveyed for the infection as prevention is better than cure. Water related activities should be avoided in warm fresh water during periods of high water temperature and low water levels. Whenever there is a suspicion of mixing of sewerage water with drinking water, it should not be used. Role of health related NGO's is important for public awareness program. In the hospitals a detailed history with suspicion of meningitis will help in diagnosis. We need to formulate some guidelines for correct diagnosis and early treatment. CSF cytology of wet mount should be considered. Prophylactic use of amphotericin-B may help to improve survival.

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CLINIQUIZ

Spinal Hypotension

Tariq Hayat Khan

Hypotension following administration of spinal analgesia is a reality. Anesthesiologists have been trying various regimens to prevent and mange spinal hypotension, including preload with crystalloids/colloids, use of ephedrine/phenylephrine/adrenaline etc.; but uptill now no satisfactory technique has met the universal consensus. Controversy exists. Test your knowledge by selecting the most appropriate choice from the following questions:

QUESTIONS

1. Spinal hypotension may be produced by;
   a. Resultant sympathetic blockade causing peripheral vasodilatation
   b. Direct effect of local analgesics on peripheral vessels
   c. Reduced myocardial contractility
   d. Depressed cardiac conduction and excitability
   e. All of the above
2. Which intravenous solution is the best for preloading a patient before spinal analgesia?
   a. Haes-Steril
   b. Normal saline
   c. 5% Dextrose in water
   d. Ringer's solution
   e. All of the above
3. Which ionotropic agent is the drug of choice in spinal hypotension?
   a. Ephedrine
   b. Phenylephrine
   c. Adrenaline
   d. None of the above
   e. All of the above
4. Which physical measure is the best in prevention of spinal hypotension?
   a. Left lateral tilt
   b. Head down position
   c. Lower limb compression
   d. All of the above
   e. None of the above
5. The marker of optimum control of BP during caesarean deliveries under spinal analgesia is;
   a. Maternal systolic BP
   b. Maternal mean BP
   c. Umbilical arterial pH
   d. All of the above
   e. None of the above
6. Spinal bupivacaine can be associated with;
   a. Cardiac arrhythmias
   b. Cardiac arrest
   c. Seizers
   d. All of the above
   e. None of the above
7. The risk factors of hypotension include;
   a. Old age
   b. Level of analgesia
   c. Body mass index
   d. No prehydration
   e. All of the above
8. The risk factors of bradycardia include;
   a. Baseline heart rate less than 60 beats/min
   b. Age > 40 years
   c. Hypertension
   d. All of the above
   e. First two only

ANSWERS

1. e. Sympathetic blockade occurring during spinal anesthesia may result in peripheral vasodilation and hypotension, the extent depending on the number of dermatomes blocked. At blood concentrations achieved with normal therapeutic doses, changes in cardiac conduction, excitability, refractoriness, contractility, and peripheral vascular resistance are minimal. However, toxic blood concentrations depress cardiac conduction and excitability, which may lead to atrioventricular block, ventricular arrhythmias and cardiac arrest, sometimes resulting in fatalities. In addition, myocardial contractility is depressed and peripheral vasodilation occurs, leading to decreased cardiac output and arterial blood pressure. Allergic-type reactions are rare and may occur as a result of sensitivity to the local anesthetic. These reactions are characterized by signs such as urticaria, pruritus, erythema, angioneurotic edema (including laryngeal edema), tachycardia, sneezing, nausea, vomiting, dizziness, syncope, excessive sweating, elevated temperature, and, possibly, anaphylactoid-like symptomatology, including severe hypotension.

2. a. A Cochrane Review found that four of fifteen interventions reviewed reduce the incidence of hypotension under spinal anaesthesia for caesarean section: crystalloid versus control, pre-emptive colloid administration versus crystalloid, ephedrine versus control, and lower limb compression versus control. They however, concluded that no intervention reliably prevented hypotension during spinal anaesthesia for caesarean section.5% dextrose in water will only increase the water content of the plasma as dextrose is rapidly metabolised, and will result in hypotonicity of the blood.1

3. d. No significant differences in hypotension have been seen between ephedrine and phenylephrine and phenylephrine is more effective than controls. Ephedrine, although commonly used for this purpose, is associated with dose-related maternal hypertension and tachycardia, and fetal acidosis of uncertain clinical significance. Prophylactic ephedrine is more effective than control for preventing hypotension during spinal anesthesia for elective Cesarean delivery but a clinically relevant positive effect on neonatal outcome was not observed. Usually, either drug is given alone but combinations of phenylephrine and ephedrine appear to have no advantage compared with phenylephrine alone when administered by infusion for the prevention of hypotension associated with spinal anesthesia for cesarean delivery. Adrenaline will rapidly restore blood pressure to normal level, but may also result in hypertension, tachycardia, dysrrhthmias, anxiety and sweating in a dose related manner. Its use is precluded in cardiac patients. The best agent to mange maternal spinal hypotension is probably phenylephrine as it most closely meets the criteria for the best vasopressor in obstetrics, but in other cases either drug may be used with confidence.1-3

4. d. The supine position is dangerous in pregnant women at term because of aortocaval compression by the gravid uterus. Therefore, the parturient should be maintained in the left lateral decubitus position if possible or manual displacement of the uterus off the great vessels be accomplished. Head down position in pregnant women is not recommended as it can result in increased aortocaval compression and is unsuitable for the operating surgeon. However, it could be employed in non-pregnant or male patients after fixation of the local analgesic has taken place. Leg compression with electronic devices or with bandages, stockings or inflatable boots will result in increased venous return to heart and cardiac output.

5. d. Systolic BP is commonly employed for this purpose, although the other two are comparatively better indices. Fetal umbilical pH is a sensitive index of maternal and fetal circulation adequacy, but is rather difficult to measure and is time consuming.

6. d. Hypotension, bradycardia, nausea, vomiting, dysrhythmia and seizer activity, all have been associated with spinal analgesia, especially with bupivacaine.4

7. e. The incidence of spinal hypotension increases with increasing age and analgesic level > or = T4 dermatome. Other factors related to hypotension after spinal anesthesia are body mass index > or = 30, caesarean section, and prehydration fluid of less than 500 ml, baseline systolic blood pressure less than 120 mmHg, combination of spinal and general anesthesia, spinal puncture at or above the L2-L3 interspace, and addition of phenylephrine to the local anaesthetic.4,5

8. e. The incidence of hypotension and bradycardia may increase with increasing age and analgesic level > or = T4 dermatome5.

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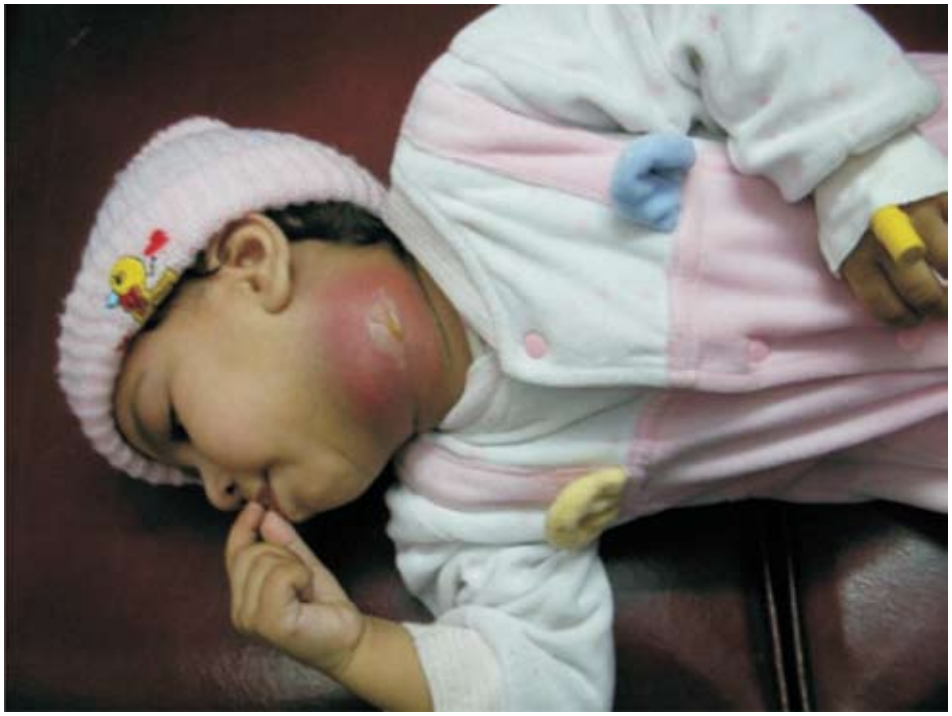
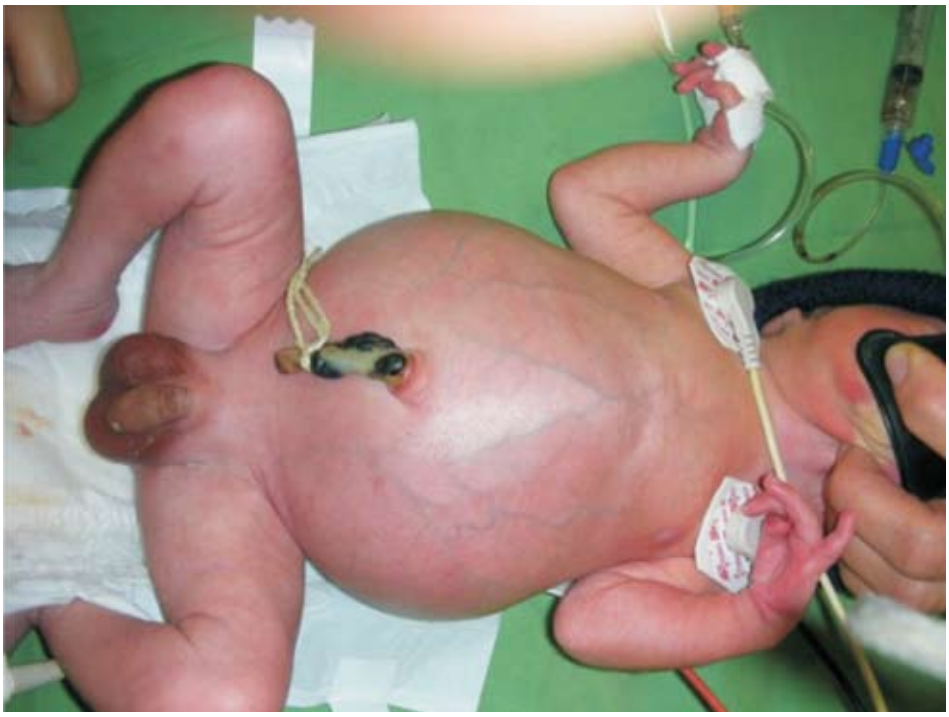
Photomania

This baby was misdiagnosed as suffering from mumps. It is not the location of parotid gland. Abscesses in the neck should never be left to wait for fluctuation. Because investing fascia of the neck prevents it to surface and much destruction and edema of tissue will occur in retropharyngeal spaces thus endangering breathing.





Gross abdominal distension in a neonate is an adverse factor during induction and maintenance of anesthesia. Expedient laparotomy to relieve the tenting effect of distended viscera will facilitate the anesthetist. Anesthetist and surgeon combined effort facilitate intra operative management of patients.

Photos and narration: Prof. Naeem Khan, Prof. & HOD, Dept of Pediatric Surgery, KRL General Hospital, Islamabad. (Pakistan).