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Contents

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f. Discussion
g. Acknowledgement (if any)
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INTRODUCTION

- The statement of the problem with a short discussion of its importance and significance
- Review of literature related to the problem with pertinent reference
- Objective, hypothesis benefits should be clearly stated

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- Research type, place, time and sample characteristics
- Description of outcome and factor variables
- Selection criteria
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- Description of procedure method as drugs or chemical as applicable
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Note

To the creative architect behind our scholarly publication Dr. Md. Nazrul Islam, designed the cover of the Journal of Patuakhali Medical College (JPkMC). His dedication to crafting a cover that translate concepts into visually stunning designs is a testament to his talent and expertise.

We extend our heartfelt gratitude for his unwavering commitment to excellence. His contribution enriches not just the visual appeal of our journal, but also adds depth and meaning to the content within.

With sincere appreciation,
Dr. Md. Zahirul Islam
Editor-in-Chief
Journal of Patuakhali Medical College

Editorial

Revolutionizing Healthcare: Robotics in Medicine

Md. Zahirul Isalm[1], Md. Moniruzzaman[2]

Robotics has revolutionized the healthcare industry in the twenty-first century, with traditional practices undergoing significant transformations across various medical domains. From operative techniques to diagnostic procedures and support for disabled patients, its impact has been profound and far-reaching. This transformation has been facilitated by the high precision of robots, heralding a new era in the healthcare system.

Three general areas of advanced robotics are identified: macro robotics, micro robotics and bio-robotics.[1] Mechanical works like wheel chair, patient manipulators for rehabilitation can be handled with macro robotics, micro robotics include micro instrumentation during surgery and bio-robotics used to understand the physiological processes.

Robotics can modify healthcare services across the entire spectrum of life, from before birth to afterlife, in various ways.[2] Examples of different robots are the da Vinci Robotic surgical system, Veebot for blood investigation, Hanako the robotic dental patient for dentist training, for patient care RP-7 robot ancd Robot for Interactive Body Assistance (RIBA).[2]

In the healthcare system, especially in the field of surgery, robotics has expanded its horizons. Robotics was integrated into surgery for its mechanical advantages, such as a degree of rotation that surpasses human capability. Miniature cameras, instrumentation, teleoperation, and access to difficult sites have been achieved with the help of modern robotic systems. The first surgical robot was developed by Intuitive Surgical and was named da Vinci, in honor of Leonardo da Vinci.[3] It has a console that controls the articulated arms.

Some forms of artificial intelligence (AI) can help in disease diagnosis by analyzing medical images. In cases of early diseases, there might be human errors in detecting subtle changes where AI-driven analysis has enhanced precisions. In the diagnostic field image guided procedures and navigation systems have significantly changed with the help of robots. Blending the image guided navigation systems along with advanced surgical techniques with high precision has improved the patient care and has enhanced recovery rates.

Robots are serving as assistants in several medical fields as they have improved their social skills and reliability.[4] In diagnostic field blood collection has been automated with Veebot.[2] This robot utilizes an infrared light to identify a vein and uses ultrasound to analyze blood flow. After confirmation, needle is inserted to draw venous blood with 83% accuracy.[5]

In rehabilitation, robotics helps in movement of disabled patients. These devices are equipped with sensors and intelligent control systems. Some robots can be controlled with voice command but sometimes modifications are needed for some special conditions like dysarthria. Recent advances have made this possible.[6] Robots can be used beyond medical care,

1. Dr. Md. Zahirul Islam, Assistant Professor (ENT), Patuakhali Medical College, Patuakhali, Bangladesh.
2. Professor Dr. Md. Moniruzzaman , Principal, Patuakhali Medical College, Patuakhali, Bangladesh.

Correspondence: Dr. Md. Zahirul Islam, Assistant Professor (ENT), Patuakhali Medical College, Patuakhali, Bangladesh, email: xaheer33@yahoo.com

including dispensing medicine, sterilization, and even patient companionship.

Challenges regarding the use of robot include high cost, public misconceptions, ethical issues and regulations. These challenges can be overcome with comprehensive training. Awareness among the healthcare professionals regarding advances in technology can shift the paradigm toward the new era of robotics and AI.

There are some misconceptions about robots and artificial intelligence seen among the public.[7] These misconceptions are fueled by some media and lack of understanding. However, with proper policy implementation and education initiatives, can address this issue. Clear communication about the capabilities and limitations of robotics and AI is essential for fostering informed public discourse.

With thoughtful regulation, investment in education, and interdisciplinary collaboration, this revolution will reform the future healthcare system to be more efficient and effective than ever before.

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Review Article

Universal Neonatal Hearing Screening: A Comprehensive Review

Md. Zahirul Isalm[1], Mst. Munira Akter Khanam[2]

ABSTRACT

Universal neonatal hearing screening test is routine test of newborn to detect hearing impairments in early stage of life. Early detection and early intervention is necessary for expected linguistic and literacy outcome. In this paper we reviewed the current state of knowledge regarding transient evoked otoacoustic emission and automated brainstem response. These tools are used as screening tools for neonatal hearing screening program. Universal newborn hearing screening is widely used than only risk factor screening. Some improvements of these tools such as automation, portability and AI integration have enhanced this program.

Keywords: Auditory Evoked Potentials, Otoacoustic Emissions, Universal Screening, Auditory Brainstem Response, Early Intervention

INTRODUCTION

Neonates are the newborn babies of below 4 weeks of age.[1] Screening involves testing asymptomatic populations to evaluate the probability of having a particular disease.[2] Neonatal screening refers to tests performed within the neonatal period. This screening is essential for early detection of congenital conditions that may not be immediately apparent, allowing for timely intervention and treatment. From metabolic disorders to hearing impairment, neonatal screening plays a crucial role in ensuring the well-being of newborns. Among thousand newborns, 1-3 are found to be suffering from severe bilateral hearing impairment.[3] This significant number of newborns demands the early screening and intervention measures to address hearing-related challenges.

Hearing impairment is defined when hearing threshold is 40dB or greater.[4] During the neonatal period hearing screening is performed for early detection of permanent childhood hearing impairment (PCHI). Early detection is necessary for the deaf child to maximize the linguistic competence and literacy development through early intervention, as normal hearing is essential for speech and language development. However, hearing impairment in early childhood is often not diagnosed until later stages, creating a challenge hence termed as hidden disability.[5] According to the joint committee on infant hearing, hearing impairment detection should be done before 3 months of age, with intervention initiated within 6 months of age.[6,7]

Screening Methods

Neonatal hearing screening method uses otoacoustic emissions (OAE) and auditory brainstem response (ABR) as screening tools. In fact, OAE is used as a screening tool and ABR is reserved only for high risk babies and ones who could not pass OAE, as ABR is costly and requirs more expertise to perform.[8] These instruments are highly sophisticated, and they undergo regular updates and enhancements. Technological advancements have revolutionized these tools like automated auditory brainstem response (aABR) devices, enhanced otoacoustic emissions (OAE) equipment.

There are two methods for screening of bilateral PCHI: risk factor screening and universal newborn hearing screening

1. Dr. Md. Zahirul Islam, Assistant Professor (ENT), Patuakhali Medical College, Patuakhali, Bangladesh.
2. . Dr. Mst. Munira Akter Khanam, Lecturer, Department of Biochemistry, Patuakhali Medical college, Patuakhali.
Correspondence: Dr. Md. Zahirul Islam, Assistant Professor (ENT), Patuakhali Medical College, Patuakhali, Bangladesh, email: xaheer33@yahoo.com

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(UNHS).[9] Universal hearing screening means screening the all newborn babies, regardless of risk factors. Risk factors includes an admission to a neonatal intensive care unit, low birth weight prematurity, septicemia, hyperbilirubinemia, hypoxia, family history of deafness.[10,11] Universal hearing screening includes otoacoustic emissions (OAE), auditory brainstem responses (ABR).[12]

OtoAcoustic Emissions (OAE)

Outer hair cells have some active processes that produce some energy within the cochlea. These energy then transmit through middle ear into the external auditory canal which is known as otoacoustic emissions. This emissions can be recorded within the external ear canal which is a normal function of hearing. When there is absence of otoacoustic emission it indicates a loss of hearing greater than 40 dB.[14] This principle is used in neonatal hearing screening program. OAE testing is used as it is quick, simple to perform, non-invasive and can identify even mild hearing impairment. Its disadvantage is that it does not detect subtle losses such as mild losses (<35 dB) or auditory neuropathy spectrum disorder.[15] In universal neonatal hearing screening program, the OAE is used to obtain either a pass or refer test result. When a pass result is obtained, the likelihood of significant hearing loss is minimal. And when refer is obtained then it cannot be said that baby has a hearing impairment, thus no conclusions can be made. For the clarification of refer further investigations are needed. There are two types of OAE- One type of OAEs, distortion product OAEs (DPOAEs), studies passive versus active processing to identify auditory function. Transient evoked OAEs (TEOAEs) are a second type of OAE. TEOAEs are stimulated by transient clicks and are often faster and more tolerant to noise and movement than DPOAEs.[14] There are many similarities and dissimilarities between the DPOAE and TEOAE. DPOAE shows better performance above 4 kHz, whereas TEOAE performs more effectively between 0.5 to 1.5 kHz. This is more useful in diagnostic assessment rather than as a screening tool. Another thing is that TEOAE is faster than DPOAE. But recent DPOAE machine is faster than the older versions. DPOAE can perform better in noisy environments while TEOAE needs a quiet environment. Despite their differences, both types of OAEs contribute to comprehensive neonatal hearing screening programs.

In Transient Evoked Otoacoustic Emission (TEOAE), a probe is inserted into the external canal of new-born to detect hearing losses. A click stimuli of 75–85 dB is used and response is recorded. If the response wave have an acceptable amplitude in the defined spectrum then it is considered as the pass.[16] Otherwise it is considered as referred. The newborn babies usually examined after meal and in a quiet nursery room.

Auditory Brainstem Responses (ABR)

ABR is used simple stimuli such as clicks and sinusoids to tap into and maximize these transient and sustained auditory brainstem responses. While clicks and tones have been instrumental in defining these basic response patterns, they are poor approximations of the behaviorally relevant sounds we encounter outside the laboratory.[17] Advantages of the automated system include a dual artifact rejection system, attenuating ear couplers, and a battery operated design. These findings suggest that the automated ABR screener is a viable alternative to conventional ABR instrumentation for the limited purpose of neonatal auditory screening.[18] When auditory system is evoked with sound

stimulus it produces electrical responses into the brain. These electrical responses from the brainstem is recorded with surface electrode and present with time in graphs. The recorded responses have seven positive waves. Latency of these waves along with the amplitude is used for monitoring the Auditory Brainstem Response (ABR). In ABR thousands of nerve stimulations are averaged and summated. The ABR is used for estimation of hearing threshold and sometimes monitoring of brain functions in trauma and skull base surgery. ABR has seven positive waves. The latencies and amplitudes are the measures of these waves used clinically. These measurements can be done full automated form in automated ABR (aABR).[19,20,21]

Physiology of Newborn Hearing

Hearing starts in the external ear. The pinna and ear canal receives the longitudinal sound wave and direct these waves to the eardrum which vibrate the eardrum. The vibrations are then transmitted through the osscicular system of the middle ear to the fluid-filled inner ear.[22] In the inner ear the cochlea has specialized hair cells, which convert these vibrations into electrical signals. These signals are then transmitted via the auditory nerve to the brainstem and further to the auditory cortex in the brain. The brain processes these signal. During twenty fifth week of gestation, the fetus begins to respond to sound stimuli from the external environment. As the pregnancy progresses, the auditory structures, including the cochlea and auditory nerve, continue to mature, laying the foundation for auditory processing post-birth. Following birth, the auditory system enters a critical phase of development. Within the first few months, the infant's brain undergoes significant changes in response to auditory stimuli. This period, often referred to as the critical or sensitive period, is when the neural pathways responsible for processing and interpreting auditory information are being established and refined. Key milestones during this phase include the development of sound localization, discrimination of speech sounds, and the ability to differentiate between various pitches and frequencies. These milestones are crucial for language acquisition and overall cognitive development. There are some studies to address the effects of neonatal intensive care unit on hearing. High sound pressure levels in noisy hospital environment has shown in their physiological or functional changes.[23]

Neural Plasticity and Early Interventions

Early childhood intervention is essential due to the observed plasticity in neurons, presenting a window of opportunity for modifying neural functions. Processes like synaptogenesis, myelination, and the development of specific brain structures, including the medial temporal lobe and prefrontal cortex, have limited capacity during brain maturation. However, beyond a critical time period, changes occur within these processes, such as reduced synaptic activity modification ability. Neural plasticity manifests through time-bound axonal regeneration, dendritic surface expansion, alterations in neurotransmitter synthesis and post-synaptic responses, as well as changes in cortical and subcortical metabolic activities such as glucose utilization.[24] Neural plasticity can explain the neurophysiological basis of early childhood intervention, especially concerning the motor responses of the brain. Various physiological events unfold in response to experience, with linguistic development dependent on auditory experiences, and the critical period

of neural plasticity being crucial for such development.[24] Intervention tools for hearing-impaired children, such as hearing aid fitting, cochlear implantation, and audio-verbal therapies, play significant roles in this process. Early intervention facilitates the development of language skills essential for communication, as neural plasticity is most pronounced during early developmental stages.

Challenges in Screening Programs

Implementing universal screening programs in different country faces different challenges. Lack of human resources, inadequate infrastructure, equipment-related shortcomings, and low priority for hearing impairment (HI) prevention are seen in developing conunties.[25] Addressing these challenges requires a multifaceted approach. Portable machine, user-friendly, and cost-effective devices and integration of artificial intelligence may further improve the accuracy and efficiency of screenings. The implementation of hearing screening should be incorporated into the national healthcare policy.

CONCLUSION

Neonatal hearing screening is a very helpful tool for the early diagnosis of childhood permanent hearing loss. In this review, we have explored hearing screening tools such as OAE and ABR, which aid in early intervention. Early intervention contributes to better outcomes in linguistic and speech development.

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Original Article

Esmolol Hydrochloride and Dexmedetomidine on Pressure Response during Laryngoscopy, Intubation and Pneumoperitoneum in Laparoscopic Surgery

A.K.M Fakhrul Alam[1], Md. Mahbub-Ur-Rahman[2], Md. Nazmul Ahsan[3], Kaneez Fatema[4], Md. Salim Matber[5]

ABSTRACT

Background: Laparoscopy procedures require pneumoperitoneum for adequate visualisation and operative manipulations which affects many homeostatic systems causing alterations in acid-base status, cardiovascular system, stress response and pulmonary physiology. This study was conducted **t**o compare the effect of esmolol and dexmedetomidine on pressure response during laryngoscopy, intubation and pneumoperitoneum in laparoscopic surgery.

Methods: This was a randomized open labelled, prospective control type of study was conducted at Anaesthesia, Analgesia & ICU Department, Sher-e-Bangla Medical College Hospital, Barishal, Bangladesh from July 2020 to December 2020. Eighty Four patients aged between 25-60 years, belonging to ASA I or II of either sex posted for elective laparoscopic surgery under general anaesthesia were selected for the study. Patients were allocated randomly in to three groups (28 patients in each group).Patients of group-A received dexmedetomidine (0.5 mcg/kg) IV as loading dose over 10min, followed by 0.4mcg/kg/hr till the end of pneumoperitoneum and patients of group-B received esmolol (0.5mg/kg) IV as loading dose over 5 min followed by 50mcg/kg/min till the end of pneumoperitoneum. Patients of group-C received same volume of normal saline. During laryngoscopy, intubation, pneumoperitoneum, at reversal and extubation HR, MAP, oxygen saturation were observed. Recovery in terms of time to respond to oral-commands, extubation and full orientation was noted along with any adverse effects.

Results: In control group, there was significant increase in HR and MAP during intubation, extubation and pneumoperitoneum. In dexmedetomidine group we observed better control of HR and MAP as compare to esmolol and control groups.

Conclusion: Both dexmedetomidine hydrochloride and esmolol hydrochloride were effective in attenuating pressure response to laryngoscopy, intubation and pneumoperitoneum in patients undergoing laparoscopic surgeries. Dexmedetomidine was more effective to control HR and MAP as compared to esmolol. With dexmedetomidine, the recovery from anaesthesia was prolonged than esmolol.

Key words: Laryngoscopy, Laparoscopic Surgery, Pneumoperitoneum, Hemodynamic Response, Dexmedetomidine, Esmolol.

INTRODUCTION

Laparoscopy procedures require pneumoperitoneum for adequate visualisation and operative manipulations which affects many homeostatic systems causing alterations in acid-base status, cardiovascular system, stress response and pulmonary physiology. Laparoscopic procedures include smaller incisions, lower risk of wound complications, reduced postoperative pain and pulmonary complications, shorter hospital stay, more

1. Dr. A.K.M Fakhrul Alam, Assistant Professor, Anaesthesia, Analgesia & ICU Department, Patuakhali Medical College, Patuakhali, Bangladesh
2. Dr. Md. Mahbub-Ur-Rahman, Assistant Professor, Anaesthesia, Analgesia & ICU Department, Sher-e-Bangla Medical College, Barishal, Bangladesh
3. Dr. Md. Nazmul Ahsan, Assistant Professor, Anaesthesia, Analgesia & ICU Department, Sher-e-Bangla Medical College, Barishal, Bangladesh
4. Dr. Kaneez Fatema, Assistant Professor, Anaesthesia, Analgesia & ICU Department, Sher-e-Bangla Medical College Barishal, Bangladesh
5. Md. Salim Matber, Assistant Professor, Department of Ortho-surgery, Patuakhali Medical College, Patuakhali, Bangladesh

Correspondence: Dr. A.K.M Fakhrul Alam, Assistant Professor, Anaesthesia, Analgesia & ICU Department, Patuakhali Medical College, Patuakhali, Bangladesh, Email: alamf5940@gmail.com

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rapid return to normal activity which in turn reduces cost to the patient. These hemodynamic responses are mainly due to increased release of catecholamines, vasopressin, or both. Esmolol, an ultrashort-acting cardioselective β_1 adrenoceptor antagonist, has been used to control tachycardia and hypertension. They cause increase in systemic vascular resistance which increases mean arterial pressure, decreases cardiac output and compromise tissue perfusion. Various pharmacological agents like nitroglycerine[1], opioids[2], gabapentin[3], pregabalin[4], magnesium sulfate[5], clonidine[6], dexmedetomidine[7] and beta blocker[8] has been used to maintain hemodynamic during pneumoperitoneum. Dexmedetomidine by its agonist effect on α_2- adrenergic receptor thereby inhibiting the release of catecholamine and vasopressin released during laparoscopic surgery[9] controls hemodynamic response of pneumoperitoneum. Esmolol, an ultra-short acting cardio-selective β1- receptor antagonist, blunts hemodynamic responses to perioperative noxious stimuli during laryngoscopy, intubation and pneumoperitoneum.[8] Dexmedetomidine, an α_2 adrenergic receptor agonist, possesses hypnotic, sedative, anxiolytic, sympatholytic, and analgesic properties without producing significant respiratory depression.[10] Its sympatholytic effect decreases mean arterial pressure (MAP) and heart rate (HR) by reducing norepinephrine release.[11] Bhattacharjee *et al* [12] have shown that dexmedetomidine is effective in attenuating the adverse hemodynamic response to CO_2 pneumoperitoneum. Anaesthetic manoeuvres like direct laryngoscopy, tracheal intubation, extubation, pneumoperitoneum and CO2 insufflations necessary in laparoscopic surgeries causes increase in plasma stress hormone which leads to increase in heart rate (HR), mean arterial blood pressure (MAP), systemic and pulmonary vascular resistance and decrease cardiac output. In this randomized open labeled observer blinded study, we compared effect of esmolol and dexmedetomidine to attenuate pressure response to laryngoscopy, intubation and pneumoperitoneum during laparoscopic surgery. Our aim of study was to compare the effectof esmolol and dexmedetomidine on pressure response during laryngoscopy, intubation and pneumoperitoneum in laparoscopic surgery.

METHODS

This was a randomized open labelled, prospective control type of study conducted at Anaesthesia, Analgesia & ICU Department, Sher-e-Bangla Medical College Hospital, Barishal, Bangladesh from July to December 2020. Eighty Four patients aged between 25-60 years, belonging to ASA I or II of either sex posted for elective laparoscopic surgery under general anaesthesia were selected for the study. Patients who refuses or with history of hypertension, diabetes mellitus, morbid obesity, allergy to study drugs, renal and hepatic insufficiency, cardiopulmonary or respiratory disease, patients on beta blocker drugs, anticipated difficult intubation, pregnant or breast feeding female were excluded from the study. Patients were allocated randomly in to three groups (28 patients in each group).

Group-A: Inj. Dexmedetomidine hydrochloride.

Group-B: Inj. Esmolol hydrochloride.

Group-C: Inj. 0.9% normal saline was administered to the control group.

Pre-anaesthesia check-up was conducted and a detailed history and complete physical examination was done. Routine

investigations like complete blood count, random blood sugar, renal function test, liver function test, chest x-ray and electrocardiogram were done. Monitors for pulse oximetry, NIBP and multipara monitor. Baseline values of heart rate (HR), non-invasive blood pressure (NIBP) were recorded. Intravenous access was secured. All the patients were premedicated with intravenous Inj. glycopyrrolate 0.004 mg/kg, Inj. ondansetron 0.01 mg/kg, Inj. Omeprazole and antibiotic. Group-A: Inj. Dexmedetomidine hydrochloride intravenously (IV) bolus of 0.5 µg/kg was given over 10 minutes by infusion pump starting 5 minutes before induction following which infusion rate was set at 0.4 mcg/kg/hr till the end of pneumoperitoneum. Group-B: Inj. Esmolol hydrochloride IV bolus of 0.5 mg/kg was given over 5 minutes by infusion pump starting 2 minutes before induction, followed by infusion was set at 50 mcg/kg/min till the end of pneumoperitoneum. Group-C: 0.9% normal saline was given as bolus 3 ml/min starting 5 min before induction by infusion pump following which infusion was continued till the end of pneumoperitoneum.

The patients were pre oxygenated with 100% oxygen by face mask for 3 min. Anaesthesia was induced with intravenous Inj. fentanyl 2 mcg/kg, Inj. thiopentone 6mg/kg and Inj. Vecuronium 0.1mg/kg to facilitate intubation. Oro-tracheal intubation with Macintosh laryngoscope was done with an appropriate sized portex cuffed endotracheal tube. Intubation was done by experienced anaesthesiologist. Patients were maintained with oxygen, nitrous oxide (O2:N2O, 40:60), Halothen* 7 MAC and intermittent boluses of Inj. vecuronium (0.01 mg/kg). Patients were ventilated manually with tidal volume 500-550 ml/kg and respiratory rate 12–14 breaths/min. Intraabdominal pressure was maintained to 12-14 mm of Hg. CO2 insufflation flow was maintained at the rate of 6 L/min. HR, oxygen saturation (SpO2), urine output and blood loss was monitored. As soon as the pneumoperitoneum was released, study drug infusion was stopped. At the end of procedure, residual neuromuscular blockade was reversed with IV glycopyrrolate (.004mg/kg) and neostigmine (0.05 mg/kg). HR, MAP and SpO2 were recorded at baseline, after study drug administration, after induction, immediately after intubation, at the time of gas insufflation, at every 5 minute interval after pneumoperitoneum, at the end of pneumoperitoneum, at the time of reversal and at the time of extubation. Hypertension (MAP >110 mmHg) was treated with intermittent bolus of Inj. Propofol. Bradycardia (HR<50/min) was treated with inj. atropine 0.6mg IV. Any case of failure to intubate within 15 second, massive blood loss, laparoscopic surgery converted to open laparotomy and surgical time extended more than 3 hr was excluded from the study.

Statistical Analysis: Statistical analysis was carried out using the Graph pad prism 8.0 statistical software. Results of continuous measurements were presented as Mean±SD and results of categorical measurements are presented in number and percentage (%). Patient characteristic data were analysed with one-way analysis of variance (ANOVA) for continuous variables and Chi-square test for categorical variables. Inter group comparison of HR; MAP was done with ANOVA, followed by an unpaired t-test. A p-value of <0.05 was considered statistically significant.

RESULTS

Our study included 84 adult patients of ASA grade I and II posted for laparoscopic surgery. They were randomly assigned into three groups of 28 patients in each. None of the patient was excluded from the study. As shown in Table 1 there was no significant difference in age, sex, weight, duration and type of surgery (P value >0.05) in all groups. Table-2 shows, there was no significant difference in baseline HR between the groups. After administration of the study drugs and induction agent, there was a significant decrease in HR in group-B and group-C as compared to group-A ($p<0.05$).

Table 1: Demographic Data (N=84)

Variables	Group A Mean+ SD	Group B Mean+ SD	Group C Mean+ SD	P-value
Age (year)	52.2+9.06	49.26±10.34	48.8+10.43	0.30
Sex (Male/Female)	13/15	14/14	13/15	
Weight (kg)	54.66±7.89	52.86±9.58	53.71±8.83	0.67
Duration of surgery(min)	147.33±36.69	144±41.11	150.4+31.73	0.79

Table-2: Comparison of heart rate at various time intervals (N=84)

	Group A	Group B	Group C	P value
Baseline	88.4±8.6	89.32±6.8	87.22±6.4	0.69
After intubation	100.4±10.6	102.4±11.2	103.32+12.6	0.70
Before pneumo-peritoneum (PP)	97.6±10.8	98.6±11.24	96.8±9.4	0.83
5 min after PP	95.4±8.4*	96.2±8.6*	106.42±10.6	0.0005
15 min after PP	96.6±11.6*	94.4±10.6*	108±12.6	0.0005
30 min after PP	94.6±10.6*	93.6±9.6*	106.4±11.6	0.0003
60 min after PP	95.6±9.6*	94.6±11.4*	108.24±12.6	0.0003
After release of PP	90.4±9.2**	89.32+8.4*	101.8±11.4	0.0003
After extubation	94.8±10.36*	92.8±9.4**	104.6±10.6	0.0008

Gas insufflation caused an increase in HR from baseline values in group-C, however this increase was not seen in group-B and group-A ($P<0.001$). In group-C, HR was maintained near baseline values and below baseline value in group-B. However HR was statistically lower in group-A ($p<0.05$). In group-A there was significant rise from baseline value in the HR immediately after intubation and remained higher till the end of pneumoperitoneum. In group-B, after loading dose HR was decrease from baseline value and remained decreased at all-time intervals till the end of surgery. In group-C, there was minimal increase in HR from baseline value immediately after intubation which came to baseline values within 3 min after intubation and remained near baseline values till the end of pneumoperitoneum.

Table-3: Comparison of mean arterial blood pressure at various time intervals (N=84)

	Group A	Group B	Group C	P value
Baseline	80.2+6.3	81.2+4.2	81.34±4.6	0.77
After intubation	97.6±10.44	98.2+9.6	100.2±1 1.6	0.78
Before pneumo-peritoneum (PP)	86.6±9.4	87.2±8.6	88.4±8.8	0.92
5 min after PP	78.2±8.8*	80.4±6.8*	93.4±1 1.4	0.0001
15 min after PP	80.4±10.4*	79.2±8.2*	94.8±1 1.6	0.0001
30 min after PP	81.6±9.4*	79.6±7.2**	96.8±10.4	0.0001
60 min after PP	81.4±9.4*	79.6±7.2*	96.8±10.4	0.0013
After release of PP	79.4±9.6*	81.4±8.6*	90.2±10.4	0.0001
After extubation	85.2±10.4*	84.4±9.6*	98.84±1 1.6	0.69

Table-3 shows, there was no statistically significant difference in baseline MAP between the groups but after administration of the study drugs and induction agent, significant decrease was seen in MAP in group-A, while no significant difference between group-A and group-B (P>0.05) was found. The rise in MAP immediately after intubation was 25% in group-A and 15% in group-B. Gas insufflation caused an increase in MAP from baseline values in group-A, it was not seen in group-A and group-C (P<0.001). There was significant difference in MAP values between all the groups during pneumoperitoneum (p<0.001). During pneumoperitoneum MAP was higher in group-A at all-time intervals as compared to baseline values. Where as in group-A, MAP was maintained near baseline values, while it was below baseline value in group-C. There was no significant difference in MAP values between group-A and group-C at the end of gas insufflation, at the time of reversal and at the time of extubation (P>0.05), however MAP was statistically lower in group-A (P<0.05). While comparing group-A and group-C, there was significant difference between the groups in MAP at all-time interval during pneumoperitoneum (P<0.001). In group-A and group-B, statistically significant increase in MAP after intubation and during pneumoperitoneum was observed. Decrease in MAP was found in group-A after administration of dexmedetomidine, which was persisted till the end of surgery and extubation.

Table-4: Post-operative complications

Post-operative complication	Group A	Group B	Group C
Nausea	1	2	3
Vomiting	1	3	4
Respiratory Depression	1	-	-
Bradycardia	5	3	-
Hypotension	4	1	-

Table-4 shows bradycardia was found in 5 patients of group-A and 3 patients in group-B which responded to inj. atropine (0.6mg) IV stat. Hypotension was found in 4 patients of group-A and 1 patient of group-B. Respiratory depression was found in 1 patient of group-A.

As shown in table-5, time to respond to oral commands was longer in dexmedetomidine (8.5±1.3 min) as compared to esmolol group (5.8±0.99 min) and control group (5.7±0.97 min) which is statistically Significant (P<0.001).

Table-5: Recovery profile.

Recovery Profile	Group A	Group B	Group C
Time to respond to oral-commands (min)	11	12	14
Time to extubation (min)	9	8	8
Time to full orientation (min)	8	8	6

There was no significant difference in time to respond to oral commands between esmolol group and control group (P>0.05). The time to extubation was longer in dexmedetomidine group (11±1.86 min) as compared to esmolol group (8.7±1.4 min.) and control group (8±1.03 min) which is statistically significant (P<0.01). There was no significant difference in time to extubation between esmolol group and control group in our study. Time to full orientation was longer in dexmedetomidine (14.03±2.78min) as compared to esmolol group (10.43±1.45min) and control group (10.2±1.32min) which is statistically significant (P<0.001). There was no significant difference in time to full orientation between esmolol group and control group (P>0.05). In group-A decrease in respiratory rate (RR) 10/min and tidal volume (300 ml) was found in one patient. Patient was observed in operation theatre, RR was improved to 14/min and tidal volume to 500 ml within 30 min.

DISCUSSION

For laparoscopic procedures, CO2 is used to create pneumoperitoneum because of which intra-abdominal pressure increases, which causes stretching and stimulation of peritoneum by CO2 which leads to activation of sympathetic nervous system which in turn increases plasma catecholamine and vasopressin level, which further activates renin angiotensin aldosterone system leading to abrupt increase in HR, MAP, cardiac output and systemic vascular resistance.[13] Administration of general anaesthesia, laryngoscopy, tracheal intubation and extubation are one of the critical events which lead to transient yet marked sympathoadrenal response leading to hypertension and tachycardia.[14] This can leads to complications like myocardial ischemia, infarction, etc. Bon Sebastian et al[15] conducted study for an optimal bolus dose of dexmedetomidine by comparing two doses 0.5mcg/kg and 0.75 mcg/kg with placebo to attenuate stress response during laryngoscopy and endotracheal intubation and found that both the doses were effective in attenuating the pressure response. If dexmedetomidine given as rapid infusion, it leads to a biphasic response on blood pressure which is initial hypertension followed by fall in blood pressure due to stimulation of α2 receptors in vascular smooth muscles.[16] In our study, we choose lower dose 0.5 µg/kg and administered slowly as an infusion over 10 min as bolus and found it effective to control pressure response during laryngoscopy and intubation as compared to control group. Siddareddigari Reddy et al.[17] compared dexmedetomidine (1mcg/kg) and esmolol (2mg/kg) for attenuating hemodynamic response and found esmolol effectively control HR after intubation but no effect on

systolic blood pressure whereas, dexmedetomidine suppressed both HR as well as MAP to laryngoscopy and tracheal intubation. In our study, we found that both the drugs blunted HR response to laryngoscopy and intubation significantly (P<0.001). We used low dose dexmedetomidine infusion (0.4mcg/kg/hr) and found it effective to control the hemodynamic changes due to pneumoperitoneum during laparoscopic surgeries. Similar to our study, Gourishankar Reddy et al.[18] studied dexmedetomidine (0.4mcg/kg/hr) infusion for hemodynamic stability and found it effective in attenuating hemodynamic stability. Decrease in MAP was significant only at higher dose. In our study, bolus dose of 0.5mg/kg esmolol significantly blunted rise in HR but did not blunted blood pressure response. The rise in HR during intubation was 4% inesmolol group whereas; the rise in blood pressure during intubation was 14% in esmolol group. Similar to this, A. M. Koivusalo et al.[8] studied effects of esmolol (1mg/kg bolus followed by 200 mcg/kg/min infusion) on hemodynamic response to CO2 pneumoperitoneum for laparoscopic surgery. They concluded that esmolol effectively prevent the pressure response to induction and maintenance of CO2 pneumoperitoneum. In our study, we found effective control of HR and MAP throughout the pneumoperitoneum with esmolol 0.5mg/kg bolus followed by 50mcg/kg/min infusion as compared to control group without intra-operative complication. Effect on HR was faster while control of MAP was delayed, which may be related to the gradual decline in the plasma renin activity occurring with a half- life of 11.9 minutes. Ahmed nabil ibrahim et al.[19] compared the efficacy of clonidine (2mcg/kg bolus) versus esmolol (1.5mg/kg bolus followed by 10 mcg/kg/min infusion) on the hemodynamic response during laparoscopic cholecystectomy and concluded that esmolol and clonidine both provided hemodynamic stability in laparoscopic cholecystectomy but clonidine was associated with postoperative sedation. We compared esmolol with dexmedetomidine and found more sedation in dexmedetomidine group with better control of hemodynamic response to laryngoscopy, intubation and pneumoperitoneum. In accordance to our study, Nirav kotak et al.[20] also compared dexmedetomidine and esmolol in similar dose for attenuation of pressure response during pneumoperitoneum in patients undergoing laparoscopic cholecystectomy. However, MAP was not significantly controlled during intubation but values were lower compared to control group. Study done by Vinit K. Srivastava et al.[21] with dexmedetomidine (bolus dose of 1mcg/kg followed by 0.5mcg/kg/h infusion) and esmolol (bolus dose of 1mg/kg followed by 0.5mg/kg/h infusion) during laparoscopic cholecystectomy also showed dexmedetomidine is better than esmolol for attenuation of hemodynamic response to pneumoperitoneum. Kol et al.[22] studied desflurane with esmolol or dexmedetomidine for controlled hypotension during tympanoplasty. They found significantly shorter extubation and recovery times and significantly less postoperative sedation in esmolol group as compare to dexmedetomidine. In accordance to our study Ibraheim et al.[23] compared esmolol and dexmedetomidine in similar dose and found dexmedetomidine was associated with prolonged recovery as compared to control group. In consistent to above studies we also found prolong recovery time with dexmedetomidine as compared to control and esmolol group. The

study by Islam M. Massad et al.[24] and Necla Dereli et al.[25] demonstrated less postoperative nausea and vomiting with dexmedetomidine and esmolol infusion during laparoscopic surgery respectively. Similarly we also found less incidence of nausea and vomiting with both dexmedetomidine and esmolol group as compared to control group.

CONCLUSION

In concluded, both dexmedetomidine hydrochloride and esmolol hydrochloride were effective in attenuating pressure response to laryngoscopy, intubation and pneumoperitoneum in patients undergoing laparoscopic surgeries. Dexmedetomidine was more effective to control HR and MAP as compared to esmolol. With dexmedetomidine, the recovery from anaesthesia was prolonged than esmolol.

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Original Article

Intracaesarean Intrauterine Contraceptive Device: A Window of Opportunity for Unmet Need

Rezowana Afrin[1], Md Sazzad Hosen Romel[2]

ABSTRACT

Background: Among the various contraceptive devices, Intrauterine Contraceptive Device (IUCD) is one of the safest method during post-partum period is also known as post-placental IUCD (PPIUCD). Due to fear it is not used as much as expected. Therefore, to evaluate the outcome of IUCD insertion during caesarean section was the objective of the study.

Methods: This hospital based prospective study and was conducted at the inpatient department of Obstetrics and Gynecology in Sir Salimullah Medical College (SSMC) and Mitford Hospital (MH). For this study, data was collected form total 150 women by the investigators. Collected data was analysed by computer with the help of SPSS 16.

Results: More than half of the women (57.3%) were aged between 20-25 years. About 65% resides in rural area. Most of them had an education level below higher secondary (85%). Among them about one third (35.4%) patients were gravid for the 2nd time, and about one third (31.3%) patients were 3rd time. Majority of the women (n=83, 55.3%) were comfortable with PPIUCD at 6 weeks follow up and no expulsion was reported at time. At 3 months follow up, 81.3% women did not report any complications and thread was not found in 65 patients. Total 5.33% women removed IUCD. Eighty six percent were happy with PPIUCD as a method of contraception.

Conclusion: It can be concluded that overall Intracaesarean IUCD insertion appears safe and effective.

Key words: Intrauterine Contraceptive Device, Caesarean Section, Contraception, IUCD

INTRODUCTION

Post-partum period is very vulnerable for mother and they do not desire a pregnancy at this period. The women undergoing caesarean section need effective long-term contraception. An estimated 12% of sexually active Bangladeshi women are identified as having an unmet need for family planning.[1] This means they express a desire to either limit or space future births but are not currently utilizing any family planning methods. During the post-partum period women are clearly non pregnant and highly motivated to initiate long acting contraceptive method. Intra Uterine Contraceptive Device (IUCD) is the most widely used reversible form of contraception, with 100 million estimated users worldwide.[2] Post-placental IUCD (PPIUCD) should be inserted only after counseling the woman, preferably during the antenatal period or in early labor. The insertion of PPIUCD can occur during a cesarean delivery, following the removal of the placenta and before closing the uterine incision. Insertion should be conducted either manually or with the aid of a long instrument, such as placental forceps, to ensure that the IUCD is positioned at the fundus, as high as possible, to minimize the risk of expulsion.[3] In comparison to other contraceptive methods, early postpartum IUCD insertion offers numerous advantages. It offers immediate contraception without disrupting breastfeeding and may help avoid discomfort associated with insertion. Inserting an IUCD immediately after placental removal has not been linked to increased infection, uterine perforation, postpartum bleeding, or uterine subinvolution.[4] In a Cochrane Collaboration review comprising nine randomized controlled trials (RCTs) evaluating the

1. Dr. Rezowana Afrin, Medical officer (OPD), Shaheed Suhrawardy Medical College Hospital, Dhaka,
2. Dr Md Sazzad Hosen Romel, Asst Professor, Department of Medicine, Shahabuddin Medical College & Hospital, Dhaka.

Correspondence: Dr. Rezowana Afrin, Medical officer (OPD), Shaheed Suhrawardy Medical College Hospital, Dhaka, Cell no – 01717155990 ; email : rez2tanya@gmail.com

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viability of immediate PPIUCD insertion, it was revealed that the procedure was safe and effective. However, expulsion rates were observed to be higher for immediate postpartum insertion compared to interval insertion. Consequently, women undergoing immediate postpartum insertion require early follow-up appointments along with self-examinations to check for the presence of the strings and detect any spontaneous expulsions.[5] However, the benefits of offering highly effective contraception immediately after delivery outweigh the disadvantages. This study was conducted to explore the potential outcomes of Copper-T380a insertion following a cesarean section.

METHODS

Prospective follow up study was conducted in Department of Obstetrics & Gynaecology of Sir Salimullah Medical College and Mitford Hospital, Dhaka from 1 July 2017 to 31 December 2017. All pregnant women at term, admitted for caesarean section to SSMC and MH during the study period were approached for the study. Our inclusion criteria were- 1) Delivery by caesarean section at term, 2) Women willing for Copper- T insertion and its follow up, 3) Women satisfying the WHO MEC criteria for postpartum IUCD insertion. And exclusion crireria were- 1) Prolonged rupture of membrane longer than18 hours, 2) Chorioamnionitis or puerperal sepsis, 3) Prolonged labour & obstructed labour, 4) Uterine abnormalities/fibroid, 5) Unresolved postpartum haemorrhage.

Total 352 women were approached for PPIUCD. Among them 150 women accepted PPIUCD. In all cases ethical issues was considered properly and following written informed consent all women were interviewed by a structured questionnaire. Follow up was done in two times at 6 weeks and at 3 months. During follow up clinical history and physical examination were focused about any complication, expulsion, visibility of strings, and any unusual phenomenon. Ultrasonogram was done whenever it was necessary. Following interview, physical examination and investigation (USG) data were collected by using a structured questionnaire. Monthly income of <5,500 taka was considered as below average, 5,500-11,500 taka as average and >11,500 taka as above average.

RESULTS

Acceptance rate 42.6%. About half of the participants (57.3%) had their age between 20-25 years. one third (31.3%) women had age in between 26 to 31 years and 11.4% women had age of more than 32 years. Majority came from rural area (65%), rest of the women were staying at urban area. Forty two percent of the patients had education up to secondary school level. Fifteen percent completed SSC, 30.7% studied up to primary level and 12% were illiterate. About half of the patients (55.3%) in this study had an average socio-economic condition.

Table 1. Practice of contraception before present pregnancy (n=150)

Methods used before	Frequency	Percent
No method	24	16
OCP	53	35
Emergency pill	08	5.4
Condom	17	11.4
Injection	27	18
Implant	07	4.8
IUCD	03	2
More than one method	11	7.4
Total	150	100

Twenty seven percent patients had come from below average income family and 17.4% patients had above average status. About two-third of the patients (71.3%) were housewives, rest were self-employed. Nineteen percent patients were primi gravida, 35.4% patients were gravid for the 2nd time, 31.3% patients were gravid for the 3rd time, 14% patients were gravid for the 4th time and above. Among the women only 18 had prior idea about PPIUCD insertion.
About one-third of the participants (35%) took OCP as method of contraception, 2% women used IUCD, and 16% women never used any method. Table 1 shows the details.

Table 2. Distribution of study population depending upon the reason for choosing PPIUCD (n=150)

Why interested in PPIUCD	Frequency	Percent
Safe	12	08
Long acting	37	24.7
Reversible	23	15.4
Don't need to remember	34	22.7
Doesn't interfere with breast feeding	13	8.6
No hormone-related side effect	09	06
Fewer routine clinic visit	17	11.3
Others	05	3.3
Total	150	100

Study sample was inquired about reason for choosing PPICUCD. About one-fourth women showed interest about PPIUCD due to its long acting action, another one-fourth due to convenience that there is no need to remember daily. See table 2.

Table 3: Complications/ Compliance of Intracaesarean IUCD insertion of patients followed up at 6 week.

Complications	Follow up at 6 week	Follow up at 3 months
No complication	83 (55.3)	122 (81%)
Excessive bleeding	21 (14%)	4 (2.7%)
Spotting	4 (2.7%)	3 (2%)
Pain	17 (11.3%)	7 (4.7%)
Infection	4 (2.7%)	1 (0.7%)
Expulsion	Nil	2 (1.3%)
Mucoid discharge	15(10%)	Nil
Uterine perforation	Nil	Nil
Pregnancy	Nil	Nil
Not followed up	6 (4%)	11 (27.6%)
Total	150 (100%)	150 (100%)

About half of the patients (55.3%) were comfortable with PPIUCD at 6 week's follow up and did not report any discomfort or complication. At 3 month's follow up, 81% women had no complication or complaint.

Table 4: Visibility of thread of Cu-T at follow-up at 6 week and 3 months

	At 6 weeks	At 3 months
Not seen	67(44.67%)	65(43.35%)
Seen	77(51.33%)	72 (48%)
Did not come for follow up	6 (4%)	11 (7.35%)
Expulsed previously	-	2 (1.3%)
Displaced previously	-	Nil
Total	150 (100%)	150 (100%)

There was two cases of expulsion. Seven women complained of pain and eleven women did not come to follow up. Table 3 describes in details about it.

On speculum examination at 6 week follow-up, thread was not seen in 67(44.67%) patients.These 67 patients, who were in the group of "thread-not seen" at 6 week, were advised to perform pelvic ultrasound scan. IUCD was found in-situ in 58 patients and nine patients did not undergo pelvic sonogram. At 3 month's follow-up, in 66 patients (43.35%) thread could not be seen on speculum examination and 2 woman had history of expulsed IUCD (Table 4).

All 65 patients, who were in the group of "thread- not seen" at 3 month, were advised to perform pelvic USG. IUCD was found in-situ in 63 patients and expulsion was confirmed in 2 patients.

Table 5: Expulsion rate of PPIUCD

Expulsion	After LUCS (n=150)
At 6 week	Nil
At 3 month	2 (1.3%)
Total	2 (1.3%)

Among 150 women, 2 women reported expulsion in the three month's follow-up period, that is expulsion rate of intracaesarean IUCD in this study is 1.3% which were confirmed at 3 month's follow-up by pelvic USG. Table 5 shows the expulsion rate.

Table 6 : Reason and rate of post placental IUCD removal

Excessive PV bleeding	4 (2.7%)
Pain in abdomen	3 (2%)
Infection	1 (.63%)
Total	8 (5.33%)

Among 150 patients, 8 (5.33%) removed IUCD for various reasons; among them P/V bleeding was the most common cause. Table 6 shows the details.

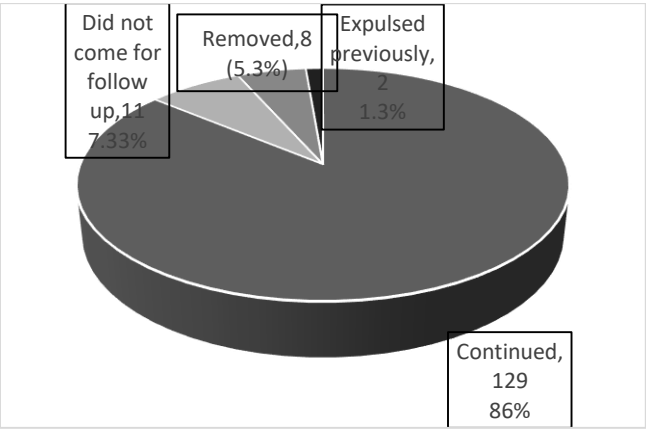

Figure 1. Continuation rate of intracaesarean IUCD (n=150)

This pie diagram shows that out of 150 cases followed up after 3 months, 130 were happy with intracaesarean IUCD as a long term method of contraception and continuation rate is 86%.

DISCUSSION

In our study total acceptance rate of PPIUCD was 42.6% where few years ago a large series in tertiary care hospital of India found total acceptance rate was 46.27%.[6] This is probably due to similar social and cultural background of two neighboring countries.

Acceptance rate varies between urban and rural women. Katheit G et al. also found that a little difference in acceptance rate of PPIUCD between rural (47.6%) and urban (52.4%) women.[7] This difference is noted as urban women have relatively easy access to other methods of contraception.

We have found about half of our participants were in between 20-25 years of age, that is very similar to study of Singh S et al.[6] and Katheit G et al.[7] This indicates that there is a

tendency to delay subsequent pregnancy in younger age group.

In present study, primi or multigravidas (4th gravida and onwards) showed less interest in PPIUCD. And interestingly, women having 2nd and 3rd gravida were more interested for PPIUCD. This may be due to the fact primiparas did not ready to accept PPIUCD as they didn't want long term interal (10years) for birth spacing. Multigravidas prefer permanent contraceptive methods. This findings is consistent with the studies conducted by Grimes D et al., Mishra S and Kumar S et al. where they found higher acceptance in multiparous clients (65.1%), (54.72%) and (53%) respectively.[5,8,9]

Oral combined contraceptive pill was the most widely used method into our participants. Very few heard about PPIUCD. Also women who knew about PPIUCD had many misconceptions and myths about it like it affects lactation, non-reversible method, cause pain and heavy bleeding, hinders during coitus etc. During the study these misconceptions were cleared up and women were educated, counselled and motivated about IUCD along with providing PPIUCD insertions.

Majority of the women in this study who accepted intracaesarean IUCD had education upto secondary school level. This is because most of the patients in govt. hospitals of our country are from below average economic condition, thus their literacy level was low. Similar study was done by Singh S et al.[6] The study showed that acceptance of PPIUCD was higher among women with primary and secondary school level (65.16%) than those with formal or higher education (18.36% and 16.46%). Mishra S also found that PPIUCD use was higher among women with primary and secondary education (28.56 % and 13.88), than those with no formal or higher education (7.75 and 8.21 %).[8] Another study done in Egypt where women with no formal education had an acceptance of 9.4 %, while those with formal education were 19.4 %.[10] This finding confirms education renders people more receptive to new ideas and practices of spacing methods, and importance of small family norms. Educational status plays a major role in fertility control in a population. Choudhary et al. found secondary and higher education influenced contraceptive use.[11]

About half of our participants had average family income. This is because our govt. hospitals provide free of cost medical services and the affluent peoples seek medical services mostly in private hospitals and clinics. In the study of Mishra S 64.72% and 30.82% were from below and average income group respectively.[8]

Mishra S showed in her study, most of the participants (49.29%) trusted their doctor's advice for accepting PPIUCD, 36.88% women agreed for no remembrance, 17.91% chose it for reversibility, 18.44% found it safe and 9.04% accepted it for being safe.[8] The findings of the present study are quite comparable to that study.

In the present study complications like pervaginal bleeding experienced by the patients were similar to the other studies of Singh Set al.[6] and Katheit G et al.[7] who reported 15.70% and 10.5% bleeding respectively.

Pain abdomen was reported in 11.3% patients. There is a vast difference in the percentage of patients reporting pain in various studies ranging from 43.8% to 8%. However, present study correlates with study by Katheit G et al who reported 12.9%.[7]

Irregular spotting was reported by 2.7% patients, mucoid vaginal discharge was found in 10% patients who were subsequently treated for vaginitis and 2.7% patients suffered from pelvic infection. There was no case of PPIUCD expulsion,uterine perforation or pregnancy.

During 3 month follow up, there were fewer number of complications (11.4%). Thread were not seen in 44.67% and 43.35% of cases at 6 week and 3 month follow up respectively. It poorly correlate with studies by Sudha CP et al. (23.3%)[12], Kittur S. et al (24.76%)[13], Gunjan Goswami (20%)[14] missing strings.

USG was advised for all the cases of missing IUCD strings and IUCD was found to be in situ in 58 and 63 patients at 6 week and 3 month follow up respectively and nine patients did not undergo pelvic ultrasonogram at 6 weeks follow up. Expulsion rate of intracaesarean IUCD in the present study was 1.3% during 3 months follow up which almost correlates with the study of Sudha CP. et al (3.33%)[12] and Kumar S. et al (4%)[9] but much lower than Singh S. et al (10.63%)[6]. Katheit G. et al (8%)[7] and Mishra S (8.99%)[8]. Tranceserean Insertion is known to have lower rates of expulsion at 1.2% compared to vaginal 9.6% in a study done in China by Chi IC et al.[4] Such low rate were reflected in our study having expulsion rate of 1.3%, whether this very high retention rate relates to the direct visual fundal placement by the surgeon or to the undilated cervix at the time of elective cesarean is unclear. It is to be mentioned here during insertion high fundal placement is an important step.[7] A Cochrane database of systematic reviews 2003 reports an expulsion rate of 2.4 to 5.2% by the end of first year.[5]

No cases of uterine perforation or pregnancy with IUCD-in-situ were reported during the study that is very similar to other studies.[15,16] The continuation rate in this study was 86% which matches with the study by Mishra S (81.11%)[8], Singh S. et al. (81.62%)[6] and Sudha CP. et al (88.3%)[12], but lower than Jamkhandi SS et al. (95%)[17] and higher than Katheit G. et al.(63.22%)[7].

CONCLUSION

Overall intracaesarean IUCD insertion appears safe and effective long-acting reversible contraceptive method. Intracaesarean intrauterine insertion of IUCD has no significant level of complication. And very few expulsion rate.

Limitation of the study

- This was a single centered study.
- Sample size was not big.
- Long time follow up was not considered
- Some patients had to be followed up on phone.

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Original Article

Audiological Evaluation of Otitis Media

Md. Zahirul Islam[1], Mst. Munira Akter Khanam[2], Md. Afzal Karim[3], Md. Wahiduzzaman[4]

ABSTRACT

Background: Hearing loss is the most frequent sequel of otitis media. Our aim is to assess the hearing thresholds in otitis media and to compare the hearing thresholds with non-diseased ears.

Methods: This is a cross sectional study. We performed pure tone audiometry in patients with otitis media and healthy individuals. Hearing loss was considered when the hearing thresholds were > 25 dB.

Results: Among our 110 patients diagnosed with otitis media (142 ears), 47.3% (52) were male and 52.7% (58) were female. The mean age was 45 years. Among them, 67 (61%) patients had mucosal COM; 04(3.6%) patients had cholesteatoma; 21 (19%) patients had OME and 18(16.3%) patients had AOM. Most patients (63%) had conductive hearing loss. About 35% of the patients had mixed hearing loss and 1.2% had pure sensorineural hearing loss.

Conclusion: Otitis media resulted in higher bone conduction threshold than non-diseased ears ($p < 0.01$).

Keywords: Otitis media, Hearing loss, Hearing threshold

INTRODUCTION

Inflammation in the middle ear cleft is known as otitis media. When inflammation persists more than three months, it known as chronic otitis media (COM). When discharge present, it is considered an active disease. The prevalence of COM was 4.1%, with 3.1% of individuals having unilateral disease and 1.0% having bilateral disease.[1]

When disease extends beyond the confines of the middle ear cleft, it is termed a complication of otitis media. These complications can be classified in different ways, such as by location in the intracranial spaces, chronicity, and degree of complexity. First-order complications result from direct or adjacent involvement of the infection, like mastoiditis, facial palsy in acute otitis media, labyrinthine fistula, and serous labyrinthitis. These complications typically have a clear presentation and diagnosis, can be treated with directed local measures within the temporal bone, and generally have a better prognosis. Second-order complications are the sequel of first order complications. And are more challenging to diagnose. Second-order complications may require a more urgent and specialized intervention.[2]

First-order complications have higher incidence and prevalence rates than second-order complications. Among these complications hearing loss requires special attention. A conductive type of hearing loss is common in otitis media due to effusion in tympanic cavity, perforation of the tympanic membrane or ossicular changes. Inflammatory processes in middle ear can also produce sensorineural hearing loss secondary to the inflammatory processes of the middle ear.[3] Otitis media may result in some degree of hearing loss. The aim of our study to compare the hearing thresholds in different forms of otitis media.

METHODS

This cross sectional study was performed in the outpatient deparment of Patuakhali Medical College Hospital and private consultation in Central Hospital Limited. We divided the patients into mucosal Chronic Otitis Media (mCOM), Cholesteatomatous,

1. Dr. Md. Zahirul Islam, Assistant Professor (ENT), Patuakhali Medical College, Patuakhali, Bangladesh.
2. Dr. Mst. Munira Akter Khanam, Lecturer (Biochemistry), Patuakhali Medical College, Patuakhali, Bangladesh.
3. Dr. Md. Afzal Karim, Assistant Professor (ENT), Patuakhali Medical College, Patuakhali, Bangladesh.
4. Dr. Md. Wahiduzzaman, Assistant Professor (Paediatrics), Patuakhali Medical College, Patuakhali, Bangladesh.

Correspondence: Dr. Md. Zahirul Islam, Assistant Professor (ENT), Patuakhali Medical College, Patuakhali, Bangladesh, email: xaheer33@yahoo.com

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Otitis Media with Effusion (OME) and Acute Otitis Media (AOM). Ears with otitis media were compared with ears of healthy individuals.

We included all patients with otitis media and patients over 18 years of age. And we excluded patients having a history of ear surgery, cancer, receiving chemotherapy or radiotherapy. A control group was selected who have bone conduction threshold<25 dB and no bone-air gap.

After proper history taking and clinical examination we performed pure tonal audiometry.. We considered hearing loss when the auditory thresholds were > 25 dB.

Statistical analysis was performed with spss. ANOVA and Spearman's correlation was used to correlate numerical variables. Values of $p < 0.05$ determined the statistical significance. The study was approved by the Ethical Review Committee of Patuakhali medical college and consent was taken from all the participants.

RESULTS

Following inclusion and exclusion criteria, we have found 110 patients and 142 ears in otitis media group. Thirty two (29%) patients were bilateral disease and 78(71%) patients were unilateral disease. Our control group had 65 patients and 130 ears, which were normal with no history of otitis media, hearing loss, ear surgery, and brain trauma.

In our 110 patients with otitis media, 58 (52.7%) were female and 52 (47.3%) were male. The control group consisted of 25 men (36.5%) and 40 women (63.5%). The ages of each group are described in Table 1.

Among our patients of otitis media, 67 (61%) had mucosal COM; 04(3.6%) patients had cholesteatoma; 21 (19%) patients had OME and 18(16.3%) patients had AOM. Regarding the number of ears, 80 ears had mucosal COM; 05 ears had cholesteatoma; 34 ears had OME and 23 ears had AOM. In addition to hearing loss most of the patients (69%) complained about tinnitus. Audiometric evaluation revealed that most patients (63%) had conductive hearing loss.

About 35% of the patients had mixed hearing loss and 1.2% had pure sensorineural hearing loss.

In the pure tone audiometry, we found worse bone thresholds in otitis media than the control in all frequencies ($p < 0.01$). (Table-3).

We also observed worse air thresholds in all ears with otitis media, when compared with the ears of the control group ($p < 0.001$), in all frequencies. (Table 4)

Table 1. Age of the patients

Age	Groups				
	mucosal Chronic Otitis Media (mCOM)	Cholesteatoma	Otitis Media with Effusion (OME)	Acute Otitis Media (AOM)	Control Gropup
Range	18–75	18–60	18–78	30–70	18–68
Mean	42	40	45	53	48

Table 2 Number of cases in different the types of hearing loss in each group.

Groups	Types of hearing loss in each group of otitis media			
	Conductive	**Mixed**	**SNHL**	**Total ears**
mucosal COM	60	20	0	80
Cholesteatoma	0	5	0	5
OME	18	16	0	34
AOM	12	10	2	23
Total	90(63.4%)	50(35.2%)	2(1.4%)	142(100%)

Table 3 Bone conduction thresholds in dB

Groups	Threshold in dB in different Frequencies			
	500Hz	1000Hz	2000Hz	4000HZ
mucosal COM	15dB	20dB	20dB	20dB
Cholesteatoma	20dB	25dB	30dB	30dB
OME	10dB	15dB	10dB	15dB
AOM	20dB	20dB	25dB	25dB
Control	5dB	5dB	10dB	5dB

Table 4 Air conduction thresholds

Groups	Threshold in dB in different Frequencies				
	500Hz	1000Hz	2000Hz	4000Hz	8000Hz
mucosal COM	30dB	35dB	35dB	40dB	45dB
Cholesteatoma	40dB	45dB	50dB	60dB	50dB
OME	35dB	40dB	35dB	40dB	40dB
AOM	35dB	40dB	45dB	45dB	40dB
Control	15dB	10dB	10dB	15dB	10dB

DISCUSSION

In our study we have found that in the diseased ear have higher bone and air conduction threshold compared to the control ear. Inflammation in the middle ear in otitis media alter the normal physiological environment. We have found all types of hearing losses conductive, mixed and sensory neural in our study. Sensory neural component is obvious when disease process involve cochlea. Inflammatory process pass beyond the middle ear boundary if it had a long course. We have found two pure sensory neural hearing losses in AOM group. Toxins in acute cases can invade round window membrane and enters directly into the cochlea causes such type of phenomenon.[5] We have a higher bone conduction threshold in OME. It may happen due to temporary threshold shift.[6]

In this study we have included only adult individuals. Pediatric patients may have

different pictures. As Children had greater variability in hearing loss the degree of asymmetry at each frequency compared to adults.[7,8] In our study we have found differences in bone conduction threshold. This may have many reasons such as ear canal pressure change. In a study it is found that the ear canal sound pressure has contribution in the mid-frequency hearing because of ear canal resonance.[9]

CONCLUSION

Findings of our study suggests that individuals with otitis media exhibit higher bone conduction thresholds compared to the control group. Further research into the mechanisms underlying this association may provide valuable insights.

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Case Report

Scar Ectopic Pregnancy: A Case Report

Mst. Munira Akter Khanam[1], Md. Faisal[2]

ABSTRACT

In this case report, we present a case of scar ectopic pregnancy in a 35-year-old woman with two prior cesarean sections. The patient presented with no expulsion or vaginal bleeding after taking abortifacient drugs 1 week ago following amenorrhea for 8 weeks. During Manual Vacuum Aspiration (MVA), blood was observed sprouting through the cervical canal. Subsequently, laparotomy was performed, and the product of conception was removed from the scar.

Key word: Cesarean Scar Ectopic, Scar Implantation, Uterine Scar Pregnancy, Scar Tissue Gestation, C-Section Scar Ectopic.

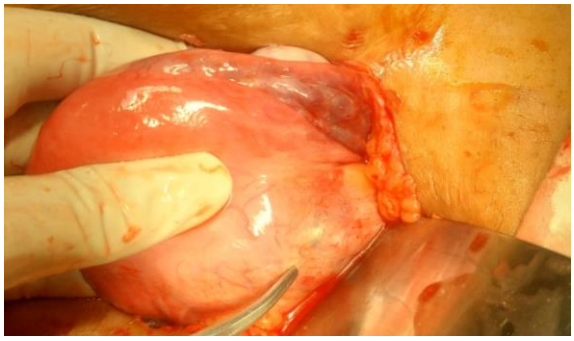
INTRODUCTION

Scar ectopic pregnancy is characterized by the implantation of a gestational sac within the scar tissue from a previous cesarean section. This atypical implantation presents significant risks and diagnostic challenges due to its rarity. With the rising rate of cesarean sections over time, the incidence of scar ectopic pregnancy is also increasing.[1] Spontaneous abortion and pre-term delivery are the common complications of this condition.[2,3] However, scar implantation becomes particularly dangerous when there is an adherent placenta, sometimes necessitating emergency hysterectomy.[4] Consequently, the quality of life for women affected by this type of ectopic implantation within the scar deteriorates.

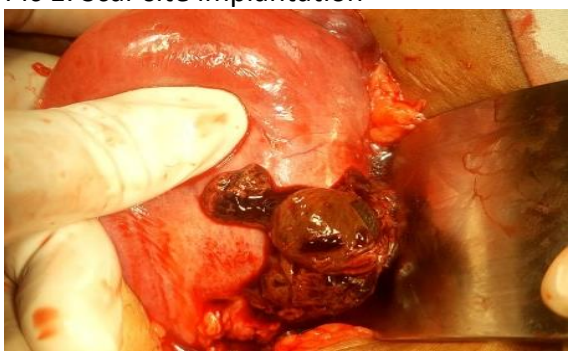
CASE REPORT

A 35-year-old woman, para 2CS+0, gravida 3rd, with no history of vaginal bleeding or expulsion of product of conception after taking abortificant drugs (combination of mifepristone and misoprostol) 1 week ago following 8 weeks of amenorrhea. Her last cesarean section was done 2.5 years ago. No other significant medical or gynecological history was noted.

On clinical examination, she was found to be hemodynamically stable, with no signs of acute distress. Abdominal examination revealed no abnormality.



Pic 1: Scar site implantation



Pic 2: Clot within the scar

Abdominal ultrasound revealed retained product of conception measuring about 5cm X 3cm.

1. Dr. Mst. Munira Akter Khanam, Lecturer, Department of Biochemistry, Patuakhali Medical college, Patuakhali.
2. Md. Faisal, junior Consultant (Gynae), Sher-E-Bangla Medical College Hospital, Barishal, Bangladesh.

Correspondence: Dr. Mst. Munira Akter Khanam, Lecturer, Department of Biochemistry, Patuakhali Medical college, Patuakhali.

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The patient underwent thorough evaluation for anesthesia fitness and was prepared for Manual Vacuum Aspiration (MVA).

During the MVA procedure brisk hemorrhage was noted per vaginally, and the patient became hemodynamically unstable. Consequently, the procedure was immediately postponed. After symptomatic management of haemorrhage transfusion of three units of fresh whole blood, the patient became hemodynamically stable. Then TVS was done to recheck it. Transvaginal ultrasound (TVS) was performed to recheck the findings, which were similar to those of the abdominal scan. Subsequently, exploratory laparotomy was planned. After proper counselling of the patient laparotomy was performed, revealing clotted products of conception on the previous cesarean scar. The Products were removed accordingly, and diagnosis was confirmed with histopathology.

DISCUSSION

Different sites of ectopic pregnancies are fallopian tube, cervix, ovary etc. In our case implantation was found within uterus but in a previous scar. Sometimes recurrent scar ectopic has been observed.[1] Uterus may have scars for different reasons such as caesarian section, dilation, evacuation and curettage (DE&C), myomectomy, etc. In our case, the patient had a history of previous caesarian section.

Diagnosis of scar ectopic pregnancy is challenging due to its atypical location within the cesarean scar.[2] Ultrasound, the primary imaging modality for ectopic pregnancies, may not consistently identify scar ectopic pregnancies because of their location within the cesarean scar, potentially leading to missed or delayed diagnosis. Additionally, the absence of specific diagnostic criteria or established guidelines contributes to the difficulty in distinguishing these cases from other ectopic or intrauterine pregnancies.[3] Initially, we missed the diagnosis but later were able to diagnose it.

Potential risks associated with scar ectopic pregnancy include rupture of hollow organs. Chance of rupture is higher beyond the first trimaster.[4] In our case rupture did not occur. Scar ectopic pregnancies can be managed both conservatively and surgically. We opted for surgical treatment in this case.

CONCLUSION

Cesarean section ectopic pregnancy is an uncommon variety of ectopic pregnancy. Now a days, this type of ectopic pregnancy is being observed more frequently as the rate of cesarean sections increases. Routine ultrasonography in early pregnancy can commonly diagnose this condition. Early diagnosis is essential for preventing complications.

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