VOLUME 24
NUMBER 1
JANUARY 2011

ISSN 2220-8992

Journal of the Bangladesh Society of Anaesthesiologists

JOURNAL OF THE BANGLADESH SOCIETY OF ANAESTHESIOLOGISTS

VOL 24, NO. 1, JANUARY 2011

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This journal is officially sponsored by S. T. MARKETING CORPORATION LTD. & CITY ELECTRO-MEDICS CO. as part of their continuing educational support.

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JOURNAL OF THE BANGLADESH SOCIETY OF ANAESTHESIOLOGISTS

VOLUME - 24 **NUMBER - 1** **JANUARY 2011**

CONTENTS

Ultrasound-guided regional anaesthesia: a new era in the field of anaesthesia

The use of ultrasound for regional anesthesia is relatively new, however interest in this application is growing rapidly. Ultrasound guided nerve blocks were first described as early as 1978, but it was not until the advent of advanced ultrasound technology in the 1990's that interest in this field grew. Published reports of ultrasound guided regional anesthesia have largely focused on brachial plexus blockade in the interscalene, supraclavicular, infraclavicular and axillary regions. Recent studies examining the efficacy of ultrasound guidance for femoral, sciatic, psoas compartment, coeliac plexus and stellate ganglion blocks are promising, while ultrasound visualization of the epidural space can facilitate neuraxial blockade in children, adults and parturients.

Regional anesthesia performed with ultrasound guidance has become standard practice and has been endorsed by the National Institute of Clinical Excellence (NICE) in the UK. It can provide direct, real-time images of peripheral nerves and identify tissue planes that help to place the local anesthetic accurately. Ultrasound machines have improved substantially with the availability of high-resolution portable machines. Some even consider that ultrasound may soon become a part of the standard anesthesia machine.[1] Do we know whether the use of ultrasound is safe and better than the other techniques for nerve block, and is there need for an evidence-base to show this, as some have voiced previously?[2] Meanwhile, others suggest that the introduction of ultrasound is a step forward that is not required.[3] To address this, there is now an attempt to establish a registry in one department in the USA (Hospital for Special Surgery, New York), which will document the efficacy and outcomes of ultrasound-guided regional anesthesia in order to build a database of evidence.[4] They enrolled 1169 patients undergoing ambulatory shoulder arthroscopy and recorded their pre and post-operative observations, including any post-operative neurological signs. The success rate of the interscalene and supraclavicular blocks was approximately 99.8%, and the rate of complications, including that of neurological symptoms, was low. What is required is more outcome studies, such as the one by Liu et al[4] and for various types of blocks, to build up an evidence-base of the safety of ultrasound use in regional anesthesia.

Conventional peripheral nerve block techniques that are performed without visual guidance are highly dependent on surface anatomical landmarks for localization of the target nerve. It is therefore not surprising that regional anesthetic techniques are associated with a reported failure rate of up to 20% presumably because of incorrect needle and/or local anesthetic placement. Multiple trial-and-error attempts to locate the target nerve can lead to operator frustration, unwarranted patient pain, and time delay in the operating room, especially in patients with difficult anatomical landmarks. Imaging technology such as MRI and CT scan can successfully localize neural structures. However, ultrasound is the most practical imaging tool for regional anesthesia as it is portable, relatively easy to learn, moderately priced, and does not pose any radiation risk. Ultrasound provides real time imaging guidance during a nerve block procedure.The following are the advantages of ultrasound[5]:1)Reveals the nerve location and the surrounding vascular, muscular, bony, and visceral structures.2) Provides real-time imaging guidance during needle advancement allowing for purposeful needle movement and proper adjustments in direction and depth.3) Images the local anesthetic spread pattern during injection.4) Improves the quality of sensory block, the onset time, and the success rate compared to nerve stimulator techniques (as shown in some clinical studies).4)Reduces the number of needle attempts for nerve localization which may prove to reduce the risk of nerve injury.5)Differentiates extravascular injection from unintentional intravascular injection.6)Differentiates extraneural injection from unintentional intraneural injection.

Undoubtedly, ultrasound has illuminated our knowledge of regional anesthesia and increased our understanding of block success and neurologic complications. Additional studies are required to identify its role in teaching and certification. However, even with ultrasound guidance, there will be vascular puncture and other needle-related trauma, intravascular and intraneuronal injections, and failed blocks. Ultrasound-guided regional anesthesia is not a metaphysical experience, it is physics expertly applied to the art of neural blockade. As the physics and our expertise improve, so may our outcomes.

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Consultant Cardiac Anaesthesia, Square Hospital, Dhaka

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Original Article

Addition of clonidine or fentanyl with bupivacaine for supraclavicular brachial plexus blocks in upper limb surgery- a randomized comparative study

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Abstract:

Background *The popularity of supraclavicular brachial plexus block in upper limb surgery in recent years are due to better understanding of using adjuvant to local anaesthetics, its advantages and in avoidance of the hazards of general anaesthesia.*

Objective *To compare the quality of anaesthesia and duration of analgesia with clonidine-bupivacaine or fentanyl-bupivacaine in supraclavicular brachial plexus block.*

Method *A total number of 60 patients (ASA class 1 and II) were selected randomly into two groups, thirty in each group. Group-A (control group) received fentanyl (100μg) 2ml and bupivacaine (0.25%) 38ml, total of 40ml.Group-B (study group) received clonidine (150μg) 2ml and bupivacaine (0.25%) 38ml, total of 40ml.The parameters including pulse rate, non-invasive systolic and diastolic blood pressure, respiratory rate, SpO_2, onset and duration of motor and sensory block, post operative pain score in VAS, duration of analgesia, first analgesic demand, side effects were assessed and recorded.*

Result *Onset and duration of sensory block were significantly higher in group-B than in group-A (P<0.001) and motor block were quite prolonged in group-B than group-A (p<0.001), prevalence of sedation in group-B slightly higher than group-A. But intensity of pain measured by VAS in group-A expressed highest at 8 hours of postoperative period and group-B shows highest VAS at 12 hours. Duration of effective analgesia (time from supraclavicular block to first analgesic demand) in study group-B had significantly longer mean duration than that produced by control group-A (14.4 ± 1.3 vs 10.9 ± 1.5 hours; P<0.001).*

Conclusion *Clonidine and bupivacaine combination is a better alternative to fentanyl and bupivacaine in respect of quality of anaesthesia and duration of analgesia.*

Keywords *Supraclavicular, clonidine, fentanyl, brachial plexus block, bupivacaine*

(JBSA 2011; 24(1): 3-7)

Introduction

Brachial plexus regional anesthesia has been a mainstay of the anesthesiologists armamentarium since Hall, first reported the use of cocaine directly to the upper limb nerves in 1884[1]. Regional nerve block avoids the unwanted effects of anaesthetic drugs used during general anaesthesia and the stress response of lanryngoscopy and tracheal intubation. Minimizing the stress response and using minimal anaesthetic drugs is always beneficial for the patients with various cardio-respiratory co-morbidities. The supraclavicular

approach to brachial plexus result in a more even distribution of local anaesthetics and can be used for procedures on arm, forearm and hand [2]. In this approach the plexus is blocked where it is most compactly arranged at the level of nerve trunks. As a result a block with rapid onset can be achieved, this approach also offers a high success rate for techniques to extend the duration of block. Clonidine appears to have significant analgesic benefit and to cause minimal adverse effects when added in a dose up to 150µg [7-8]. Fentanyl added to elbow, forearm and hand surgery because all the branches of brachial plexus can be reliably blocked[3]. Now-a -days different drugs have been used as an adjuvant with local anaesthetic in brachial plexus block to achieve quick, dense and prolonged block[4] .

Drugs like morphine, pethidine, fentanyl, clonidine, dexamethasone, midazolam are commonly used along with local anaesthetic for this purpose. However their use is limited because of side effects, like deep sedation respiratory depression and psychomotor effects. Drugs with minimal side effects are always looked for. Adding clonidine[5] or fentanyl[6] to bupivacaine produce analgesia, sedation with minimal side effects.Since 1980's clonidine has been used as an adjuvant to local anesthetic in various regional anaesthesia, bupivacaine prolongs anaesthesia and analgesia in axillary brachial plexus and supraclavicular block [9-10]. On the basis of studies of related literature and discussion made above, it may be thought that bupivacaine- clonidine is a better alternative to bupivacaine-fentanyl for supraclavicular brachial plexus block.

In this study we have evaluate the quality, onset, duration of anaesthesia and analgesic effects of clonidine in bupivacaine as compared to fentanyl in bupivacaine in supraclavicular block for upper limb surgery.

Methods

After approval by the hospital ethical committee this prospective randomized single-blind study involving 60 ASA I and II supraclavicular aged 18-60 years either sex undergoing bronchial plexus block for elective upper limb surgery.

This single blind, randomized prospective study of supraclavicular brachial block for upper limb surgery (elbow, forearm and hand) was carried out in Dhaka medical collage Hospital. Total numbers of patients were 60 and divided into two groups containing 30 in each. They were aged 18-60 years, ASA class 1&II. This prospective study was conducted after obtaining ethical clearance from ethical review committee (ERC). The written informed consent and assessment of all the selected patients were taken preoperatively.In Group-A, patients were received bupivacaine (0.25%) 38ml and fentanyl (100ìg) 2ml, total of 40ml. In group-B, patients were received bupivacaine (0.25%) 38ml and clonidine (150ìg) 2ml, total of 40ml for supraclavicular block. Patients refusal, coagulopathy or receiving anticoagulants therapy, history of allergy to study drugs, history of hypertension, peripheral neuropathy, inadequate block or any unsuitable local condition coere excluded from this study.

On arrival of patient at operating room base line pulse rate, blood pressure, respiratory rate and pain score were recorded. A peripheral IV line was established in the non-operated hand. Patients were hydrated with IV Hartman solution 500ml at rate of 30drops/min with all aseptic precaution, supraclavicular brachial plexus block were established using of paresthesia technique in the proposed operated hand. Patients were on supine position, head turned to the opposite side and arm placed medially towards the body, 2ml of 1% lignocaine was used for infiltration at mid-clavicular line half inch above the clavicle. Using stylets of 22G IV cannula, drugs were deposited with three plane aspiration techniques. The time of onset of block were noted. The onset of sensory block was assessed with application of cold spirit swab and response to pin prick by blank needle in different areas innervated by radial, ulnar, median, musculocutaneous nerves at 5min interval. The time of onset of complete sensory block was noted. The motor block was assessed every 5min by asking the patients to raise their ipsilateral hand and move their fingers. When patients could not move fingers or raise hand, it was considered as complete motor block (modified bromage scale), the time was noted. The duration of analgesia was noted according to 0-10 visual analog scale (VAS) for pain at every hour till 10 hrs then to 2 hrs for 24 hrs. Frequency of sedation, hypotension, nausea, and convulsion were recorded. All data were recorded on data sheet, after collection, data were checked meticulously and then compiled, analyzed for statistical significance using mean standard deviation, independent student 't'test, ANOVA, chi-

squared test or Fisher's exact test as appropriate using SPSS version 12.0 for windows. A p-value <0.05 was regarded as significant.

Results

Table I *Demographic characteristics of Group-A and Group-B*

Demographic variables	Group A (n=30)	Group B (n=30)	P value
Age (years)			
> 30	11 (36.7)	18 (60.0)	
< 30	19 (63.3)	14 (40.0)	
Mean±SD	33.1±13.2	29.5±11.2	0.256
Sex			
Male	23(76.6)	21(70.0)	0.559
Female	7(32.3)	9(30.0)	
Weignt (kg)	56.2±10.2	59.3±6.1	0.160

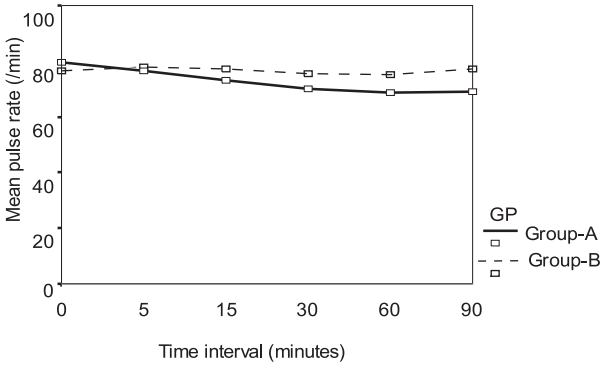

Fig 1 *Monitoring of pulse rate at different time interval.*

There was no significant differences between groups in respect of changes of pulse rate.

Table II *Comparison of timing of anesthesia events between Group-A and Group-B*

Timing of anesthesia	Group-A (n=30)	Group B (n=30)	P-value
Onset of sensory block (minutes)*	8.9 ± 2.9	11.9 ± 2.7	<0.001[s]
Duration of sensory block (minutes)*	364.5 ± 33.3	558.0 ± 66.4	<0.001
Onset of Motor block (minutes)*	8.3 ± 2.7	9.8 ±2.1	0.026[s]
Duration of Motor block	388.2 ± 34.8	574.3 ± 40.9	<0.001[s]

*Data were analysed using Student's t-Test and were presented as mean ± SD onset and duration sensory block were significantly higher in Group B than Group-A. Onset and persistence of motor block were significantly higher in Group B than Group-A.

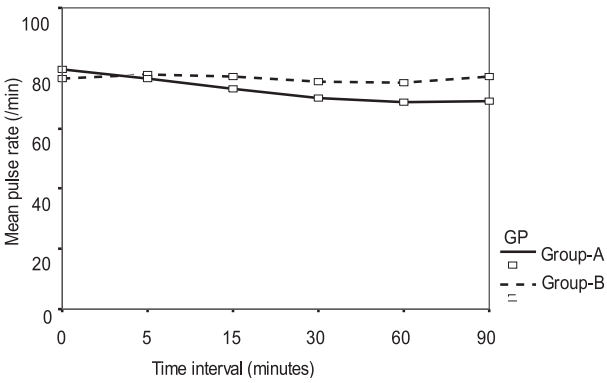

Fig 2 *Monitoring of systolic blood pressure at different time interval*

Table III *Comparison of quality of anesthesia between Group-A and Group-B*

Quality anesthesia	Group-A (n=30)	Group-B (n=30)	p-value
Quality of sensory block[#]			
Partial	00	1(3.3)	
Complete	30(100.0)	29(96.7)	0.500
Quality of motor block[#]			
Partial	0(0.0)	5(16.7)	0.026[s]
Complete	30(100.0)	25(83.3)	

Fisher's Exact Test was employed to analyze the data; S = Significant. Complete motor block was significantly less in Group-B (83.3%) than that in Group-A (100%) (p=0.026)

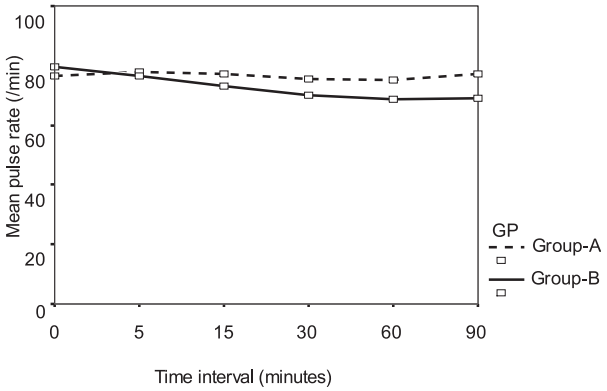

Fig 3 *Monitoring of SPO2 at different time intervals.*

Table IV *Comparison of post-operative pain VAS between Group-A and Group-B*

Pain VAS(cm)	Group-A (n=30)	Group-B (n=30)	p-value
Pain VAS at 0.5 hr	00	00	
Pain VAS at 1hr	0.3±0.2	00	
Pain VAS at 2hr	0.8± 0.4	00	
Pain VAS at 41hr	2.9±2.7	00	
Pain VAS at 6hr	4.4 ±2.7	00	
Pain VAS at 8hr	7.7±2.2	3.6±1.8	<0.001[s]
Pain VAS at 10hr	2.5±1.9	4.9±1.9	
Pain VAS at 12hr	1.2±1.1	7.5±2.3	
Pain VAS at 14hr	1.1±0.9	2.4±1.7	
Pain VAS at 16hr	0.9±0.7	0.9±0.8	

Repeated measure ANOVA statistics was employed to analyze the data 'P' refers to overall differences between groups. S=significant Intensity of post operative pain measured on VAS showed Group-A expressed highest VAS at 8 hrs of post operative. Period and Group-B Showed highest VAS at 12 hrs.

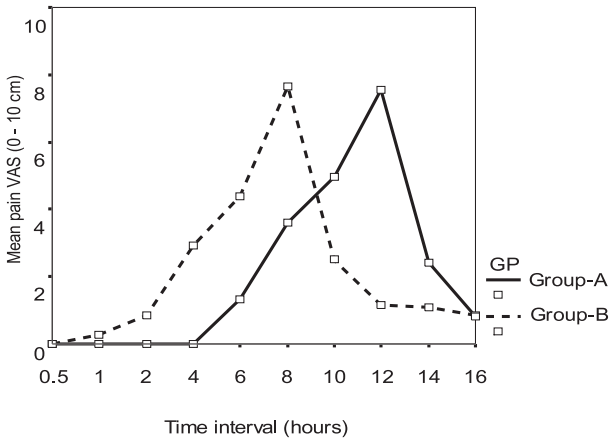

Fig 4 *Monitoring of postoperative pain VAS at different time interval.*

Table V *Comparison of effective analgesia between groups*

Group	Duration effective analgesia (hours)		P-value
	Mean	SD	
Group-A	10.9±1.5	1.5	<0.001[s]
Group-B	14.4±1.3	1.3	

Data were analysed using Unpaired t-Test and are presented as mean ± SD; S=Significant, duration of effective analgesia (time from supraclavicular block to first analgesic demand) Study group-B had significantly longer mean duration of analgesia (14.4+1.3hrs.) than that produced by control group-A (10.9+1.5hrs) (p<0.001).

Table VI *Comparison of analgesic demand between groups*

1st dose analgesic	Group-A (n=30)	Group-B (n=30)	p-value
No	26(86.7)	30(100.0)	0.056[NS]

Fisher's Exact Test was done to analyze the data; NS=Not significant

Discussion

Adjuvant improves analgesia, reduces systemic side effects and total dose of local anesthetics. Opioids like fentanyl, morphine, pethidine, non-opioid like dexamethasone, midazolam, and neostigmine have been studied as adjuvant to local anaesthetics[7]. However, there use is limited because of side effects like sedation, hypotension, purities[7], and sympatho-mimetic effects[6]. Fentanyl-bupivacaine combination used in spinal, epidural and in brachial plexus block. Their use has established because onset is rapid, anaesthesia more complete and prolonged analgesia[10]. Clonidine, a newer drug with selective agonist activity at alpha$_2$ adenoreceptor receptors have been used for many years as a centrally acting antihypertensive agent. Clonidine is second useful adjuvant after epinephrine for brachial plexus blockade.

Addition of clonidine with bupivacaine in the branial plexus block prolongs anaesthesia, analgesia and reduces side effects [12] . In this study fentanyl or clonidine was used as adjuvant in bupivacaine. Onset as well as duration of sensory and motor block were recorded along with quality. In Group-B (Clonidine-bupivacaine) the onset and duration of sensory and motor block block were significantly higher than that of Group-A In our study, intra and postoperative mean pulse rate, systolic, diastolic BP, respiratory rate and SPO_2 did not vary through out whole period of observation. There was no significant difference between two groups. The intensity of postoperative pain measured on VAS (visual analog scale) show that the subjects of Group-B had no pain from 0.5 hr to 4 hrs period. Then after it began to rise and reaches its peak at 12 hrs, when an analgesic dose was needed to reduce the intensity of pain. No pain was observed in Group-A at 0.5 hrs, thereafter it increased insidiously 2.9 cm at 4 hrs interval, 7.7cm at 8 hrs interval which then sharply decreased 2.5cm and 1.25cm at 10 hrs, 12 hrs interval

respectively following an analgesic dose. Regarding duration of analgesia, in our study it was demonstrated that mean duration of analgesia was significantly longer in Group-B (14.4± 1.3 hrs) than that produced by Group-A (10.9±1.5 hrs) (P<0.001) which was significant. Eledjam et al (1991) done a study to compare the quality and duration of analgesia in two groups, group-1 (received clonidine 150ìg in bupivacaine 0.25% 40ml) and group2 (received 200ìg epinephrine in bupivacaine 0.25% 40ml). Analgesia was prolonged with clonidine, 994.2± 34.2 min VS 728.3±35.8min) and superior to that of epinephrine (P<0.001)[13]. Duration of analgesia interms of hrs, was nearly matched with our study. EI Saied et al(2000) showed that addition of 150ìg clonidine to 40ml ropivacaine 0.75% for axillary plexus block resulted in increase in duration of both anaesthesia and analgesia which support our study because pharmacokinetic character of ropivacaine and bupivacaine are similar[14]. Regarding duration of analgesia between groups four (13.3%) of 30 patients in Group-A required first analgesic dose within 8 hrs period after operation while none of the patients in Group-B required analgesic within the same period (P=0.06) which was not significant. In our study 3 (10%) subjects in group-B had deep sedation which was not observed in group-A at all (P=0.837).

In a study by Shah Alam et al in 2008 showed that prevalence of sedation was higher in clonidine-bupivacaine group (40%) than fentanyl-bupivacaine group (33%) and they did not found any significanct change. The result of that study is matched with this study. From the discussion so far, it is evident that clonidine-bupivacaine combination is more effective than fentanyl-bupivacaine in reducing intensity of postoperative pain.

So concluded that clonidine and bupivacaine for supraclavicular brachial plexus block markedly improve intra-operative quality of anaesthesia, increased duration of postoperative analgesia and reduce incidences of side effects.

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Original Article

The effect of low dose midazolam in addition to ondansetron on post-operative nausea and vomiting in laparoscopic cholecystectomy – a comparative study.

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Abstract

Background *Nausea, retching and vomiting are among the most common postoperative complaints. Premedication with low dose midazolam in addition to ondansetron is more effective in controlling postoperative nausea and vomiting.*

Objectives *This study was designed to observe the effect of low dose midazolam 7.5mg in addition to ondansetron 4mg on postoperative nausea and vomiting in laparoscopic cholecystectomy.*

Methods *100 patients of ASA grade I and II, age range 30-50 years and weight 50-70 kg were randomly selected by a blind envelop method. They were equally divided into four groups of 25 patients in group each. Group I received vitamin, Group II ondansetron 8mg, Group III ondansetron 8mg and midazolam 7.5mg and Group IV ondansetron 4mg and midazolam 7.5 mg orally one hour before operation. In the recovery room occurrence of nausea and vomiting was assessed for 24 hours.*

Results *The incidence of nausea was in vitamin Group I 64%, in ond_8 group II 32%, in ond_8+$mid_{7.5}$ group III 24% and in ond_4+$mid_{7.5}$ group IV 24%. The incidence among the groups was highly significant (p=0.008). The incidence of vomiting was in vitamin Group I 16%, in ond_8 group II 16%, in ond_8+$mid_{7.5}$ group III 8% and in ond_4+$mid_{7.5}$ group IV 8%. The difference among the groups were not significant (p=0.808).*

Conclusion *Low dose midazolam 7.5mg in addition to ondansetron 4mg is more effective in controlling postoperative nausea and vomiting in laparoscopic cholecystectomy.*

Key words *Laparoscopic cholecystectomy, PONV, oral ondansetron, midazolam and vitamin.*

(JBSA 2011; 24(1): 8-12)

Introduction

Nausea, retching and vomiting are among the most common postoperative complaints and can occur after general, regional or local anaesthesia[1]. The aetiology of PONV is multifactorial and includes factors related to the characteristics of the patients, the type of surgery, type of anaesthetics and postoperative conditions [2].

Persistent nausea and vomiting may result in dehydration, electrolyte imbalance and delayed discharge. It may also cause tension on suture lines, venous hypertension and increase bleeding under skin flaps and can expose the subject to an increased risk of pulmonary aspiration of vomitus if airway reflexes are depressed form the residual effects of anaesthetic and analgesic drugs [3] .

Laparoscopic cholecystectomy is associated with a high incidence of (65%) postoperative nausea and vomiting. Antiemetic prophylaxis may be justified in patients who are at greater risk of developing postoperative nausea and vomiting [2].

The mechanism of PONV is a complex process that is still not completely understood. It is unlikely that a single drug will ever be totally effective against postoperative nausea and vomiting. The aim in PONV should therefore be to individualize a combination of antiemetics to suit a particular patients. Ondansetron a selective serotonin subtype 3 (5-HT_3) antagonist is the new class of antiemetic drug recently introduced into practice. As post operative emesis is a difficult

multifactorial problem it is best to treat with combination of drugs working via different receptors [6,7] . Low dose midazolam is one of the drugs that can form part of the combination (with ondansetron) requiring for difficult patients.

The mechanism of action of the antiemetic effect of midazolam is not well understood. It has been postulated that midazolam causes a reduction in anxiety and decrease in dopaminergic input to the chemoreceptor trigger zone (CRTZ) . Midazolam may reduce the reuptake of adenosine. This leads to an adenosine mediated reduction in synthesis, release and postsynaptic action of dopamine at the CRTZ[7]. It may be that Benzodiazepines reduce dopaminergic neuronal activity by binding to the $GABA_A$ benzodiazepine receptor complex . Midazolam may also reduce 5-HT release by binding to the $GABA_A$ benzodiazepine receptor complex [6].

Methods

This randomized prospective clinical study was carried out in the Department of Anaesthesia, Analgesia and Intensive Care Medicine, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka. The approval of the University Ethical Committee was duly taken before carrying out the study informed consent was taken.

Patients aged between 30 -50 years and weight between 50-70 kg weight of both sexes ASA Class I and II scheduled for laparoscopic cholecystectomy. Patients with persisting vomiting during the last 24 hours before surgery, antiemetics during the last 24 hours before surgery, expected to have a nasogastric tube after surgery, uncontrolled clinically important neurological, renal, hepatic, cardiovascular, metabolic or endocrine dysfunction, were excluded from this study.

After recruitment 100 patients were randomly divided into four equal groups of 25 patients each. Patients in group I received Vitamin, in Group II ondansetron 8 mg, in group III ondansetron 8 mg and midazolam 7.5 mg, in group IV ondansetron 4 mg and midazolam 7.5 mg 1 hour before surgery. On arrival of the patients in the operation theatre intravenous line was inserted Before intravenous induction by thiopental sodium 3-5 mg/kg body weight all patients were pre-oxygenated with 100% oxygen for 2 minutes after receiving a pre-induction dose of fentanyl 1 μgm/kg body weight. Endotracheal intubation was facilitated by succinylcoline 1.5 mg/kg body weight. Before endotracheal intubations nasogastric suction tube was introduced. Vecuronium 0.1 mg/kg b.w. was given for muscle relaxation and anaesthesia was maintained with 40% oxygen, nitrous oxide 60% and halothane 0.5-1% and incremental dose of fentanyl (0.3-0.4 mmg/kg body weight) was given if necessary. Intraoperative proper hydration was maintained with normal saline or Hartman's solution. Tracheal extubation was performed after reversal of neuromuscular blocking agent by neostigmine 0.04-0.05 mg/kg b.w. and atropine 0.02 mg/kg b.w. Before extubation nasogastric suction tube was removed. In the recovery room pethidine at a dose of 1mg/kg b.w. was given intramuscularly in each patient 12 hourly and on demand for analgesia and sedation. The 24 hours study period started upon entry to the recovery room. The haemodynamic parameters were measured preoperatively, then 5 minutes, 30 minutes, 1 hour and 2 hours after induction and during recovery. Postoperatively those were observed at 30 minutes, 1 hour, 2 hours, 4 hours, 8 hours, 16 hours and 24 hours.

The number and time of emetic episodes and antiemetic treatments were recorded. Injection ondansetron 4mg was used once as the rescue antiemetic. The result was compiled and analyzed statistically using chi-square test and ANOVA test. Results were considered significant if 'p' value is less than 0.05. (CI – 95%)

Results

Table I *The age, body weight, sex and ASA grading are presented.*

		Groups				p
		Vit	Ond_8	$Ond_8 + Mid_{7.5}$	$Ond_4 + Mid_{7.5}$	
Age (Years)		44.04±16.12	39.16±14.61	37.04±9.85	45.2±14.53	0.129
Body weight (Kg)		58.16±8.9	51.32±9.54	59.52±7.37	56.32±10.16	0.011
Sex	Male	5 (20%)	4 (16%)	4 (16%)	8 (32%)	0.459
	Female	20 (80%)	21 (84%)	21 (84%)	17 (68%)	
ASA	ASA 1	23 (92%)	22 (88%)	21 (84%)	16 (64%)	0.049
	ASA 2	2 (8%)	3 (12%)	4 (16%)	9 (36%)	

Values are expressed as Mean±SD or in frequencies. Within parenthesis are percentage over column total. Values are regarded as significant if $p<0.05$.

Table II *The incidence of nausea in four groups are shown in number and percentage.*

Groups (n=25)	Nausea	
	N	(%)
Vit	16	(64%)
Ond_8	8	(32%)
Ond_8+$Mida_{7.5}$	6	(24%)
Ond_4+$Mida_{7.5}$	6	(24%)
Chi-Square		11.8
P value		0.008

Values are presented as frequency. Within parenthesis are percentages over column total. Analysis was done by chi-square test. Values are regarded as significant if $p<0.05$.

Table III *The incidence of vomiting in four groups are shown in number and percentage.*

Group	Vomiting	
	N	(%)
Vit	4	(16%)
Ond_8	4	(16%)
Ond_8+$Mida_{7.5}$	2	(8%)
Ond_4+$Mida_{7.5}$	2	(8%)
Chi-Square		.97
P value		0.808

Values are presented as frequency. Within parenthesis are percentages over column total. Analysis was done by chi-square test. Values are regarded as significant if $p<0.05$.

Table IV *The incidence of rescue antiemitic in four groups are shown in number and percentage*

Group (n=25)	N	(%)
Vitamin	4	(16%)
Ondansetron (8mg)	3	(12%)
Ondansetron (8mg) + Midazolam (7.5mg)	2	(8%)
Ondansetron (4mg) + Midazolam (7.5mg)	2	(8%)
χ^2 value		0.758
p value		0.86

Values are presented as frequency. Within parenthesis are percentages over column total. Analysis was done by chi-square test. Values are regarded as significant if $p<0.05$.

Table V *The scoring of sedation in four groups are shown in number and percentage.*

Group	Sedation score after recovery																				
	at 30 min at			60 min			at 2 hr			at 4 hr			at 8 hr			at 16 hr			at 24 hr		
	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2	0	1	2
		24	1	9	15	1	-	12	13	-	2	23	1	6	18	-	-	25	25	-	-
Vit	0	(96%)	(4%)	(36%)	(60%)	(4%)		(48%)	(52%)		(8%)	(92%)	(4%)	(24%)	(72%)			(100%)	(100%)		
		24	1	4	19	2	1	4	20	1	2	22	7	17	1	-	1	24	22	3	-
Ond_8	0	(96%)	(4%)	(16%)	(76%)	(8%)	(4%)	(16%)	(80%)	(4%)	(8%)	(88%)	(28%)	(68%)	(4%)		(4%)	(96%)	(88%)	(12%)	
Ond_8+	0	17	8	11	14	-	-	8	17	-	3	22	3	20	2	-	4	21	24	1	-
$Mid_{7.5}$		(68%)	(32%)	(44%)	(56%)			(32%)	(68%)		(12%)	(88%)	(12%)	(80%)	(8%)		(16%)	(84%)	(96%)	(4%)	
Ond_4+	0	21	4	8	17	-	1	10	14	1	4	20	1	11	13	1	9	15	23	2	-
$Mid_{7.5}$		(84%)	(16%)	(32%)	(68%)		(4%)	(40%)	(56%)	(4%)	(16%)	(80%)	(4%)	(44%)	(52%)	(4%)	(36%)	(60%)	(92%)	(8%)	
χ^2 value			10.963			7.824			7.993			3.218			41.255			7.556		3.546	
p value			0.012			0.251			0.239			0.781			0.001			0.056		0.315	

0 = Full awake, 1 = Drowsy, 2 = Asleep, rousable
Values are presented as frequency. Within parenthesis are percentages over column total. Analysis was done by chi-square test. Values are regarded as significant if $p<0.05$.

Discussion

Nausea, retching and vomiting are among the most common postoperative complaints. Factors associated with an increased risk of postoperative emesis include age, gender, obesity, previous history of motion sickness or postoperative vomiting, anxiety, gastroparesis, pain, hypoxia, type of anaesthetic, hypotension, and type and duration of the surgical procedure. Patients undergoing laparoscopic surgery are at high risk for postoperative nausea and vomiting.

Di Florio and Goucke studied the effect of low dose midazolam on postoperative nausea and vomiting [8]. They used injection midazolam 1mg/70kg/hr intravenous infusion in normal saline at the concentration of 10mg/100ml (.1mg/ml) on those patient where PONV were not controlled even after giving the metoclopramide 10mg as pretrial and prochlorperazine 12.5mg and droperidol 1.25mg as antiemetic intravenously. There was no clinically significant difference in sedation score or change in SpO_2 in either the saline or midazolam groups, however one patient in each group became confused and disoriented and their infusion were ceased early. Patients in the midazolam group had significantly smaller cumulative nausea scores (p=0.04) and number of vomits (p=0.02). Rescue antiemetics were only required in the placebo group (p=0.003). They concluded that low dose midazolam infusion would be safe and effective in the treatment of resistance PONV.

In our study the incidence of nausea was 64% in group I, 32% in group II, 24% in group III and 24% in group IV. And the incidence of vomiting was 16% in group I, 16% in group II, 8% in group III and 8% in group IV.

In comparison to their study we found that, the incidence of nausea and vomiting were equal in group III and group IV. Rescue antiemetics ondansetron 4mg intravenously were used as a single bolus dose in group I 16%, group II 12%, group III 8% and group IV 8%. Here it was also seen that the use of rescue antiemetics were equal in group IV compare to group III. Requirement of antiemetic intravenously could be cause of oral form in our study compare to the continuous infusion in Di Florio and Goucke's study.

In the present study, the difference of sedation scores of the patients in four groups at different time intervals were not significant except at 30 minutes (p=0.012) and 8 hours after recovery. Probably it was due to the early and late analgesic and sedative properties of pethidine.

To maintain the postoperative analgesia pethidine 1 mg/kg body wt. was given intramuscularly 12 hourly and on demand. In the present study, it was a great satisfaction that though injection pethidine was given to all patients of four study groups for post operative analgesia and sedation, there were no increase in frequency of nausea and vomiting episodes as its side effects, which were also probably blocked by the combination of ondansetron and midazolam.

In comparison to Di. Florio and Goucke[8], in the present study, there was no confusion and disorientation of any patient among the four study groups as happened in one patient of each group of them. Probably it was due to oral form rather than the continuous infusion.

So study concluded that Oral premedication with midazolam 7.5mg in addition to ondansetron 4mg is more effective as compare to ondansetron alone in controlling postoperative nausea and vomiting in laparoscopic cholecystectomy.

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Original Article

Induction characteristic of general anaesthesia in children- a comparative study between sevoflurane and halothane

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Abstract

Background *Inhalational induction of anaesthesia remains of fundamental technique in paediatric anaesthesia. Halothane used most frequently for inhalational induction in children. Halothane is not an ideal induction agent because of its potential to cause bradycardia, hypotension and ventricular ectopy. The pleasant nonpungent order of sevoflurane, faster induction of anaesthesia and stable vital signs during induction suggest that it may be a suitable alternative to halothane for use in paediatric anaesthesia.*

Objectives *The aim of study is to compare the induction time and haemodynamic response during induction of sevoflurane and halothane.*

Methods *A total number of 60 patients, age within 1-12 years (ASA grade I & II) were selected randomly into two groups, thirty in each group. Group A induction was done by halothane and Group B induction was done by sevoflurane. Anaesthesia was induced with 60% N_2O and 40% O_2 and starting inspired concentration of halothane was 1% or sevoflurane was 2% followed by stepwise increases in the inspired concentrations of either sevoflurane (1.5-2% increments) or halothane (0.5-1% increments) every three to four breath until the patients no longer blinked in response to touching the eye lashes. Arterial pressure, heart rate, oxygen saturation (S_PO_2) were recorded every minute for 3 minutes during induction and induction time was recorded.*

Results *Induction time was significantly shorter in the sevoflurane group compared to the halothane group ($P < 0.001$). In haemodynamic profile heart rate and mean arterial pressure were significantly reduced in halothane group while no significant changes were observed in sevoflurane group during induction period ($P < 0.001$).*

Conclusion *The study concludes that induction of anaesthesia was faster with sevoflurane than halothane. Vital signs were stable with sevoflurane during induction period.*

Key words *Paediatric anaesthesia, inhalational induction, sevoflurane, halothane.*

(JBSA 2011; 24(1): 13-17)

Introduction

The primary objective of anaesthesia is to facilitate surgery at minimal risk to the patient and to ensure smooth induction and optimal recovery following the procedure.

Researchers are continuously looking for safety in anaesthesia by improving the quality of drugs, instruments and different procedures to provide a smooth induction from anaesthesia and better operative condition.

In western countries, it is customary to use of one of the five modern volatile anaesthetic agents like Desflurane, Sevoflurane, Enflurane, Isoflurane, Halothane vaporized in a mixture of nitrous oxide in oxygen[2]. In recent years, the use of halothane has declined because of medicolegal pressure

relating to hapatotoxicity and there has been a clear trend to avoidance of repeated halothane anaesthesia. Desflurane produces rapid recovery from anaesthesia but it is very irritants to the airway and is therefore not used as an inhalational induction agent of choice.[3] Isoflurane has pungent odour which makes inhalational induction relatively unpleasant particularly in children. Inhalational anaesthetics are particularly useful in the induction of paediatric patients in whom it may be difficult to start an intravenous line.

In contrast, adults usually prefer rapid induction with intravenous agents, although the non-pungency and rapid onset of sevoflurane have made inhalation induction practical for adults[5]. Three factors affect anaesthetic up take: Solubility in the blood, alveolar blood flow and the difference in partial pressure between alveolar gas and venous blood. The greater the uptake of anaesthetic agents, the greater the difference between inspired and alveolar concentrations and slower the rate of induction. Halothane, Isoflurane and Sevoflurane are used in Bangladesh. Isoflurane and sevoflurane is costly drugs and in terms of cost benefit ratio, use of halothane technique is cheaper. Cost of Sevoflurane can be reduced by induction with Sevoflurane and maintenance with Halothane.

Most children arrive in the operating room without an intravenous line in place and dread the prospect of being stuch with a needle. In the unpremedicated subject, halothane anaesthesia is associated with an increase in ventilatory rate and reduction in tidal volume. $PaCo_2$ increases as the depth of halothane anaesthesia increases.

Arrhythmia are very common during halothane anaesthesia and increased myocardial excitability augmented by increased circulating catecholamines. Bradycardia caused by central vagal stimulation[3].

Some clinicians use a single breath induction technique with sevoflurane (7-8% Sevoflurane in 60% nitrous oxide) to speed up induction[4]. Cardiovascular depression, bradycardia, and arrhythmia are significantly less with sevoflurane than with halothane. Sevoflurane is associated with the least respiratory depression. There are no reported instances of renal toxicity from inorganic fluoride production during Sevoflurane anaesthesia in children. Overall sevoflurane appears to have a greater therapeutic index than halothane and has become a preferred induction agent in paediatric anaesthesia[4].

Sevoflurane has many of the features of an ideal volatile anaesthetic agent. It is non irritant and has a low blood gas solubility means that induction of anaesthesia can be achieved rapidly by inhalation which makes it particularly useful in children where it now competes with halothane. It is also suitable for vital capacity induction by inhalation of a single large breath of a high concentration e.g. 8 percent in O_2. It is beginning to replace halothane as an induction agent of choice in patients with upper airway obstruction[5]. In this study, we have observed the effects of induction characteristics of halothane and sevoflurane in paediatric patient.

Methods

With approval from departmental ethical committee, written informed consent was obtained from the parents of 60 ASA physical status 1 and 2 children age 1-12 years who was scheduled for out patient day care surgery of genitourinary, lower abdominal and plastic surgery. The children was randomly assigned to received either halothane or sevoflurane. Demographic data including age, weight and type of surgery was recorded for all subjects. Vital signs including heart rate, MAP, respiratory rate and temperature were recorded one minute before induction of anaesthesia (baseline). All children were remains fasted and unpremedicated. After application of standard monitors including pulse oximeter and non invasive blood pressure, anaesthesia was induced with 60% N_2O and 40% O_2 and starting inspired concentration of halothane was 1% or sevoflurane was 2% followed by stepwise increases in the inspired concentrations of either sevoflurane (1.5-2% increments) or halothane (0.5-1% increments) every three to four breath. The vaporizer concentration was increased by an amount equal to the starting concentration of the drug until the patients no longer blinked in response to touching the eye lashes termed as induction time.

Following loss of the eye lash reflex. The vaporizer concentration was decreased to 5% Sevoflurane or 1.6% halothane (approximately 2

MAC). Anaesthetic gas concentration was maintained at 1 MAC throughout surgery until skin closure. Anaesthesia was delivered via face mask through Bain circuit or Ayre's t piece. During induction fresh gas flows were adjusted to 3-6 $L.min^{-1}$ for children aged 1-7 years and 6-10L/min for those aged 8-12 year. Arterial pressure, heart rate, oxygen saturation (SPO_2) were recorded every minute for 3 minute during induction. Immediately after induction of anaesthesia intravenous cannulation was established. Dextrose 5% + NaCl 0.225% solution was administered during anaesthesia at a maintenance rate appropriate for the child's age and fasting internal.

Anticholinergic medication was administered only for the treatment of bradycardia. Tracheal intubation was facilitated with succinylcholine 1-2 mg/kg I.V. All patients received fentanyl 1µg/kg intravenously immediately following induction. Neuromascular block was maintained by atracurium 0.5mg/kg I.V. N_2O and inhalation agent were continued until the surgical procedure was completed. At the time of placement of the last suture all anaesthetic agents were discontinued and 100% O_2 was administered for 1-2 minutes. Neostigmine 50ìg/kg with atropine 20ìg/kg I.V. were administered to antagonize residual neuromascular blockade.

Tracheal extubation was performed when the patient was judged to be awake (making purposeful movements), breathing regularly and demonstrating adequate muscle strength. For statistical analysis, induction time and induction vital signs were compared. Induction characteristics including coughing, laryngospasm, breath holding, nausea and vomiting, secretions, bronchospasm, excitement and any other unanticipated events was recorded.

Data was collected in a specially designed data sheet. It was compiled and analyzed for statistical significant by student's 't' test where appropriate using SPSS Window 11.6 software. Data was presented as mean ± SD or in frequencies as applicable. A 'p' value of less than 0.05 was considered statistically significant (CL-95%).

Results

This study groups became statistically matched for age in years (halothane 6.50±0.53; sevoflurane 6.20±0.57, p=0.701). Weight in kg (halothane 18.93±1.27; sevoflurane 18.12±1.13, p = 0.633), as shown in Table-I

Table I *Age and weight distribution of the study subjects*

Variable	Halothane	Sevoflurane	P value
No of patients	30	30	
Age (years)	6.50±0.53	6.201±0.57	0.701
Weight (kg)	18.93±1.27	18.12±1.13	0.633

Values are expressed as mean ± SD; analysis was done by unpaired student's 't' test.

Induction of anaesthesia was more rapid with sevoflurane than with halothane measured from the start of the inhalation agent and face mask.

Induction time was significantly shorter in the sevoflurane group compared to the halothane group (Table-II).

Table II *Induction time of the study subjects.*

Time	Halothane	Sevoflurane	P value
Time to loss of eyelash reflex (induction time in sec)	110.67± 3.42	43.33± 1.40	0.001

Values are expressed as mean ± SD; analysis was done by unpaired student's 't' test.

In haemodynamic profile, heart rate was significantly reduced in halothane group while no significant changes were observed in sevoflurane group during induction period (Table-III).

Table III *Changes of heart rate from baseline, during induction of anaesthesia.*

Heart rate	Halothane	Sevoflurane	P value
Baseline	93.10±1.59	96.43±1.86	0.178
During induction 1min	91.03±1.58	96.43±1.86	0.031
During induction 2min	88.33±1.57	95.33±1.76	0.004
During induction 3min	85.57±1.55	96.00±1.87	0.001

Values are expressed as mean ± SD; analysis was done by unpaired student's 't' test.

Mean arterial pressure was significantly reduced in halothane group while no significant changes was observed in sevoflurane group during induction period (Table-IV).

Table IV *Changes of mean arterial pressure from baseline, during induction of anaesthesia.*

Mean arterial pressure	Halothane	Savoflurane	P value
Baseline	76.50±0.60	77.77±0.33	0.070
During induction 1min	74.04±0.49	78.10±0.25	0.001
During induction 2min	71.70±0.44	76.83±0.31	0.001
During induction 3min	68.64±0.49	76.83±0.32	0.001

Values are expressed as mean ± SD; analysis was done by unpaired student's 't' test.

Anaesthesia related complications during induction shown in table-V.

Table-V: *Anaesthesia related complications during induction.*

Induction	Halothane		Sevoflurane	
	No.	%	No.	%
Coughing	6	(20%)	2	(6%)
Breath holding	8	(26%)	3	(10%)
Excitement	2	(6%)	8	(26%)
Vomiting	1	(3%)	0	
Bradycardia	7	(23%)	0	

Values are expressed as frequencies; within parenthesis are percentages over column total.

Estimated cost of Halothane and Sevoflurane group is displayed in Table-VI in Bangladeshi currency. Induction cost was significantly lower in halothane than sevoflurane.

TableVI *Induction cost of halothane vs sevoflurane.*

Variable	Halothane	Sevoflurane	P-value
Induction cost	11±0.34	52±1.68	0.001

Values are expressed as mean ±SD; analysis was done by unpaired students 't' test.

Discussion

Inhalational induction of anaesthesia remains of fundamental technique in paediatric anaesthesia.[6] Halothane remains the anaesthetic used most frequently for inhalational induction in children because it produces less airway irritation than enflurane[7], isoflurane[8] or desflurane. Despite its efficacy and frequency of use, however halothane is not an ideal induction agent because of its potential to cause bradycardia, hypotension and ventricular ectopy[9]. The pleasant non pungent odour of sevoflurane and its low blood gas partition coefficient suggest that it may be a suitable alterative to halothane for use in paediatric anaesthesia[10].

The blood gas partition coefficient predicts that induction should be more rapid with sevoflurane than with halothane[10]. In our study sevoflurane causes loss of eyelash reflex more quickly than halothane by 67.34 sec (p=0.001). This result is similar to that of a study by Veronique Piat et al. (1994)[11] who found that sevoflurane achieves induction faster than halothane by 30 sec. Another study by A Black et al. (1996)[6] found similar result of induction time approximately 40 sec. faster by sevoflurane than halothane. Haga et al.[12] induced anaesthesia in 180 children using a constant inspired concentration of either 4% or 6.4% Sevoflurane. These investigators measures induction times of 56 seconds and 47 seconds respectively. Our result of sevoflurane induction time was 43.33±1.40sec; (P=0.001). Study of Richard et al. (1995)[13] found induction was faster with sevoflurane (97±31 sec.) than halothane (120±36 sec, p<0.06). In our study result induction of sevoflurane was 43.33±1.40sec vs halothane 110.67±3.42sec, is similar with the study of Richard et al. (1995)[13] and during induction they given 7% sevoflurane and 5% halothane. In our study during induction we have used 7% sevoflurane and 4.5% halothane.

In our study children receiving halothane (80.20±1.70, beats/min) tended to have a decrease in heart rate during the anaesthetic induction period where as children receiving sevoflurane (96.43±1.79, beats/min) maintained or increased heart rate. This result is similar with the study of Joel B. Sarner et al. (1995)[10], they found heart rate of halothane was 89±18 (beats/min) and sevoflurane was 105±22 (beats/min).

The decrease in mean arterial blood pressure during induction was greater in patients receiving halothane than in those receiving sevoflurane, MAP of halothane was 61.45±0.47 vs MAP of sevoflurane was 77.96±0.28 which was similar with the study of Joel B. Sarner et al. (1995)[10] and they found MAP of halothane 63±16 vs MAP of sevoflurane 69±18. Our study suggests that sevoflurane is a satisfactory drug for the induction of anaesthesia in children compared with halothane.

The study concludes that induction of anaesthesia was faster with sevoflurane than halothane. Vital signs were stable with sevoflurane during induction period. Sevoflurane is an excellent drug for inhalation induction in paediatric patients.

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Original Article

Effect of peroperative use of granisetron and ondansetron on postoperative nausea and vomiting – a comparative study

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Abstract

Background *Post operative nausea and vomiting (PONV) is a common problem following general as well as regional anaesthesia. This causes great distress to the patient, may worsen surgical outcome and prolongs hospital stay. Prophylatic use of antiemetic in the preoperative or postoperative period reduces PONV.*

Objectives *The study was designed to compare antiemetic effects of intravenous use of granisetron and ondansetron in the peroperative period for prevention of PONV following elective gynaecological surgery under general anaesthesia.*

Methods *60 (sixty) patients undergoing elective gynaecological surgery (total abdominal hysterectomy) under general anaesthesia of ASA grade I and II aged between 35-50 years were selected randomly and divided into two groups (group 'O' & group 'G') of thirty patients each. Patients of group 'O' received intravenous Inj, ondansetron 0.1 mg/kg body weight & group 'G' received intravenous Inj. granisetron 2 mg bolus over 30 sec just before peritoneal closure. Both the group received a standard general anaesthesia. Postoperative analgesia was provided with diclofenac suppository (50mg) and ketorolac tromethamine 30mg intra-muscularly. In the recovery room occurrence of post operative nausea and vomiting was assessed for 12 hours. All data were compiled and analyzed for statistical significance by Student's 't' tests (unpaired). P<0 .05 (CL 95%) was considered as significance.*

Results *The incidence of post operative nausea and vomiting was reduced in both groups but no significant difference between the groups. No haemodynamic or psycho-mimetic adverse events were observed in the patients.*

Keywords: *Postoperative nausea and vomiting, ondansetron & granisetron.*

(JBSA 2011; 24(1): 18-22)

Introduction

Nausea, retching and vomiting are common among the post operative complications following surgery & anaesthesia[1]. Although often regarded by medical and nursing staffs as only a minor complication of anaesthesia and surgery, these are frequently the cause of great distress to patients and it is often the worst memory of their hospital stay.[2] In the past, the incidence of post-operative nausea and vomiting was reported to be as high as 60% (range 14-82%) following operation under general anaesthesia.[3] The aetiology of nausea and vomitnig after surgery is multifactorial in origin. Age, menstrual cycle, type of surgery and anaesthetic procedure may influence PONV.[4] Many drugs have been tried to prevent or alleviate this problem. The antiemetics that are currently being widely used for treatment in our country are prochlorperazine, metoclopramide and promethazine. But these drugs have varying effectiveness and their use is limited because of delayed recovery, sedation and sometimes distressing side effect of extrapyramidal symptoms.[5,6,7]. The introduction of $5HT_3$ receptor antagonist in 1990s was heralded as a major advance in the treatment of PONV because of the

absence of adverse effect that were observed with commonly used traditional antiemetics.[8,9] The commonly used drug ondansetron[8] 4 mg I/V single dose is the effective dose to prevent PONV.[10] Recently introduced another $5HT_3$ receptor antagonist granisetron has more potent and longer acting activity against cisplatin induced emesis than ondansetron.[11] Recent study demonstrated that granisetron reduces the incidence and severity of vomiting following strabismus repair and tonsillectomy.[12]

Methods

After obtaining approval of the institutional ethical committee of SSMC and Mitford Hospital 60 (sixty) women of ASA class I or II, scheduled for elective total abdominal hysterectomy were enrolled in the study. Written informed consent was taken from the patients. They were randomly divided into two groups of 30patients each. Group- 'O'**:** 30 patients received, ondansetron 8mg (4ml) intravenously (I/V) single dose just before peritoneal closure. Group- **'**G**':** 30 patients received, granisetron 2mg I/V single dose just before peritoneal closure. In the preoperative period, the procedure was explained to the patients and informed consent was obtained from each patient. In the preoperative period patients were also enquired about motion sickness, history of previous anaesthesia and postoperative emesis. On arrival of the patients in the operation theatre I/V line was inserted and pulse rate, blood pressure and respiratory rate were recorded. Patients were preoxyginated for three minutes and induction was done with fentanyl 1ìg/kg, thiopentone 5mg/kg, tracheal intubation was facilitated by suxamethonium 1.5mg/kg and general anaesthesia was maintained by halothane 0.5%, N_2O 60% with O_2 40%. nondepolarizing muscle relaxant vecuronium 0.1 mg/kg was given. Intraoperative proper hydration was maintained with Hartman's solution. Just before peritoneal closure ondansetron 8mg in Group 'O' patient and granisetron 2mg Group 'G' patient I/V was given. At end of operation patient was reversed accordingly with neostigmine 0.05mg/kg plus atropine 0.02 mg/kg and recovery was smooth and uneventful. Intraoperative and postoperative monitoring were NIBP, ECG, SpO^2.

In the recovery room post operative analgesia was provided with diclofenac suppository (50mg) stat and ketorolac tromethamine 30mg intramuscularly 8 hourly on complaining pain and repeated in all patients when necessary. For presence of nausea and vomiting, patients were interviewed at one hourly over the first 3 hours then at 3 hourly up to 12 hours postoperative period. The 12 hours study period was begun upon entry to the recovery room. The number and time of emetic episodes and the number & time of rescue antiemetic treatment was recorded. The rescues protocol constituted of granisetron/ ondansetron injected once. Patients were carefully observed for any adverse effect like sedation, drowsiness, flushing of any extrapyramidal symptoms.

Results

Demographic data of patients shown in table-I.

No clinically significant difference in heart rate in intraoperative and postoperative period were seen between the groups in time interval (Fig-1)

Statistically no significant difference was also observed in mean blood pressure during operation and postoperatively between the groups (Fig-2)

Statistically no significant difference was also observed in SpO^2 during operation and postoperatively between the groups (Fig-3)

Incidence of nausea and vomiting in different groups shown in table II

This study groups become statistically matched for age in years (Group O – 43.37±9.69, Group F 42.50±1.008), weight (Group O-51.43±12.00, Group F 50.50±1.53) and duration of surgery (Group O 71.50±1.950, Group F 71.07±1.894).

Table I *Demographic data*

	Age Mean ± SEM	Weight	Duration of surgery
Gr-O	43.37 ± .996	51.43 ±1.200	71.50 ±1.950
Gr-G	42.50 ± 1.008	50.50 ±1.153	71.07 ±1.894
t-value	0.612	0.561	0.159
P- value	0.543	0.577	0.874

Values was expressed as mean ± SEM . Between groups analysis were done by unpaired student's t test, P<.01 are significant.

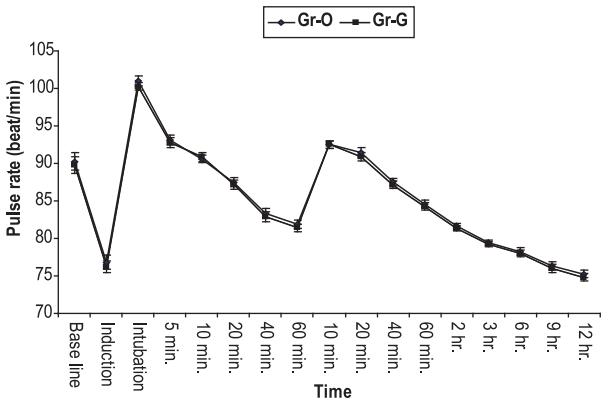

Fig 1 *Intra operative and post operative pulse rate changes of different groups*

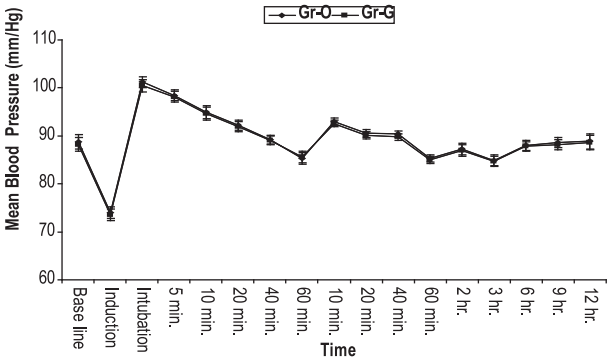

Fig 2 *Intra operative and post operative mean blood pressure changes of different groups*

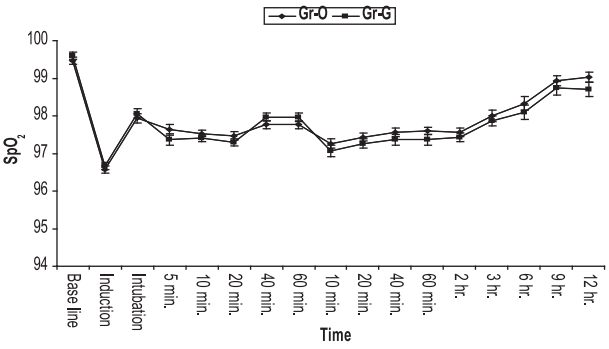

Fig 3 *Intra operative and post operative SPO_2 changes of different groups.*

Table II *Incidence of Nausea and Vomiting in different groups.*

Groups	Cases	Percentage
Group 'O' (n=30)	1	3%
Group 'G' (n=30)	1	3%

Incidence of nausea and vomiting in Group 'O' (3%) and Group 'G' (3%).

The incidence of nausea and vomiting in two groups were subjected to 'Z' test. No significant changes was observed between Group 'O' and Group 'G'.

Discussion

Nausea and vomiting are common and frequent complications following surgery and anaesthesia. Most of the incidence of nausea and vomiting occur during the first two hours of recovery from anaesthesia. The etiology of postoperative nausea and vomiting is multi-factorial. Many factor associated with anaesthesia and surgery may contribute to nausea and vomiting. In the present study concern factors are type of anaesthesia, female patient and gynecological surgery. Incidence of nausea and vomiting is two to three times more in female due to changing endocrine environment which sensitize the brain stem emetic mechanism. During elective gynaecological surgery, general anaesthesia as well as some traction of vagal innervated gut may play role in triggering emesis. The reported overall incidence of nausea and vomiting after gynecological surgery is 75%.[13]

The antiemetics are now mainstay of therapy to prevent PONV. The antiemetics that are now currently being widely used for treatment in our country are prochlorperazine, metoclopramide and promethazine and many study have done with these drugs. But these drugs have varying effectiveness and there use is limited because of delayed recovery, sedation and sometimes distressing side effect of extrapyramidal symptoms.[5,6,7] Malins et al. have also studied the efficacy of ondansetron compared with metoclopramide.[14] Alon & Himmelseher studied the efficacy of a single intravenous dose of ondansetron 8mg, droperidol 1.25 mg and metroclopramide 10 mg given preoperatively to gynaecologicla patients undergoing dilatation and curettage.[15]

Granisetron is a newer drug and limited studies have done with this drug in our country. So we have chosen ondansetron and granisetron for prevention of PONV in elective gynaecological surgery to compare these drugs about their efficacy and side effects during operations and 12 hours post operative period.

In the present study incidence of nausea and vomiting in group-O (those received Ondansetron

8 mg) is 3% and in group-G is 3%. Both ondansetron and granisetron decreases nausea and vomiting significantly ($P<0.05$) in comparison to older antiemetics. But the comparison between group-O and group-G for prevention of PONV following elective gynaecological surgery is similar. In one study M Naguib[16] with his co-worker shows that prophylactic antiemetic treatment with ondansetron resulted in a lower incidence of PONV than with metochlopramide and placebo in a randomized double blind comparative study on laparoscopic cholecystectomy. In another study Dipasri Bhattacharya[17] et al shows that granisetron is much better than ondansetron for prevention of PONV following day case gynecological laparoscopy in a randomized double blind technique. In another study D. Bridges[18], BS (Pharm) showed that low dose granisetron was equally effective as ondansetron, dolasetron with no toxicity in female patients at high risk for PONV. In our study most of the incidence of PONV occur with first two hours after surgery in two groups but in rest of the period no nausea and vomiting occur which is similar with the study of Dr. Bridges[18]. It has some dissimilarities with the study of Naguib[16] and Dipasri Bhattacharya[17]. The aggravating factor for PONV in general anaesthesia are anaesthetics agents, distention by gas, per and postoperative use of narcotics. But in our study the possible aggravating factor are female patient general anaesthesia, vagal irritation.

Regarding hemodynamic changes SpO_2, during operation and 12 hours post operative period no clinically significant changes occur. No other adverse effect like headache, constipation and flushing during operation and 12 hours postoperative period were observed in this study.

Pain as well as commonly used analgesic pethidine may cause nausea and vomiting. For this reason postoperative control of pain we used ketorolac tromethamine and diclofenac as required instead of pethidine. The study confirmed the previous study regarding the safety of the patient as side effects were mild.

Conclusion

Both the ondansetron and granisetron have similar antiemetic efficacy.

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Review Article

Interventional pain management procedure for treating low back pain: anaesthesiologists should come forward

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Key words: Low back pain, intervention pain management

(JBSA 2011; 24(1): 23-27)

Introduction

Although the variety of specialists caring for patients with chronic pain is broad, anesthesiology is the speciality that represents the majority of physicians who use interventional approaches in the treatment of low back pain. Anesthesiologists who consider themselves as interventional pain management specialists agree that the spectrum varies widely from those who use only epidural steroid injections in a recovery room setting to those who are fellowship-trained and exclusively provide image-guided spine intervention.

Training and skill level among such anesthesiologists vary widely, mainly because until recently, no common comprehensive standards or guidelines existed for interventional pain management physicians. This situation changed in 2001 as the result of the establishment of guidelines set forth by the American Society of Interventional Pain Physicians[1] and more comprehensive practice guidelines recently published by the International Spine Intervention Society (ISIS).[2] As these standards become more commonplace in this specialty, the gap of varied skill levels and training will narrow with the expectation of improved outcomes based on randomized control trials that are ongoing to further delineate more accurate guidelines for each specific procedure.

Image-guided spine intervention is used primarily for its precise diagnostic capabilities. This article reviews basic principles of the more common image-guided diagnostic techniques specifically as they relate to patients with low back pain. It also includes discussion of advanced modes of therapy, including spinal cord stimulation and intrathecal therapy, providing primary care physicians with an understanding of the primary indications for these therapeutic modalities.

Low Back Pain

Low back pain is a major health and socio-economic problem throughout the world. The lifetime prevalence has been estimated at anything between 59% to 90%[3]. In any one year, the incidence of back pain is reported to be ~5% of the population.[3] Though we have no definite data in Bangladesh but incidence is quite high. The symptomatology of LBP is nonspecific with many possible etiologies. The lumbar spine is a complex structure, and for many years, treatment of patients with LBP was based on speculation. Limited understanding of lumbar spine anatomy, specifically neuroanatomy, and a lack of knowledge of functional anatomy contributed to this approach to treatment. The concept of precisely diagnosing a potential anatomic structure responsible for generating LBP rests on the idea that for a structure to be a source of pain, it must have a nerve supply. Hence, a diagnostic nerve block can be administered to test this hypothesis.[4] Based on several studies by Schwarzer et al,[5-9] Bogduk[10] postulated that precision diagnostic injections can assist in formulating a specific diagnosis in 70% to 80% of those who suffer from LBP.

With respect to the relative contributions of various structures in chronic LBP, Manchikanti et al[11] evaluated 120 patients with a chief complaint of LBP by administering precision diagnostic

injections. These injections targeted facet joints via medial branch blocks, intervertebral discs via provocation discography, and sacroiliac joints (SIJs) via intra-articular injections. They concluded that the facet joint contributed to chronic LBP in 40% of the population, the intervertebral disc in 26%, and the SIJ in 27%. Anecdotal experience among physicians at Advanced Pain Consultants PA, in Voorhees, NJ, indicates that the intervertebral disc is the more frequent significant source of chronic LBP than are lumbar facet joints.

Facet Joint Pain

Osteoarthritis and trauma are among the most common conditions leading to pain emanating from facet joints. The primary symptom of pain emanating from this site is that of LBP. By injecting a solution of 10% hypertonic saline solution in the region of the facet joints, Hirsch and colleagues[12] demonstrated that pain can be created in the upper back and thigh regions. Pain frequently is also referred into the groin, buttocks, hip, or lateral and posterior thigh regions (or a combination of these sites). Pain is often described as a "deep, dull ache" and may be either unilateral or bilateral. On physical examination, there may frequently be increased pain with extension, tenderness to palpation over the affected joints, and normal findings on neurologic examination. Electrical stimulation of the medial branch nerves has also assisted in identifying referral pain patterns.[13]

Facet joint injections or medial branch nerve blocks are primarily diagnostic tools. An intra-articular facet injection usually includes use of a steroid such as methylprednisolone, which theoretically reduces inflammation within the joint, thereby potentially reducing pain. However, injecting steroid into the facet joint does not usually provide lasting relief. Dreyfuss et al[14] have demonstrated that clinically significant and prolonged relief from back pain can be achieved with radiofrequency neurotomy of the lumbar medial branches. Patients' pain must be carefully diagnosed with controlled diagnostic blocks of the lumbar medial branches.

Sacroiliac Joint Pain

There is no scientific evidence that history or physical examination can accurately identify the SIJ as a source of pain, controlled intra-articular injections are the only available means of identifying this site as causing such discomfort.[15,16] Because innervation of the SIJ is poorly defined and most likely complex, pain emanating from here cannot be diagnosed using nerve blocks. Intra-articular injection of a local anesthetic (e.g. lidocaine or bupivacaine hydrochloride) into the SIJ is the technique of choice used to prove or disprove that it is the etiologic factor.

Discogenic Pain

Provocation discography involves injection of contrast medium into the disc nucleus to define its morphology; this increase in intradiscal pressure allows simultaneous evaluation of the patient's response to pain reproduction. Therefore, provocation discography can determine if this anatomic location is a pain source. It is based on the concept that if a particular disc is the source of pain, stressing it should result in reproduction of that pain. Furthermore, if the disc is not the source of pain, then when stressed, it should either not cause pain or it may produce pain that is atypical (disconcordant) of the underlying pain. Immediately following provocation discography, computed tomography (CT) scanning is done to obtain a static axial view of the intervertebral disc to evaluate the degree of annular disruption. Sachs et al[17] developed the Dallas discogram scale, which grades disruption of the annulus on a four-point scale. A normal nucleogram, one in which contrast is entirely contained within the nucleus, is considered a grade 0 disc. Grades 1 to 3 describe extension of the contrast medium to the inner third, middle third, and outer third of the annulus fibrosis, respectively. Examples include a posterior radial fissure at L4–5 with contrast extravasating into the anterior epidural space and a grade 3 posterolateral annular disruption on the postdiscography CT scan.

Ozone disc nucleolysis and epidural steroid

Outcome studies of lumber disc surgeries document a success rate between 49% to 95%.[18] Reasons for this failure are: 1) dural fibrosis, 2) arachnoidal adhesions, 3)muscle & fascial fibrosis 4) mechanical instability resulting from the partial removal of bony and ligamentous structures required for surgical exposure and decompression leading to facet & sacro-iliac joint dysfunctions, 5)

radiculopathy, 6)recurrent disc herniation.[19-21] There has been surge of interest in search of safer alternative method of decompressing the nerve roots maintaining the structural stability. Undoubtedly, the epidural steroid injection [ESI] is the precursor of the more specific spinal injection procedures done today and the most familiar to primary care physicians. Epidural steroid injection, transforaminal epidural procedures has a high success rate (up to 84%) but chances of recurrences are also high.[22-24] Chemonucleolysis using chymopapain has moderate success rate (approximately 66% at one year).[25, 26] It has also the chances of anaphylaxis following intradiscal chymopapain injection. Injection of ozone for discogenic radiculopathy (low back pain with radiation to legs) has developed as an alternative to chemonucleolysis and disc surgery popularly called ozone therapy for slip disc. Owing to its high success rate, less invasiveness, fewer chances of recurrences and remarkably fewer side effects ozone therapy for slip disc is becoming very popular.[27-29]

How does ozone therapy work? The action of ozone therapy is due to the active oxygen atom liberated from breaking down of ozone molecule. When ozone is injected into the disc the active oxygen atom called the singlet oxygen or the free radicle attaches with the proteo-glycan bridges in the jelly-like material or nucleus pulposus. They are broken down and they no longer capable of holding water. As a result disc shrinks and mummified and there is decompression of nerve roots.

Radio frequency procedures

Different radio frequency procedures are essential in pain management. It is the best form of treatment for trigeminal neuralgia, different types of cancer pain and spinal pain including low back and neck pain.

There are two types of Radio Frequency pain management procedures. The older one is Conventional Radio Frequency where heat is generated which is producing the lesion and stopping the pain signal. The newer one is Pulsed Radio Frequency where a strong electro-magnetic field is produced around the nerve which is stopping the pain signal. Here the normal function of nerve is maintained and only abnormal pain is stopped.

Advanced Therapies

Spinal cord stimulation and intrathecal therapy are advanced therapeutic modalities used for treating patients with chronic intractable pain. They are essentially reserved for patients in whom continuing pain is not the symptom, but rather the disease. Together, these modalities consist of technology that is considered "neuromodulatory."

Vertebroplasty may be used for patients with vertebral compression fractures due to osteoporosis, metastatic tumors, or benign tumors such as vertebral heamangiomas. Patients with metastasis and myeloma usually experience severe pain and disability.

Vertebroplasty is performed to provide pain relief and to produce bone strengthening and vertebral stabilization when the lesion threatens the stability of the spine.

Conclusion

Low back pain usually is self-limiting, but when it persists and is unresponsive to rehabilitation and analgesics, precise determination of the source of pain becomes key to planning proper treatment. Patients with LBP may demonstrate varied clinical scenarios, none of which, unfortunately, helps in determining the exact source of the pain. A precise spinal diagnostic evaluation can identify the correct anatomic site of such discomfort in most patients. Different interventional pain management procedure is to be applied to treat this group of patients. Definitely success depends on skill of interventionist. Though blind epidural steroid injection is practiced for LBP by our interventionist as common therapeutic procedure but use of image-guided procedures would be practiced for better outcome. Anaesthesiologists should come forward to take proper role in managing such type of patients after taking proper knowledge on anatomical, pathological and image tecqnique.

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Acupuncture: a traditional chinese medicare

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(JBSA 2011; 24(1): 28-33)

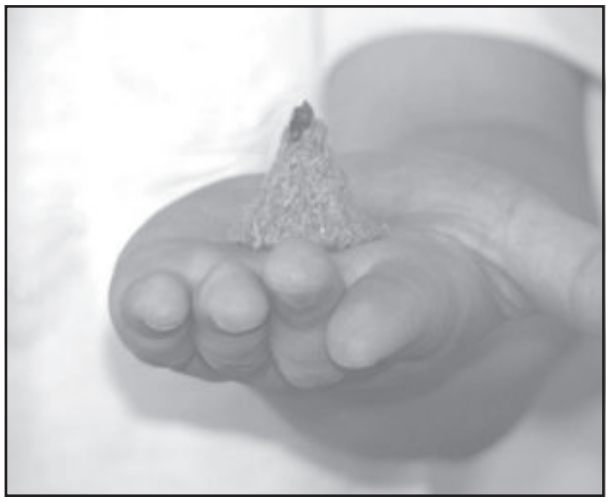
Introduction

The Traditional Chinese Medicine (TCM) is one of the oldest systems of Medicare to treat ailments which has history of about three thousand years. It includes different therapeutic techniques like Acupuncture, Moxibustion, Tuina & Guasha messages, Cupping, Herbal medicine, Meditation, Exercise and life style change. Among these techniques, acupuncture is the major and most integrated component of TCM. The term "acupuncture" is given in the Western World for treating illness with special needle which is pushed into the skin in a particular part of body. The term is derived from Latin word "Acus" meaning needle and "Punctura" for prick. To the Chinese, Zhe`n bea`n is a practical science of inserting and manipulating needles into specific points (acu-points) on the body with the aim of preventing and treating diseases. It is a drug free process of treatment which encourages the body to promote natural healing. The Traditional Chinese Medicine (TCM) is based on the belief that every organ is connected with each other and work together to keep the body functioning with the help of flow of energy called Qi(chi). It flows in the body via channels called meridians. Imbalance in the flow of Qi (chi) is the reason behind different ailments. In TCM, there is a belief that all things in the universe are persisting in two cosmic regulations known as Yin and Yang. The sum of total Yin and Yang are balanced. It is perceived in TCM that illness caused by an imbalance of Yin and Yang in the body. It is also believed that the balance of Yin and Yang only exists when Qi flows freely through a system of tracts. The disease develops when the flow of Qi is obstructed causing an imbalance between Yin and Yang. It was attempted to get rid of obstruction by inserting needles into these tract which is known to the Western World as acupuncture.

Global spread and fluctuation in popularity of acupuncture in China

Acupuncture is one of the oldest methods of treatment in the history. The Chinese fast carried out acupuncture that seemingly a strange practice whereby needles are inserted into skin for therapeutic purpose at least 3000 years ago. News of this however, did not reach the Western World until 300 years ago when European medical officer employed by the Dutch East Indian Training Company in Java saw it being used by the Japanese. From the 17th century onwards missionaries from Europe in bringing the Christian religion to China, also brought with them the Western form of medical practice. After that, practice of acupuncture gradually replaced by Western Medicine. Beside this, acupuncture became chaotic due to Japanese occupation, civil war and lack of doctors trained in this type of medicine. In 1882, the emperor of the Qin dynasty commanded all hospital to stop practicing acupuncture. After the Communist revolution in 1949, the Chinese communist leader Mao Tse Tung integrated Western medicine with TCM that both being taught in the medical collages. From that time, most hospital in China offered both form of treatment to their patients. President Nixon visited China in 1972. He was impressed by acupuncture treatment. His personal physician was so impressed that, on returning to America, he generated a wave of enthusiasm that have helped to occupy a vital position beside the Western medicine.

Herb Shop



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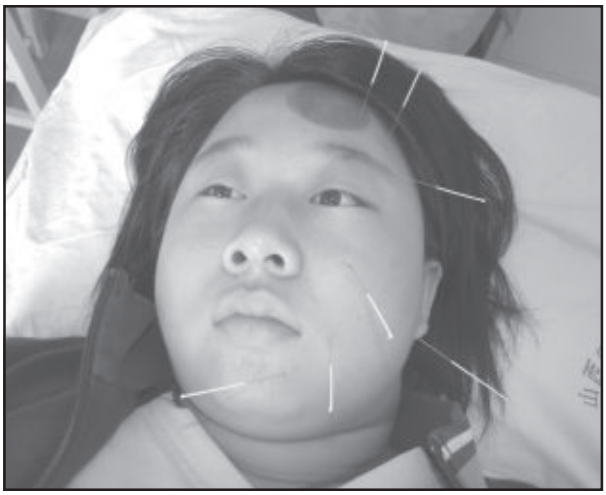
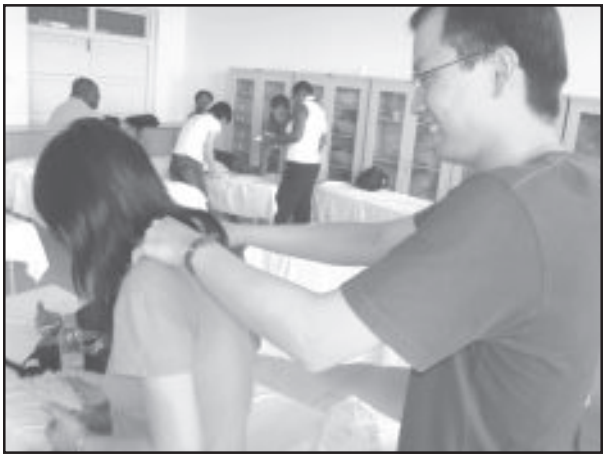


Acupunc Ture & Cupping Mark

Cupping in cervical spondylosis



Tuina (chinese medical massage)

The Concept of TCM

The philosophers and physicians in ancient China believed that the original state of universe was "Qi" (Chi), the most active invisible vital energy, the constant motion of which produces all things in the universe. The accumulation of "Qi" would produces life while the dispersion of "Qi" would put an end of life. The TCM theory is based on this "Law of the Universe". According to TCM theory- the structural and functional units of the human body achieve two aspects, `Yin and Yang`. The Yin and Yang is due to constant motion of Qi. So part of Qi have Yang properties while the other part have Yin properties. The Yin Qi circulates around the body in the blood vessels while the Yang Qi travels outside them in a completely separate system of channels or tracts. Anatomically these tracts are not demonstrable. But to the Chinese, these tracts are very real who believed that the intricate network of channels and tributaries were similar to the rivers and its tributaries and canals which together make up the water ways of the earth. This system of channels or tracts is known as "acu-tracts". It should be noted that modern Western writers often refer to the Chinese acu-tracts as "meridians". But many Chinese did not like to accept the term.

The meridians are linear routes run vertically, bilaterally and symmetrically dividing into several levels of branches which are interconnected with each other to from a network. The main function is to transport Qi and blood, through Yin and Yang, connect the organs and to regulate the physiological and pathological functions of the body.

The Meridian system consists of 12 primary meridians, their branches and collaterals along with 08 extraordinary vessels. The human body composed of internal "Zang organ" (Spleen, Heart, Lung, Kidney and Liver) and "Fu organ" (Stomach, Large Intestine, Small Intestine, Gallbladder and Urinary bladder) along with external sensory organs, limbs and skeletal system. So there are only ten principal organs, 5 with Yin characteristics and other 5 with Yang characteristics. Subsequently they included pericardium amongst the Yin organ and San Jiao (triple warmer) amongst the Yang organ. These meridians are functionally dependent on each other and make the whole body as units known as "Wholism". It is nourished by blood and body fluid through meridians and collaterals circulated by the propelling action of `Qi`. The theory also holds that the normal activity of life results from the balance between Yin and Yang to harmonize the functions of Zang-Fu organs. The Qi move through each of 12 channels comprising an internal (related to Zang –Fu organs) and external (Acu-tract) pathways. According to traditional Chinese teaching, the purpose of inserting needles into acu-points in a disease is to make free flow of Qi in acu-tracts and there by correct the imbalance between Yin and Yang. The Nei Ching in several places says that there are 365 acu-points. A figure no doubt arrived at because of its symbolic association with the number of degree in a celestial circle, the number of days in a year and the number of bones in the human body. Among them only 160 points actually receives names. The acu-points are the spots on the meridians and vessels where Qi and blood from vessels and meridians effuse and infuse in the body surface. To treat and prevent a disease, acu-points are punctured by Needles to balance Yin-Yang character and to harmonize the functions of the organs. Acu-points are usually located in the interstices in muscles or between tendons and bones. One acu-point may be used to treat many diseases and several types of acu-points may be used to treat a single disease .There is no generally accepted anatomical and histological basis for the concept of meridians and collaterals and acu-points. But the modern Acupuncturists tend to view them in functional rather than structural terms.

Twelve primary meridians or channels:

YANG Meridians

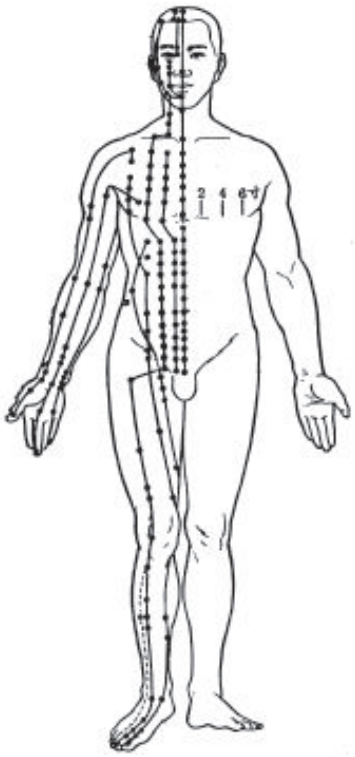
1. Large Intestine channels (LI)
2. Small Intestine channels (SI)
3. Stomach channels (ST)
4. Gall Bladder channels (GB)
5. Urinary Bladder channels (UB)
6. Triple Warmer (San Jiao Meridian) (TW)

Yin Meridians

1. Lung channel (LU)
2. Heart channel (HT)
3. Spleen channel (SP)
4. Levier channel (LR)
5. Kidney channel (KI)
6. Pericardium channel (PC)

Extra channels

1. Governor channel (DU)
2. Conception channel (REN)



Meridians & Acupoints

Mode of acupuncture

There are two modes of acupuncture – Body acupuncture and Auricular acupuncture. While classical body acupuncture was first developed in China over 3000 years ago, its use diminished in the 1800's, when China was dominated by Western

powers from Europe. But it was fortuitous that the discoveries of the ear acupuncture charts by Dr. Paul Nogier of France arrived at this time in a renewed interest in acupuncture techniques. Nogier's inverted fetus picture of auricular points are connected to every parts of the body. Though both ear and body acupuncture had their origin in China, Ear acupuncture differs from the body acupuncture in many ways. The Ear Acupuncture is a self contained micro-system that affects the whole body.

Pathogenesis

TCM believes that healthy state implies the dynamic balance of Yin and Yang manifested by high coordination and unity between viscera, the meridians, Qi (Chi), blood and body fluid as well as the body and external environment. If it is broken by various pathogenic factors, disease will be caused. The pathologic factors causing diseases are: six abnormal climatic factors, five endogenic factors, seven emotions, improper diets, over works, over rest etc. Healthy Qi fights against pathogenic factors to maintain normal Yin- Yang balance and harmony of organs in normal life. If the healthy Qi is impaired, Yin-Yang balance is damaged, meridians functions are disordered and flow of Qi and blood is stagnated or disturbed.

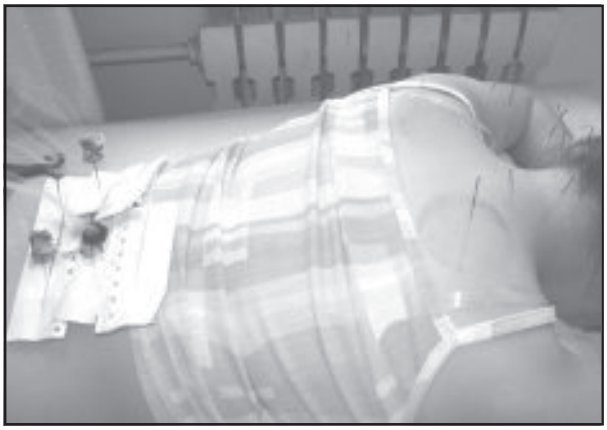
Therapeutic Principles

Treatment of disease is attempted by modifying the activity of one or more functions through the activity of needles, pressure, heat, etc. on acu-points. Acupuncture therapy stimulates the meridians to promote free flow of Qi and Blood were there is stagnation and thereby maximize where there is deficiency and drain where there is excess and in this way harmonize the vital activity of the body.

Indications

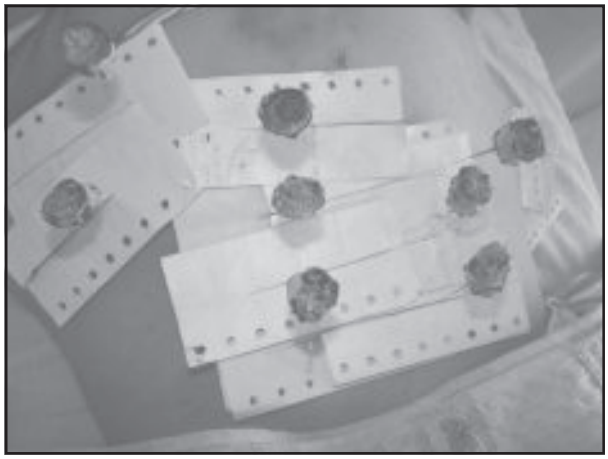
The acupuncture therapy is effective in treating about 300 diseases. Among these diseases, it seems to be particularly effective in treating –

Various chronic pain Musculo-skeletal disorder; Symptomatic relief of all kinds of arthritis; Nausea and Vomiting induced by pregnancy, motion or anaesthesia; Asthma and other allergic disorder of skin; withdrawal of narcotics, smoking or alcoholism etc. Beside these, **FDA** approved **the American Academy of Medical Acupuncture** to treat the following diseases with acupuncture:- Abdominal distention/flatulence, Constipation, Diarrhea, Nausea and vomiting, esophageal spasm, hyper-acidity and Irritable bowel syndrome; Acute and chronic pain diseases; Anorexia, Anxiety, fright and panic; Arthritis, Cervical and lumber spondylosis, frozen shoulder, bursitis, tendonitis, carpal tunnel syndrome; Cough, persistent hiccups; Premenstrual syndrome, Dys-menorrhea and pelvic pain; Headache, vertigo and tinnitus; Idiopathic palpitations and sinus tachycardia; Muscle spasms, tremors, tics and contractures; Neuralgias (trigeminal, herpes zoster, post-herpetic); Phantom pain, Planter fascitis; Post-traumatic and post-operative ileus; Allergic manifestation along with urtecaria, pruritus, eczema, psoriasis; Sequelae of stroke syndrome (aphasia, hemiplegia), Seventh nerve Palsy; Severe hyperthermia, Sleep disorders; Sprains and contusions, Tempero-mandibular joint derangement; Urinary incontinence and retention.

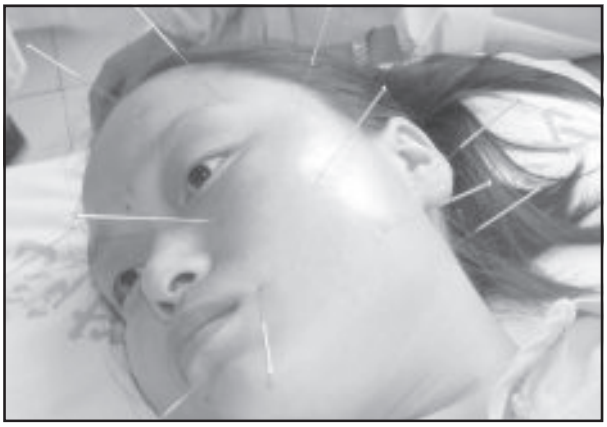


Cervical and lumber spondylosis

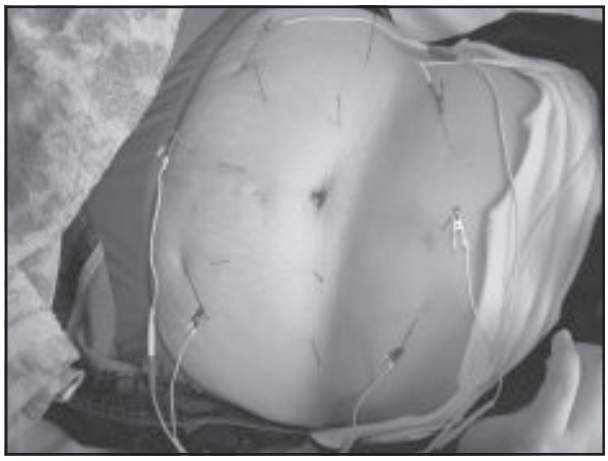
Acupuncture and moxibustion in lumber spondylosis



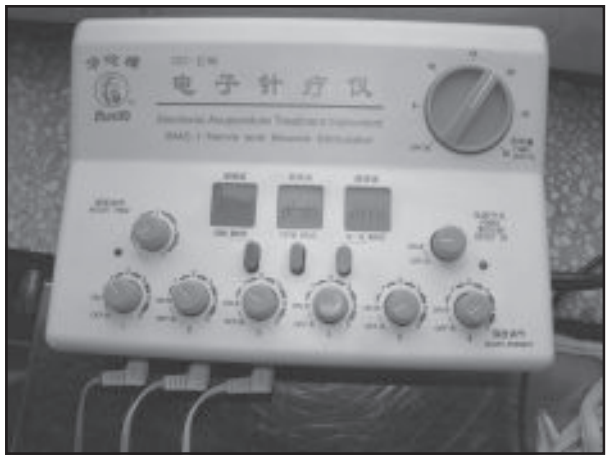
Acupunture in facial palsy



Acupuncture in facial palsy



Acupunture with electrical stimulation in obesity



Electronic Acupuncture Treatment Instrument

Contraindications

There is no specific contraindication for acupuncture therapy. Still it is advised not to perform acupuncture during fasting or overeaten, drunken or over fatigued condition; or in pregnancy, bleeding disorder, infection, ulcer, scars ect.

Adverse Events

There is belief that acupuncture is completely safe. However, many acupuncturists encounter side effects which are related to direct visceral puncture. Various infection and electrical hazards have also been reported. Beside these, stuck needle, bent needle, broken needle, minor bleeding, haematoma, fainting, nerve injury, pneumo-thorax, pregnancy termination were some times reported.

Scientific Basis for Mechanism of Action

Some studies suggest that the analgesic action of acupuncture is associated with release of endogenous opioids like encephalin, endorphin and dynorphin in the brain which modulate pain pathways and this effect can be reversed by using Naloxone. In other word, acupuncture therapy act according to the Gate control theory of pain where it stimulate A b.

Modern Studies

The research on the meridians or acu-tracts, demonstrated that acupuncture causes a changes of electric current or potential which is conducted directly by the skin. Some other research data also showed that there is a regularity of electric charges between the meridian, collaterals and acu-points. Other research workers think that the meridians and collaterals are the electromagnetic waves formed by electrons or electron beams traveling along these specific pathways. For this reason they applied a high magnetic body to the acu-points for the purpose of regulating the abnormal electric activities of the meridians and collaterals. This is known as "magnetotherapy"

Conclusion

Acupuncture is cheap, safe and almost without side effect. But it is quiet complex and usually difficult to comprehend. Because the science is based on belief that body is inter-connected. The mind and body are not separated. The vital force that controls the body and mind is Qi. It flows through the meridians. Another important concept of TCM is the theory of Yin and Yang, which is based on belief that all things in the universe are either Yin or Yang. These two aspects are opposite but

complementary to each other, as without Yang, there would be no Yin. Yang is generally associated with bright, warm or motion, whereas Yin is generally associated with dark, cold or still. Illness is caused by imbalance of Yin and Yang in the body.

Acupuncture stimulates a regulatory system of the body eg. Nervous, hormonal and bio-chemical systems to maintain normal Yin and Yang balance and in this way harmonize the vital activity of the body.

References and further reading:

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2. Diagnostics of Traditional Chinese Medicine.
3. Science of Chinese Meteria Medica.
4. Science of Prescription
5. Internal Medicine of Traditional Chinese Medicine
6. Chinese Acupuncture and Moxibustion
7. Chinese Tuina (Massage)

Case Report

Anesthesia for separation of conjoined twin a case report

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Abstract

Pygopagus is a rare type of conjoined twins and the incidence is about 6% and these babies are united dorsolateraly in the sacrum and the perineum. Conjoined twins were being separated with increasing frequency and success, concomitant with the improvements being made in the care of pediatrics surgical and anesthesiologist team. The conjoined twins which were presented to us for anesthesia were female pygopagus.

They were born on March 21, 2010 in remote village of Sylhet, at home by an uncomplicated vaginal delivery. At birth, the twins were 2.8 kg attached at their back. They baby was separate organ system except a common anus. The operation was to be performed on the lower intestinal tract and on the nervous system at the same time it was decided to include a neurosurgeon in this team. At the age of 100 days when both weight 5.4 kg general condition was good, two team of surgeon and anesthetist, at beginingone operation table two anaesthesia machine with individual monitoring device required preponed. Since surgery was uneventfully. Despite this decision or per haps even because of it, there was no infection postoperatively. The twins recuperated well from their adventure.

Keywords: *Conjointed Twin, Pygopogus.*

(JBSA 2011; 24(1): 34-37)

Introduction

The first historical reference of conjoined twin may be found in writings of Pliny, but the earliest fully described case is probably that of the Maids of Bidden den in Egypt in 1100[1]. The earliest attempt at separation of conjoined twins is recorded as occurring in Armenia in 970AD[2]. To date over 1200 cases of conjoined twins and approximately 250 successful separations in which one or both twins have survived over the long term have been reported. In our country, for the last 10 years, conjoined twins were being separated with increasing frequency and success, concomitant With the improvements being made in the care of pediatric surgical and anesthesiologist team. Pygopagus is a rare type of conjoined twins and the incidence is about 6%[3] and these babies are united dorsolaterally in the sacrum and the perineum. The conjoined twins which were presented to us for anesthesia were female pygopagus. They were born on March 21, 2010 in remote village of Sylhet, at home by an uncomplicated vaginal delivery. Their 32years old mother previously gave birth to a normal baby. At birth, the twins were under weight in good general condition, despite the fusion at their back. The combined weight of the twins were 2.8 kilograms, due to firm adherence of the lower part of back to each other, they got admitted in the divisional hospital after 2days of birth. Examination by pediatric and surgical teams revealed that the tiny pygopagus posses a common anus which belonged to the twin on the right (Sabia).

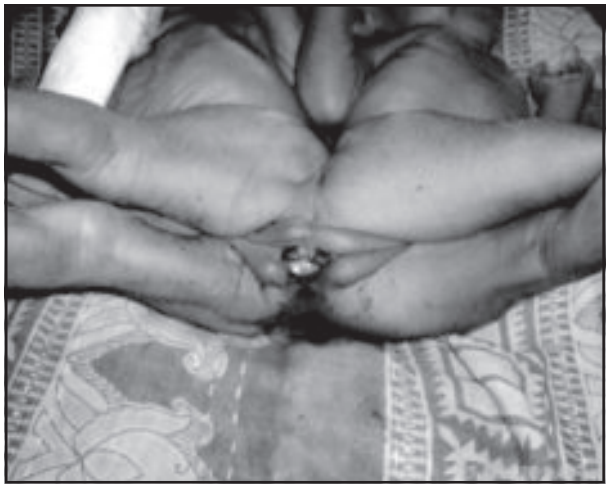

Fig 1

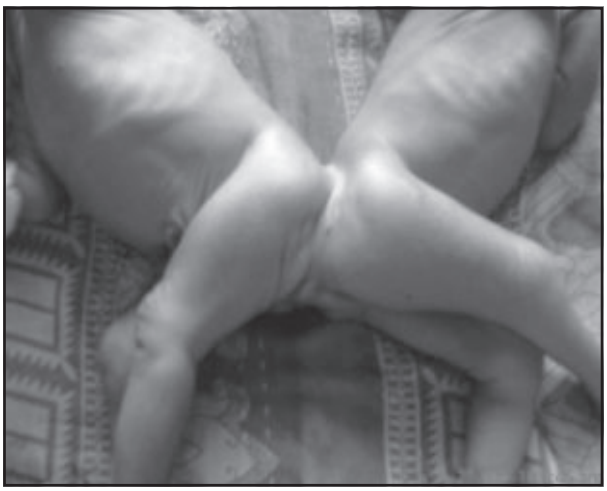

Fig 2

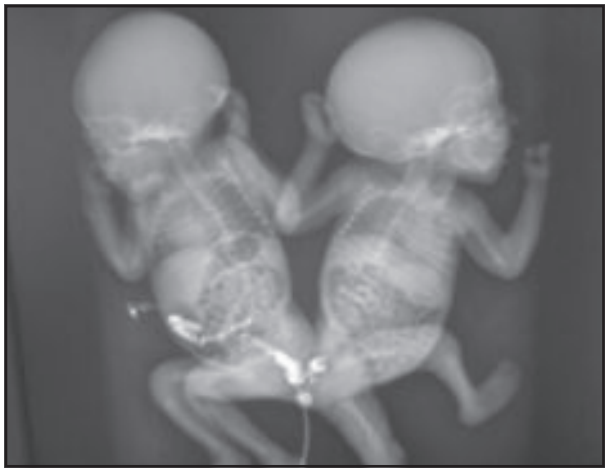

Fig 3

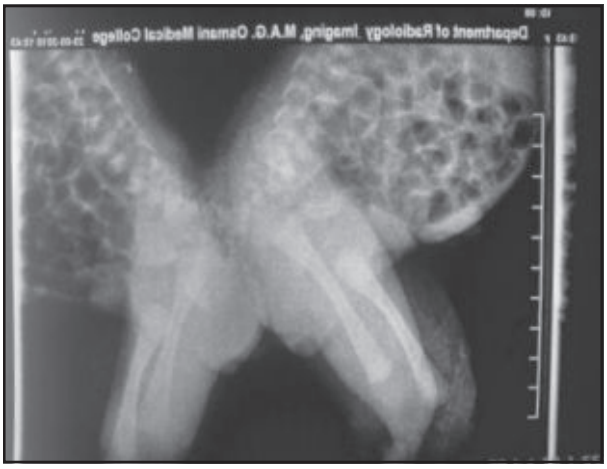

Fig 4

Demonstrated fusion of vertebral (sacro-coccygeal) region up to posterior fourchette, each have individual genito-urinary tract, liver, umbilicus, limbs but have single anus. The two nervous systems seemed nevertheless intact (Fig-1,2 3,4). It was decided that surgical intervention was indicated and a joined meeting with the department of anesthesia and surgery was requested to plan the order of procedure between 3-4 months. The optimal time for separation is 4 and 11 months[4] later separation presents concerns about the twins, psychological states after separation and in the younger group; organ immunity and accuracy of investigations are factors to consider. Technically for anesthesia, bigger is easier. Operative survival is 50% in the neonatal period compared with 90% if surgery is performed after 4 months of age. This may reflect the severity of the problem, the nature of the conjunction and, or the need for urgent separation, rather than age of the babies per se[5].

Planning

Since the operation was to be performed on the lower intestinal tract and on the nervous system at the same time it was decided to include a neurosurgeon in this team. At the age of 100 days when both 5.4 kilogram, general condition was good, two team of surgeon and anesthetist, at begining one operation table. Two anesthesia machine with individual monitoring device required prepared.

Planning of separation of single anus and vertebral column in one sitting decided. Identification of each child using color coding of equipment, monitoring devices, and limbs and head is very useful at this time.

Anesthetic Technique

1. Personnel. Responsibility for the anesthesia was assigned to two teams of anesthetists; each team consisted of an anesthetist in charge. Anesthesia assistant and trained nurses.

2. Anesthesia : The extent of shared vasculature affects drug pharmacokinetics and pharmacodynamics, as well as fluid and blood administration. Significant cross circulation may confuse and complicate investigations and monitoring. Communication between the two anesthetic teams is vital. Cross circulation may be quantified by studies using contrast media, drug administration, or radio isotope injection into one body and measurement of the uptake in the other baby[6.7]. As the Sabia (right) and Sadia (left) were lying on their corresponding lateral position, so induction and intubation were very difficult in thus position. Separate drugs, different sizes endotracheal tube laryngoscope with different size blade, mask were prepared. Anesthesia was induced first of all in Sabia by mask with equal parts of oxygen and nitrous oxide and 1.5%– 2% concentration of halothane. An oral endotracheal tube was easily placed without the use of muscle relaxants. The natural lateral positions adopted by the twins allowed intubation without change of position. The other twin Sadia was incubated with some difficulty with the same technique and procedure and drugs. General anesthesia was maintained with the same mixture of oxygen and nitrous oxide supplemented by 0.5% to 1% halothane as required. As muscle relaxants Inj. atracuronium was used. The duration of operation was three and half hours, during anesthesia; controlled ventilation was maintained for both the babies.

The intraoperative monitoring for separation of conjoined twins does not differ from any major pediatric surgical procedure. The only differences are that with conjoined twins, all equipments must be double. the room temperature of operation theatre was maintained at 28 c.

Parenteral antibiotics started 24 hours before surgery. We have given Ceftazedime, Metronidazole and flucloxacilline according to body weight in separate infusion line. Antibiotic start Preoperatively and continued up to 7th post operative day.

To follow cardiovascular function, each twin was filled with a pre-cordial stethoscope, child- pulse oxymetry and NIBP.

Initially, adrenal suppression was cited as a common cause of circulatory collapse during separation, leading to a recommendation for peri-operative steroids[5.8]. Circulatory collapse due to (especially with pelvic bony separation of pygopagus twins) unappreciated blood loss resulting in intravascular insufficiency and undiagnosed cardiac abnormalities are considered. The most complicated monitoring was indispensable for evaluation of the individual blood losses of conjoined twins. Gravimetric evaluation of the blood loss during the separation suggested a total loss of 180ml. This represented 25% of combined blood volumes of the twin. In order to divide the transfusion appropriately, we were obliged to rely on the monitored parameters as observed for each twin. During separation Sabia (right) received 120ml and Sadia (left) 60ml only. After separation, it was much easier to estimate individual losses, Sadia, who under went on anoplasty, lost an additional 80ml, which was replaced, Sabia who possessed their common anus, therefore did not need an anoplasty. She lost only 30ml after separation, and this was also replaced. It is noteworthy that, in totals each twin received 120ml of blood during the operation and that an arbitrary division of blood loss would have given the same result. One must not forget, however, that the timing was very different in the two cases. Sabia received most of her transfusion during separation, whereas Sadia received most of hers after separation. To compensate for insensible losses, each twin received, during the procedure 4 to 5 ml of intravenous fluid (0.225% 1/5 normal saline/kg/hr).

Conclusion

So it is concluded that separation of conjoined twin presents a challenge to the anaesthetist. We believe, however, that only paediatric anesthetist, is well prepared to face this type of situation. The

principal problems we had to a face were the evaluation of the individual blood losses and congestion of the operating room. The presence in the same operating room of two anesthetic teams, two surgical teams with assistant, cameras, all surrounding two tiny twins together 4.6 kilogram certainly might be called, "congestion". If we add to this impressive entourage all the monitoring equipment connected to the two patients, movements became impossible. For the reason closure of the wound was continued after the separation on the same operating room instead of transferring one twin to another suit, as had been originally envisaged. Despite this decision, or perhaps even because of it, there was no infection post-operatively. Infection was feared because of the simultaneous opening of the spinal canal and digestive tract during the same procedure. The twins recuperated well from their adventure and left the hospital June 15,2010 at the age of 115 days.

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Obituary

Dr. Ehsanuyl Haque

Dr. Ehsanuyl Haque was born in the month of September 17, 1951 at Chilmari, Kurigram. He got himself admitted in the Mymensingh Medical College in the year 1976 and passed MBBS from Mymensingh Medical College in the year 1981.

He was posted in Mymensingh Medical College as Anaesthesiologist. In the department he was given the important task of further developing the anaesthesia department thereby improve the anaesthetic service.

He was an member of Bangladesh Society of Anaesthesiologist and took active part in different activities of the society.

Dr. Ehsanul Haque, a good soul left this world on March 28, 2011 with cardiac arrest.

Dr. Maya Shah

Dr. Maya Shaha was born in the month of August 7, 1958. She got herself admitted in Mymensingh Medical College and passed MBBS from Mymensingh Medical College in 1983.

She was posted in Mymensingh Medial College Hospital as Anaesthesiologist. In September 11, 2003. She was posted in Narayangonj General Hospital as junior Consultant. In the Department she was given the important task of further developing the anaesthesia department thereby improve the anaesthetic service.

She was an member of Bangladesh Society of Anaesthesiologist and took active part in different activities of the society.

Dr. Maya Shaha aged 52 years, a good soul left this world December 17, 2010 due to Carcinoma cervix.