JOURNAL OF COMILLA MEDICAL COLLEGE TEACHERS' ASSOCIATION

The Official Organ of Comilla Medical College Teachers' Association

Journal of Comilla Medical College Teachers' Association
Vol. 26, No. 01, January 2022

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Editorial

There is Glimpse of Light at all Dead Ends of Medical Exploration

Sheikh Mohammad Fazle Akbar[1], Mamun Al Mahtab[2]

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From the original conceptions of the last few centuries, the school of thought has taught that microbial infections can be tackled by using antimicrobial agents. This has been found to be almost true in the context of fighting against bacteria fungus, and other microbes. To fight against the virus, idoxuridine has been developed as first antiviral drug in 1963. This has been followed by development of about 90 antiviral drugs categorized in 13 functional groups for treatment of mostly 9 human diseases (1). However, application of antiviral drugs to virally-infected patients exposed that these drugs are not enough to eradicate the viruses in most cases and there is a need to have a complete reconstruction of brain tissues of the drug developers to formulate new drugs for control of viral diseases.

In the context of chronic hepatitis B virus (HBV), various conceptual developments need proper discussion. Millions of chronic HBV-infected patients exhibit: (1) viral persistency either in the patient's sera of liver, (2) exacerbation and remission of inflammation of the liver (hepatitis), progression of hepatic fibrosis leading to deformation of nodular structure of the liver (cirrhosis of the liver [LC]), and carcinogenesis of the liver (hepatocellular carcinoma [HCC]. If these patients remain untreated, soon, the numbers of HBV-related deaths would touch the line of one million. Two groups of drugs were developed to combat chronic HBV infection; one being the interferon (IFN) and its pegylated forms and the other belongs to the group of nucleoside analogs (NUCs). Although 40 years have passed after initiating use of IFNs and during last 25 years, NUCs have been massively used around the world. As of today, both of these drugs either independently or as part of combination therapy has failed to facilitate the dream of ERADICATION of HBV or CURE OF HBV, or even FUNCTIONAL CURE of HBV in majority of chronic hepatitis B (CHB) patients. The underlying causes are numerous, but the fundamentals are easy to understand and related to HBV pathogenesis. First of all, HBV is mainly a non-cytopathic virus that HBV and it is (1) unable to induce inflammation of the hepatocytes, (2) never produce toxins to induce fibrosis and LC(3) does

not belong the property of carcinogenesis by itself. Highly sophisticated studies in animal models and with liver of CHB patients unmasked that the host immunity following entry of HBV induce dysfunctional and distorted. This distorted immunity, in turn, causes hepatitis, LC and HCC. Thus, the failure of antiviral drugs are now clear and there remains pressing need to develop evidence-based drugs for shaping the distorted immunity of CHB patients.

During the last three decades, we and others tried to develop immune therapy to reverse distorted immunity of CHB patients. However, polyclonal immune modulators and HBsAg-based preventive vaccine could not stand the test of time, as evident following trials of three decades. This led to discovery of a therapeutic vaccine that is fundamentally different from preventive HBsAg-based vaccine, and containing both HBsAg and HBcAg (NASVAC) (2). In preclinical studies were accomplished in early 21st century in Cuba and Japan with normal and HBV transgenic mice to optimize the utility of NASVAC in chronic HBV-infected subjects (3). Also, the utility of NASVAC via nasal route was considered and studies provided excellent data about mucosal immunity induced by NASVAC. From 2009, NASVAC was subjected to aphase I/II clinical trial in Bangladesh revealed that NASVAC is safe for CHB patients and also NASVAC induced reduction and negativity of HBV DNA in the sera with normalization of ALT in all 18 patients of this cohort (4). Also, we explored how NASVAC induced activation of antigen-presenting dendritic cells by cellular and molecular studies. A phage III study in 180 patients also revealed that NASVAC is better than pegylated interferon in respect to safety, reduction of HBV DNA, normalization of ALT (5). This is the only study in the world that published the data of 2 and 3 years follow up of any immune therapeutic for CHB. It showed highly optimistic outcome of NASVAC even during this long-term follow up (6,7).

Thus, there remain opportunity to treat microbes by not killing microbial agents directly, rather than by inducing proper immunity to the host. The principle has brought a fundamental challenge to treat all chronic infections and cancers. The need of surgery, anti-cancer drugs, radiation and another maneuver need to be reassessed. The principle of treatment by NASVAC reveals that all sorts of cancers is under treatment by controlling their immunity. The development of NASVAC herald a new revolution of drug development by targeting host immunity.

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Original Article

Socio-demographic Profile of Sexual Assault Victims attending in the Forensic Medicine Department of Comilla Medical College.

Sharmin Sultana[1], Al Amin[2], Tasnim Israt[3], Roksana Akter[4], Mohammad Izazul Hoque[5], M Shamsul Islam[6]

Abstract:
Background: Sexual assault is defined as sexual intercourse performed in a way which is against the provision of the law of the land. Rape is the unlawful sexual intercourse by a man with a woman without her consent, against her will or with her consent obtained by force, fear, or fraud or with any woman with or without her consent below the age of 14 years. Young girls and children remain the most vulnerable group. The alarming rise in the rate of sexual assault worldwide represents a major public health problem. **Methodology:** This retrospective study was conducted on 272 sexually assaulted victims who reported in the Forensic Medicine Department of Comilla Medical College (CoMC) for medical examination during the period between January 2020 and June 2021. Details pertaining to age, sex, religion, literacy, socioeconomic status, site of incidence, time interval between incidence and medical examination, number of assailants, relationship with assailant and pregnancy outcome collected during examination was noted. The statistical analysis was done by the Statistical Package for Social Sciences version 23.0 for Windows. **Results:** Among 272 victims 14(5.14 %) were male and 258 (94.86%) female, mean age was 15.39 ± 12.42. Most of the victims 62.86% were in 10-20 years age group. A large number of victims were students 202(75%), 235 (86.39%) population were from rural, Secondary School going 196(72.05%) and 63.34% belongs to low economic status. 187(68.75%) assaulted victims were unmarried, single assailant 254(93.38%) and 40% occurrence at home. Only 13.6% came for medical examination within 24 hours. 260(93%) were known to the victims where 88(33.58%) were boy friend. 55(20.22%) were kidnapped. Outcome of victims, Among 258 victims total 26(10%) were pregnant. **Conclusion:** Young women and children are the vulnerable group for sexual assault. Maximum victims were students of secondary school and were assaulted by their known or boy friend at native home. So free mixing should be strictly prohibited. 20.22% were kidnapped so steps should be taken to improve the citizen security by government. 10% were pregnant so needs to develop a legislative humanitarian initiative for them.

Keywords: Victims, assailant, sexual assault, rape.

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Introduction:

Sexual offence can be defined as sexual intercourse performed in a way, which is against the provision of the law of the land.[1] Rape is defined as the unlawful sexual intercourse by a man with a woman without her consent, against her will or with her consent obtained by force, fear, or fraud or with any woman with or without her consent below the age of 14 years[1]. According to Bangladesh Penal Code (BPC-375) six different aspects of special considerations are laid down[2]. The slightest penetration of the penis within the vulva, such as the minimal passage of glans between the labia with or without emission of semen or rupture of hymen, constitutes a rape[3]. So it can be said rape is an allegation easily made, hard to prove and harder to disprove. Sexual intercourse by a man with his wife, the wife not being under thirteen years of age, is not rape[2].

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NCRB data in 2018 recorded 59% crime rate against women, one rape is reported every 15 minutes in India. Every fourth rape victim across the country in 2018 was a minor, while more than 50 per cent of them fell in the age category of 18 to 30 years. In 94 per cent of the cases, the offenders were known to the victims who were family members, friends, live-in partners, employers or others[5]. The popular belief in the society that only women are subjected to sexual cruelty and harassment is no longer truth as incidence with young male victims are also common. In the present study, efforts were made to study the social and demographic factors so that we can identify the high-risk population at the earliest and stringent legislative measures can be taken to safeguard the interest of the victims and society at large.

Methodology:

It was a single center, retrospective observational study. Conducted in Forensic Medicine department of Comilla Medical College, Cumilla. After taking ethical clearance from the authorized body Records of all the sexually assaulted victims who reported Comilla Medical College (CoMC) for medical examination during the period between January 2020 and June 2021 was undertaken. Details pertaining to age, sex, religion, literacy, socioeconomic status, site of incidence, time interval between incidence and medical examination, number of assailants, relationship with assailants and pregnancy outcome collected during examination was noted. The statistical analysis was done by the Statistical Package for Social Sciences version 23.0 for Windows.

Results:

Among 272 victims 14(5.14 %) were male and 258 (94.86%) female, mean age was 15.39 ± 12.42. Most of the victims were in 10-20 years age group, followed by 21-30 years (19.30 %).(fig.1).

Table I. Distribution of victims according to sex (N=272)

Variable	Number	Percentage (%)
Sex		
Male	14	5.14
Female	258	94.86

Lowest age 7 years, highest age 50 years and mean 15.39 ± 12.42.
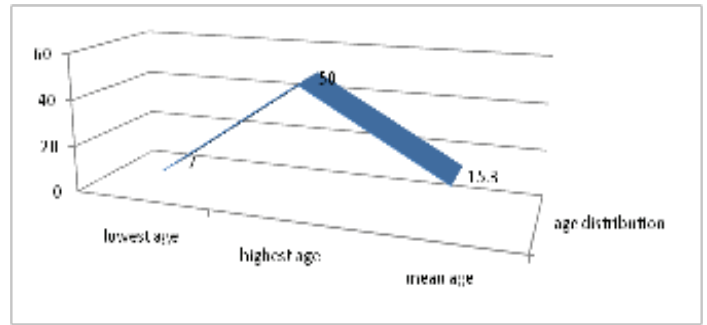
Fig.1. Distribution of victims according to lowest and highest age (N=272) (mean 15.39 ± 12.42)
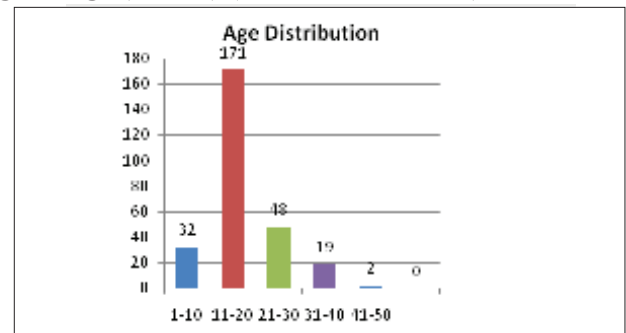
Fig.2. Distribution of victims according to age (N=272) (mean 15.39 ± 12.42)

A large number of victims were students 202(75%), (fig.2) 235 (86.39%) population were from rural, Secondary School going 196(72.05%) and 64.24% belongs to low economic status (table II).
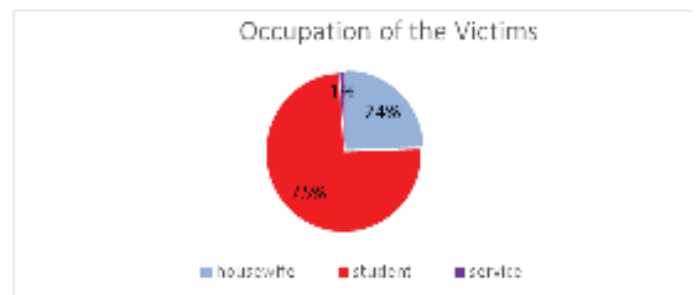
Fig.3. Distribution of victims according to occupation (N=272)

Table II. Distribution of victims according to residency, economic status and educational level (N=272)

Variable	Number	Percentage (%)
Resident		
Rural	235	86.39
Urban	37	13.61

Socioeconomic condition		
Low	175	64.34
Middle	97	35.67
upper	1	0.36
Educational level		
Primary	56	20.58
High school	196	72.05
college	19	6.98

187(68.75) assaulted victims were unmarried, single assailant 254(93.38%) and 40% occurrence at home. Only 13.6% came for medical examination within 24 hours.

Table III. Sexual offence related characteristics of study population (N=272)

Variable	Number	Percentage (%)
Marital status of the victims		
Married	53	19.48
Unmarried	187	68.75
widow	18	6.6
Number of assailant		
1	254	93.38
2	6	2.2
3	10	3.67
>3	1	0.36
Place of occurrence		
Home	109	40.07
Relative home	31	11.39
others	132	48.52
Time interval of Medical examination and occurrence		
Within 24 hours	37	13.6
1-3 days	57	20.95
3-7 days	26	9.55
7-15 days	17	6.25
>15 days	135	49.6

260(93%) were known to the victims where 88(33.58%) were boy friend. 55(20.22%) were kidnapped.
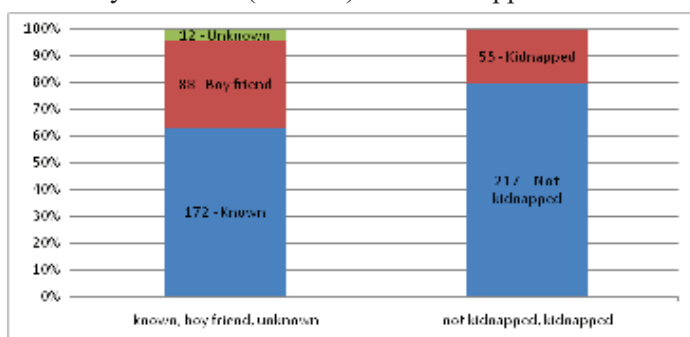
Fig.4. Distribution of victims according to Relationship with assailant and kidnapping (N=272)

Among 258 victims total 26(10%) were pregnant.

Fig. 5. Outcome of victims.

Discussion:
Globally, at least one in three women and girls is beaten or sexually abused in her lifetime.[6] Sexual assault is a neglected public health issue in most of the developing countries and there is likely to be an even smaller percentage reporting sexual assault.[7] The under reporting of cases of sexual assaults are mainly due to social stigma, prejudice with regard to the chances of marriage, being considered promiscuous and responsible for incident, attended humiliation and shame, embarrassment caused by appearance and cross examination in court, publicity in press, risk of losing the love and respect of society, friends and that of her husband, if married.[8] This study was conducted on 272 alleged Sexual assault victims with (62.86%) belonging to the 11-20 years age group. the mean age of 15.39 yrs. These results are in agreement with the study of Al-Azad MAS et al[9] 2011 found 69.57% were in 11-20 years age group, M Iram et al 2010[10] were found Maximum number of victims was reported in the age group 10-19 years (n=46, 62.2%), PK Bose et al 2018[11] found female of >10-_20 years of age group were the main victims and 69.6% of the victims belong to this age group.

The majority of the victims 187(68.75%) were unmarried, high school going (72.05%), 86.39% rural and 64.34% were from a low socioeconomic background. Similar findings were observed by Al-Azad MAS et al[9] 2011 found 78.69% were unmarried, 32.18% were less educated and 77.89 % were with poor socioeconomic background. M Iram et al 2010[10] were found The maximum incidence of rape was reported in unmarried (n = 55, 74.3%), Sarkar et al[12], Barek[13] in a study observed that 89.77% victims were educated. On the other hand Islam et al[14] reported that majority of the victims were illiterate. Ganguly et al[15] reported 60% of the victims were from poor family, 43% were illiterate. Most of rape victims were assaulted by single assailant (93.38%). It was noted that the assailant was identified by the rape victim in 93% of the cases. When the relationship of the victim and accused were explored. In a maximum number of cases, the assailants had a friendly relationship 88 (33.5%). with their victims and had sexual activities after absconding together. L

Verma et al 2020[16] found In about 98% cases the accused were known to the victims and in about 80% cases significant relationship was present between the accused and victim.

Honourable Justice V Parthiban of the Madras High Court opined in the order concerning Criminal Appeal No. 490 of 2018 that the government should consider to redefine the word "child" to mean a person below 16 years of age instead of 18 for purposes of the Protection of Children from Sexual Offences (POCSO) Act 2012. Noting that many of the POCSO cases involved minor teenage girls in sexual relationships with teenage boys, Justice Parthiban said: "When the girl below 18 years is involved in a relationship with the teenage boy or little over the teenage, it is always a question mark as to how such relationship could be defined, though such relationship would be the result of mutual innocence and biological attraction. Such a relationship cannot be construed as an unnatural one or alien to between relationships of opposite sexes. But in such cases where the age of the girl is below 18 years, even though she was capable of giving consent for a relationship, being mentally matured, unfortunately, the provisions of the POCSO Act get attracted if such relationship transcends beyond platonic limits, attracting strong arm of law sanctioned by the provisions of POCSO Act, catching up with the so-called offender of sexual assault, warranting severe imprisonment of 7/10 years".[17]

In the study, the most reported site of offence 40.07% was the victim's house followed by 20.22% were kidnapped. Sarkar et al[12] reported 41.1% of the incidence occurred at victim's house. Total 38.69 % victims in this study reported to Forensic Medicine Department of DMC in the same day of incident that differs with the study of Barek[13], where the author found only 13.6% undergone for medico legal examination in 1st day. This may be due to the awareness of the population of capital city, Dhaka. Among 258 victims total 26 (10%) were pregnant which had a profound impact on the physical and mental health and is associated with an increased range of sexual and reproductive health problem with both immediate and long term consequences.

Conclusion:
Young women and children are the vulnerable group for sexual assault. Maximum victims are students of secondary school and are assaulted by their known or boy friend at native home. So free mixing should be strictly prohibited. 20.22% were kidnapped so steps should be taken to improve the citizen security by government. 10% are pregnant so needs to develop a legislative humanitarian initiative for them.

Limitation:
It was a single center study so need multi centered study to know the actual socio-demographic status of the country.

Recommendation: Need multi centered study to know the actual socio-demographic status of the country.

Acknowledgement: The authors which to acknowledge the assistance of the medical records unit of Forensic Medicine Department of Comilla Medical College.

Conflict of interest: Authors declared no conflict of interest.

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Original Article

Bacterial Profile Isolated from Stethoscope used in Inpatient and Outpatient in a Tertiary Care Hospital

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Abstract:

Background: Nosocomial infection is also called as hospital acquired infection or healthcare associated infections.The natural history of the development of nosocomial infections appear to begin with exposure of patients to pathogenic bacteria which have colonized hospital equipment or the skin and nasopharynx of hospital personnel. From this exposure some patients will develop skin, mucous membrane or intestinal colonization with these bacteria. Those patients with lowered host defense mechanisms, with open wounds or who have undergone surgical manipulation may then develop clinical infection with these organisms by "auto-inoculation". **Objectives:** The General objectives of the study were to evaluate the bacterial profile in stethoscopes used by the physicians working in inpatient and outpatient department. The Specific objectives were to identify and isolate the types of bacterial pathogen present on stethoscopes and to compare the bacterial profile in stethoscope between inpatient and outpatient department. **Methods:** This cross-sectional and comparative study was conducted indoor and outpatient department of Sylhet MAG Osmani Medical College Hospital, Sylhet for one year period. Stethoscopes used by the physician of inpatient and outpatient department of Sylhet MAG Osmani Medical College Hospital were consecutively included as study population. Total 90 Sample were collected from Medicine, Surgery and Obstetrics and Gynaecology department. Stethoscope used outside Sylhet MAG Osmani Medical College Hospital and which disinfected regularly was excluded. Here self-administered questionnaire was used to collect demographic data and information. Specimen was collected as swab stick impressions from diaphragm of the used stethoscope. Specimens were cultured and isolates were identified by using standard microbiological technique. The results were presented in tables and figures. **Result:** About 90 stethoscopes were examined, 43 (48%) were considerably contaminated and the rest 47 (52%) were not contaminated. In IPD out of 45 stethoscope diaphragms 29 were contaminated and total 5 bacterial stains were isolated. Among gram positive isolates Staphylococcus aureus was the most frequent isolates (34%) followed by Staphylococcus epidermidis. Among gram negative isolates Esch.coli (34%) was the most frequent isolates followed by Klebsiella pneumoniae. In IPD among different departments majority of the isolates 14 (48%) were found from department of Medicine. In OPD out of 45 stethoscope diaphragms 14 were contaminated and total five bacterial strains were isolated. Among gram positive isolates Staphylococcus aureus 05 (36%) was the most frequent isolate followed by Staphylococcus epidermidis. Among gram negative isolates Esch.coli 04 (27%) was the most frequent isolates followed by Klebsiella pneumoniae. In OPD among different dept majority of the isolates (50%) came from Medicine department. **Conclusion:** Infection caused by contaminated medical devices could markedly threaten the health of patients in hospitals. Simple cleaning would reduce the risk of transmission of microorganisms and prevent the outbreak of infection.

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Introduction:
Hospital acquired infection or healthcare associated infections may be caused by infectious agents from endogenous (body sites) or exogenous sources (patient care personnel, visitors, patient care equipment, medical devices, or the health care environment). Every year, millions of people across the world suffer from health care associated infections (HAI). HAIs are a wide-ranging concern in the medical field, not only because of morbidity and the possibility of lethal consequences for patients, but also because of extended hospital stays and associated high costs[1].

WHO defines a nosocomial infection in the following way :"An infection acquired in hospital by a patient who was admitted for a reason other than that infection. An infection occuring in a patient in a hospital or other health care facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge and also occupational infections among staff of the facility"[2].

The development of infection during hospitalization is a significant problem encountered daily on every hospital ward. The reported incidence of nosocomial infections is between 3.5 and 15.5% of all hospitalized patients[3]. Respiratory tract infections, urinary tract infections and postoperative wound infections are the major- types of nosocomial infections[4]. The predominant organisms responsible for these infections are Enterococci, Methicillin- resistant staphylococci, Ciprofloxacin-resistant Pseudomonas aeruginosa, Gentamicin- resistant organisms, Ceftazidime- resistant Klebsiella pneumoniae, Vancomycin- resistant P. aeruginosa and Penicillin-resistantPneumococci[5].

Strict hand washing and cleaning of the health care environment are measures effective in reducing HAIs[6]. Hand washing has been cited as the most effective infection control method and the rates of hand washing have improved; this has correlated with a focused approach by hospital infection control committees of USA to meet Joint Commission (2010) regulatory mandates regarding hand washing. Stethoscope is the symbol of health professionals. Due to their universal use by health professionals, stethoscopes can be a potential source of infections [7]. Auscultation of the heart, lungs, abdomen and major arteries with a stethoscope has long been considered an integral part of the physical examination and most health care providers prefer to use their own stethoscope. It has long been known that the diaphrams and bells of stethoscopes randomly sampled in a health care setting such as a hospital are almost universally contaminated by potential nosocomial pathogens. Following contact with infected skin, pathogens can attach and establish themselves on the diaphragms of stethoscopes and subsequently be transferred to other patients if the stethoscope is not disinfected[8].

Methods:
This cross-sectional and comparative study was conducted indoor and outpatient department of Sylhet MAG Osmani Medical College Hospital, Sylhet. Stethoscopes used by the physician of inpatient and outpatient department of Sylhet MAG Osmani Medical College Hospital were consecutively included as study population. Total 90Sample were collected from Medicine, Surgery and Obstetric and Gynaecology department (15inpatient and 15 OPD). Stethoscope used outside the SOMCH and which disinfected regularly were excluded. Specimens were collected after taking consent from stethoscope users. Here self-administered questionnaire was used to collect demographic data and information. Specimen were collected as swab stick impressions from diaphragm of the used stethoscope and numbered accordingly. Before taking impression each sterile swab stick was moistened with sterile normal saline solution (0.9% w/v normal saline). Data were collected in pre-designed data collection sheet from the inpatient and OPD physicians of Sylhet MAG Osmani Medical College. The results were presented in tables and figures.

Blood agar media and MacConkey's agar media (both are selective and indicator media) were used for bacterial isolation and identified by standard laboratory procedure. Isolation and identification of bacteria from the collected specimens in this study included culture of the specimens, observation of growth, microscopic and biochemical identification. The laboratory procedures for ten (10) to fifteen (15) specimens were performed in each day. The procedure required two (02) to three (03) days to complete for each specimen.

Results:
Table-I: Distribution of stethoscope users according to Employment status

Employment status	IPD	OPD	Percentage
Employed doctor	11	24	35 (39%)
HMO	9	8	17 (19%)
Intern	25	13	38 (42%)
Total	45	45	90 (100%)

Table I shows the distribution of stethoscope users according to Employment status. A total 90 stethoscopes owned by three group of professionals, were examined for

bacterial contamination.

The professionals include employed doctor, HMO, Intern. Of them 35 (39%) were employed doctor, 17 (19%) were HMO, 38 (42%) were Intern.

Table-II: Distribution of stethoscopes according to presence/absence of organism in different departments

Place	Growth	No growth	Percentage
IPD	29 (64%)	16 (36%)	45 (100%)
OPD	14 (31%)	31 (69%)	45 (100%)
Total	43 (48%)	47 (52%)	90(100%)

Table II shows presence or absence of organism in stethoscopes in different wards in Inpatient department (IPD) and Outpatient department (OPD). About 90 stethoscopes were examined, 43 (48%) were considerably contaminated and the rest 47 (52%) were not contaminated. All stethoscopes owned by Employed doctor, HMO, Intern.

In IPD 45 stethoscopes were examined, 29 (64%) were considerably contaminated and the rest 16 (36%) were not contaminated and in OPD 45 stethoscopes were examined, 14 (31%) were considerably contaminated and the rest 31 (69%) were not contaminated.

Table-III: Distribution of stethoscopes according to presence of isolated organism in IPD of different dept (n=45).

Organism	IPD			Percentage
	Gynaecology	Medicine	Surgery	
Staph. aureus	3	4	3	10 (34%)
Staph. epidermidis	1	1	1	03 (10%)
Esch.coli	1	6	3	10 (34%)
Klebsiella pneumoniae	1	1	0	02 (06%)
Mixed growth	1	2	1	04 (14%)
Total (%)	7 (24%)	14 (48%)	8 (28%)	29(100%)

In IPD out of 45 stethoscope diaphragms 29 were contaminated and total 5 bacterial stains were isolated. Isolated organisms were Staphylococcus aureus, Staphylococcus epidermidis, Esch.coli, Klebsiella pneumoniae and mixed growth, are structured accordingly. Majority of the isolates were potential pathogens. Among gram positive isolates Staphylococcus aureuswas the most frequent isolates (34%) followed by Staphylococcus epidermidis. Among gram negative isolates Esch.coli (34%) was the most frequent isolates followed by Klebsiella pneumoniae.

This table also shows that in IPD among different department out of 29 contaminated stethoscopes 7(24%)

stethoscopes were from Obstetrics and Gynaecology department, 14(48%) from Medicine, 8(28%) from Surgery department. In IPD among different departments majority of the isolates 14(48%) were found from department of Medicine.

Table-IV: Distribution of stethoscopes according to presence of isolated organism in OPD of different department (n=45).

Organism	OPD			Percentage
	Gynaecology	Medicine	Surgery	
Staph. aureus	2	2	1	05 (36%)
Staph. epidermidis	0	0	1	01 (07%)
Esch.coli	0	3	1	04 (27%)
Klebsiella pneumoniae	1	1	1	03 (21%)
Mixed growth	0	1	0	01 (07%)
Total (%)	3 (21%)	7 (50%)	4 (29%)	14 (100%)

In OPD out of 45 stethoscope diaphragms 14 were contaminated and total five bacterial strains were isolated. Isolated organism were Staphylococcus aureus, Staphylococcus epidermidis, Esch.coli, Klebsiella pneumoniae and mixed growth. Majority of the isolates were potential pathogens. Among gram positive isolates Staphylococcus aureus05 (36%) was the most frequent isolate followed by Staphylococcus epidermidis. Among gram negative isolates Esch.coli 04 (27%) was the most frequent isolates followed by Klebsiella pneumoniae.

This table also shows that in OPD among different departments out of 14(100%) contaminated stethoscopes 3(21%) stethoscopes were from Obstetrics and Gynaecology department, 7(50%) from Medicine, 4(29%) from Surgery. In OPD among different dept majority of the isolates (50%) came from Medicine department.

Discussion:

The introduction of medical devices for management and treatment of diseases has contributed to the development of health care associated infection (HAIs) worldwide with the consequence that on many occasionlead the patient in to poor prognosis. The introduction of such devices is not wrong by itself, instead facilitates the medical procedures and save patients lives, but commitment deficit of some medical personnel's to the infection prevention protocols was significant[9].

Table I shows employment status of current study. Samples were taken from the diaphragm of stethoscopes from different department of Sylhet MAG Osmani Medical college hospitals. A total 90 stethoscopes owned by three group of professionals, were examined for bacterial contamination. The professionals included employed

doctors, HMOs and Interns. Out of them 35 (39%) were employed doctors, 17 (19%) were HMOs and 38 (42%) were Interns (Table I). This is comparatively lower than the study of Shiferaw et al. (2013)[9] in where a total of 176 stethoscopes owned by nine different professionals were examined for bacterial contamination. Table III and IV revealed five contaminated bacterial species from 43 contaminated stethoscopes. Isolated organisms were Staphylococcus aureus, Staphylococcus epidermidis, Esch.coli, Klebsiellapneumoniae and mixed growth. This is much lower than the study of Shiferaw[9] and Miangi and Andriole, Uneke and his colleagues[10]. A study of Kilic et al. (2011) showed much more contaminated bacterial species which were non-pathogen or slightly pathogenic bacteria such as Staphylococcus epidermidis, Bacillus spp., Sarcinia spp. and Corynebacteria spp, and pathogenic bacteria were E. coli, S. aureus and Enterococcus spp than the present study[11]. In a similar study, coagulase negative staphylococci (CoNS), S. aureus, Candida albicans, Acinetobacter spp., Stenotrophomonas maltophilia, Bacillus sp., Corynebacteria spp., E. coli and non-fermenting Gram negative rods were detected on samples[12]. In another study, seven MRSA, seven Enterobacter cloacae were isolated from stethoscopes in the intensive care unit[13]. There could be a variety of reasons for the differences. This variation of outcome may be use of large number of samples in those studies or may be due to infrequent, inadequate or ineffective disinfection practices. Alternatively the differences may be due to lack of training on disinfection practices or lack of motivation within hospital managements. The sharing of stethoscopes, a common practice among the hospital staff, may have led to the transmission of these agents. The colonization in the skin may spread to the nose can lead to hospital acquired infections in the Health care workers (HCW) as well as in the patients[14].

Table III, IV in present study also showed presence of most frequent bacterial pathogens. The study revealed that among contaminated gram positive bacterial pathogen in IPD and OPD Staphylococcus aureus 34% and 36% respectively was most frequent isolates. This is comparatively higher than the study of Jones[15] who found 19% stethoscopes contaminated with S. aureus[16].

The current study also showed comparatively lower isolation of Staphylococcus aureus (36%)than the study of Marinella[17] in which S. aureus was the most common bacterial pathogen isolated from the stethoscopes studied (53.6%), and the study of Uneke et al. (2010) where Staphylococcus aureus contamination rate of 53.6% was recorded .

A number of previous investigations found

Staphylococcus aureus on 15.8% to 89% of stethoscopes used by health workers[18,19,20]. In another study conducted by Uneke[21], on the stethoscopes in Nigeria, Staphylococcus aureus was major isolates.

This might be because of the direct contact of the stethoscope to human skin flora, which contains mostly gram-positive bacteria such as Staphylococcus aureus which is most common flora of human skin; it is also well documented fact that S.aureus is a primary causative agent of health care associated infection[22]. Although, the life span of Gram negative is maximally 6 hour in vitro, the half life span is less than an hour; Gram positive bacteria remain alive for a longer period of time. However, excessive bacterial colonization on stethoscope diaphragm enables them to remain alive for a period exceeding 8 hour[12].

Table III, IV in present study also shows presence of most frequent gram negative bacterial pathogen in IPD and OPD was Esch. coli which was 34% and 27% which have no similarity with the study of Shiferaw[9] where the most common Gram negative isolate was Klebsiella pneumoniae (4.7%).
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Conclusion:
Nosocomial infections are worth preventing in terms of benefits in morbidity, mortality, duration of hospital stay, and cost. Educational interventions promoting good hygiene and aseptic techniques have generally proved to be successful, but these practices are often not sustainable. Greater efforts are being made in some countries to ensure the application of the infection control evidence base into practice.

Total 5 bacterial strains were isolated. The organisms Staphylococcus aureus, Staphylococcus epidermidis, Esch.coli, Klebsiella and mixed growth were potential pathogens. Among gram positive isolates Staphylococcus aureus was the most frequent isolates and Staphylococcus epidermidiswas also present. Among gram negative isolates Esch.coli was the most frequent isolates and Klebsiella pneumoniae was present in lesser numbers.

So irrespective of the contaminated site, the method of use of maintenance, all most all the diaphragm of stethoscopes had bacterial contamination. However, simple cleaning would reduce the risk of transmission of microorganisms and prevent the outbreak of infection. Infection caused by contaminated medical devices could markedly threaten the health of patients in hospitals now care for far more immunocompromised patients than in previous times. Different

species have the ability to acquire multidrug resistance and these species can be extremely virulent for population at risk. Information on stethoscope as a source of nosocomial infection would be highly useful to upgrade infection control measures in hospital.

Limitations of the study:

The study population was small (90) due to time constraint and budgetary limitation. The study was conducted on doctors of different wards of only one hospital which may not represent the overall picture prevailing in different hospitals and geographical locations

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Original Article

Correlation between Serum Complement C3 and FIB4 Index with Stages of Fibrosis of Liver by Fibroscan in NAFLD Patients

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Abstract:

Background: Despite the high prevalence of NAFLD non-invasive markers of disease activity and severity remain limited. A single, cheap available marker with high sensitivity and specificity is yet to be identified. The present study intends to find out the utility of serum Complement C3 and FIB4 Index to predict stages of fibrosis of liver in NAFLD patients. **Methods:** This cross sectional study was done at department of GHPD, BIRDEM General Hospital, Dhaka, during the period of January 2016 to October 2017. A total of 105 sonographically diagnosed admitted and OPD NAFLD subjects were included in the study. Statistical analysis was done with SPSS version 16. **Result:** Out of 105 subjects, 70 (66.7%) were female and 35(33.3%) male. Serum complement C3 (mg/dl)142.30±21.02 (mean±SD). USG of W/A or HBS showed 61(58.10%) had grade I, 33(31.43%) grade II, 11(10.48%) grade III fatty liver disease. Fibroscan showed no fibrosis in 31(29.52%), F1 stage of fibrosis in 22(20.95%) and F2 in 22(20.95%). FIB4 Index was 1.22±0.76 (mean±SD). Pearson correlation test showed stages of fibrosis by Fibroscan had significant positive correlation with FIB4 index, weak negative correlation with serum complement C3 **Conclusion:** The positive correlation of stages of fibrosis by Fibroscan with FIB4 index was significant whereas negative correlation with serum complement C3 was not so significant statistically. Sensitivity and specificity of serum Complement C3 and FIB 4 Index as fibrosis marker was not so significant. Serum Complement C3 and FIB4 Index may not be used as a marker of severity of fibrosis.

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Introduction:

Fatty liver diseases (FLD) is the most common liver dysfunction worldwide and can be categorized as nonalcoholic FLD (NAFLD) or alcoholic FLD (AFLD) according to etiology (Chalasani et al. 2012 & O'Shea et al. 2010). Fatty liver diseases can lead to a spectrum of ranging from simple hepatic steatosis, steatohepatitis, liver fibrosis, cirrhosis and even hepatocellular carcinoma (Kleiner & Brunt, 2012). Non-alcoholic fatty liver disease (NAFLD) is the most common chronic liver disease worldwide, with a global prevalence estimated at 25% of the world's population, but with geographical variability; the highest prevalence has been noted amongst western countries (Hjelkrem et al. 2008; Chalasani et al.2012; Farrell et al. 2013).

Diagnostic methods for NAFLD are various and include using combination of clinical, laboratory tests with imaging methods or liver biopsy (Chalasani et al. 2012). Up to 70% of patients with fatty liver do not show laboratory abnormalities (Browning et al. 2004) . An increase in serum levels of liver alanine aminotransferase (ALT), which correlates with liver fat independently of adiposity and to a lesser degree aspartate aminotransferase (AST) can be found (Kotronen et al. 2007). Serum alkaline phosphatase and Gama glutamyltransferase (GGT) are also mildly increased associated with liver fat Independent of adiposity (Thamer et al. 2005)

Among imaging methods (USG, CT, MRI) MRI/MRS is the gold standard for diagnosis of fatty liver but it is

expensive (Sanyal and American Gastroenterological, 2002). USG is more sensitive than CT and safe, non-invasive method which provides appropriate information about hepatic steatosis.

Liver biopsy remains the best diagnostic tool for confirming NAFLD and evaluating necroinflammation/fibrosis as well as the most sensitive and specific means of providing important prognostic information of the disease and to monitor the effectiveness of an intervention (Chalasani et al. 2012) . Despite its limitations it is recognized that a biopsy can over or underestimate the degree of disease (Ratziu et al. 2006; Merriman et al. 2006). Given the invasive nature of liver biopsy and other caveats with this technique, it is clear that noninvasive, reliable methods like the FIB-4 index, BARD score, the NAFLD fibrosis score or the fibroscan required for assessment of degree of fibrosis (Musso et al. 2011; Wong et al. 2010; Bowman et al. 2011)

The FIB-4 index is a simple and noninvasive algorithm consisting to evaluate liver fibrosis in NAFLD patients by using routine liver function tests and is more sensitive than other scoring systems (Sun W et al. 2016).

Transient Elastography (Fibroscan) is an imaging method that can measure liver hepatic elasticity and stiffness which provides a rapid, pain free noninvasive evaluation of the severity of fibrosis (Abd El Rihim et al. 2013; Kirk et al. 2009).. Kilopascal unit is used in expression of the stiffness measurement (Leroy and Kim, 2012).

Activation of the innate immune system plays a key role in the development of fatty liver disease (FLD). The complement system is a major humoral component of the innate immune response and complement C3 plays a central role, implying that C3 may be a powerful predictor or therapeutic target for FLD. Emerging evidence suggests that activation of the innate immune system contributes to FLD pathogenesis (Phieler et al. 2013). Complement proteins are produced mainly by liver (Naughton et al. 1996). Complement C3, a central molecule of the complement system has multiple roles in the liver including pro-inflammatory and regenerative functions and responding to exposure of toxins such as alcohol.

Complement system is increasingly recognized to be closely associated with obesity and related metabolic disorders and involved in NAFLD (Hertle et al. 2014). In an observational study conducted in Netherland, activation of complement system was observed in 74% of 43 NAFLD patients (Rensen et al. 2009). A recent relatively large population study in China also found that participants with higher serum complement C3 levels are more likely to have NAFLD than those with low C3 levels (Jia et al.

2015). However, whether the association between serum complement C3 level, FIB-4 index with stages of fibrosis of liver by Fibroscan remain uncertain in NAFLD patients.

The aim of this study was to see the relationship between serum complement C3 level and FIB-4 index with stages of fibrosis of liver by Fibroscan in NAFLD patients.

Methods:
This study was hospital based cross sectional study conducted inDepartment of Gastrointestinal Hepatobiliary and pancreatic disorders (GHPD) BIRDEM General Hospital, Dhaka, Bangladesh. Total hundred five of male and female patients with age >18 years having ultrasonographic evidence of fatty liver without alcohol use or occasional use (<30 gram alcohol per day in men and < 20 gram in women) attending at GHPD outpatient department of BIRDEM General Hospital, Dhaka, were included in this study by Purposive sampling technique from January 2016 to September, 2017. Following patients were excluded from the study--. Patients with chronic liver disease (eg: Hepatitis B and C, hemochromatosis, Wilson's disease, autoimmune disease etc), who take hepatotoxic drugs (eg. estrogens, amiodarone, methotrexate, tamoxifen, neucloside analogue) during the past 6 months, systemic comorbidities (eg. COPD, renal failure, cardiac failure), neoplastic disease, hypothyroidism, hypogonadism and polycystic ovarian syndrome, Patients with <18 and >70 years of age, unwilling to give voluntary consent to participate in the study, unwilling to collect bio samples, pregnancy and breastfeeding, diagnosis of liver cirrhosis and/or hepatocellular carcinoma, those with self-reported acute infection within 2 weeks.A standardized interview was conducted, all subjects were evaluated by history and extensive physical examination, blood samples were drawn from an antecubital vein from all participants. Serum complement C3 was measured by the nephalometric method by BN   ProSpec system. FIB 4 index were calculated from age, ALT, AST and total platelet count (TPC).Data were collected in a pre-designed data-sheet which contains questionnaire, clinical findings and biochemical and imaging findings. Statistical analyses were carried out by using the Statistical Package for Social Sciences version 16.0 for Windows (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as mean, standard deviation, and categorical variables as frequencies and percentages. Correlation between variables was measured by Spearman correlation coefficient test and Pearson correlation coefficient test. A p-value <0.05 was considered as significant.

Result:
An observational cross sectional study was carried out to evaluate the correlation of complement C3 and FIB4 Index with stages of fibrosis of liver by Fibroscan in NAFLD

subjects. Total 105 subjects of NAFLD, who fulfilled the inclusion criteria, were included in this study. The result of the study is presented in following tables and figures

Table I: Demographic and clinical characteristics of the study subjects (N=105)

	Values	Range(min-max)
Age in years	46.54±11.14	20-73
BMI (kg/m^2)	27.07±3.66	19.92-40.77
Waist Circumference(cm)	88.55±8.33	42.5-105
Systolic blood pressure (mmHg)	122.50±15.08	85-150
Diastolic blood pressure (mmHg)	77.00±9.62	60-100
Sex	Number of subjects	Percentage
Male	35	33.3
Female	70	66.7
Co-morbid illness		
DM	13	12.38
Dyslipidemia	7	6.67
DM+HTN	7	6.67
DM+Dyslipidemia	59	56.19
DM+HTN+Dyslipidemia	17	16.19
No co-morbid illness	2	1.90
Personal history		
Smoking	30	28.57
Physical findings in abdomen		
Hepatomegaly	12	11.43
Family h/o metabolic disorders	31	29.52

Results are expressed in mean±SD range, percentage

Table I shows demographic and clinical characteristics of study subjects and it was observed that the mean age was 46.54±11.14 with ranged from 20 to 73 years. The mean BMI was 27.07±3.66kg/m2 with ranged from 19.92 to 4077kg/m2. Mean systolic blood pressure (mm of Hg) was found 122.50±15.08 with ranged from 85-150 mm of Hg. Mean diastolic blood pressure (mm of Hg) was found 77.00±9.62 with ranged from 60-100 mm of Hg. Two third (66.67%) subjects were female. DM and Dyslipidemia were found in 59(56.19%) subjects. 30(28.57%) subjects had history of smoking. Hepatomegaly was found in 12(11.43%) subjects. there was family h/o metabolic disorders in 31(29.52%) subjects.

Table II: Distribution of study subjects by Occupation (n=105)

Occupation	Number of subjects	Percentage
House wife	57	54.28
Service holder	19	18.10
Business	12	11.43
Student	7	6.67
Retired	7	6.67
Farmer	2	1.90
Fisherman	1	0.95

Table II shows distribution of study subjects by occupation and it was observed that more than half (54.28%) subjects were house wife. followed by service holder 19(18.10%). And other results depicted in the above table.

Table III: Characteristics of study subjects by biochemical findings (N=105)

Liver function test	Values	Range(Min-Mix)
ALT (U/L)	76.73±51.04	14-259
AST(U/L)	60.62±54.68	10-402
Alkaline phosphatase (U/L)	118.40±31.22	56-210
GGT (U/L)	74.60±39.91	15-265
Blood sugar profile		
Fasting blood glucose (mmol/l)	9.11±3.63	4-6
2HABF (mmol/l)	13.25±4.95	5.7-32
HbA$_1$C%	9.60±1.98	4.03-15.03
Fasting serum lipid profile (mg/dl)		
Serum Cholesterol	200.60±54.16	114-345
TG	189.00±90.23	67-631
HDL	35.94±6.54	15-54
LDL	124.90±42.97	49-229
Serum Complement C3 (mg/dl)		
< 170	94	89.5
>170	11	10.5
Mean±SD	142.30±21.02	94.9-197
Total platelet count		
Mean±SD	272.2±76.93	100-589

Results are expressed in mean±SD range, percentage

Table III Shows distribution of study subjects by biochemical findings and it was observed that the mean ALT (U/L) was 60.62±54.68 with ranged from 14-259. Mean AST(U/L) was 60.62±54.68 with ranged from 10-402. Alkalinephosphatase (U/L) was 118.40±31.22 with ranged from 56-210. GGT (U/L) was 74.60±39.91 with ranged from 15-265. HbA1C% was 9.60±1.98 with ranged from 4.03-15.03. Serum Cholesterol was 200.60±54 with ranged from 114-345. TG was 189.00±90.23 with ranged from 67-631. HDL was 35.94±6.54 with ranged from 15-54. LDL was 124.90±42.97 with ranged from 49-229. Serum Complement C3 (mg/dl) was 142.30±21.02 with ranged from 94.9-197
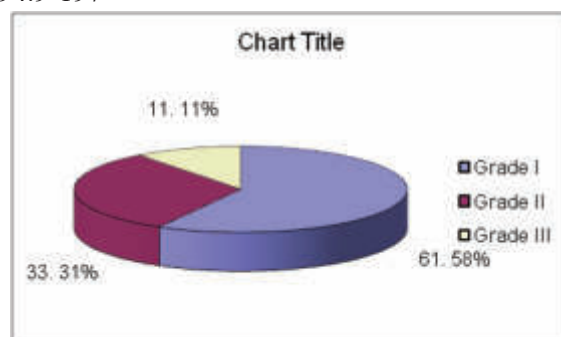
Figure 1: Distribution of study subjects by grading of fatty liver by USG of whole abdomen (N=105)

Figure I shows distribution of study subjects by grading of fatty liver by USG of whole abdomen and it was observed that 61(58.10%) subjects had grade I, 33(31.43%) had grade II, 11(10.48%) had grade III fatty liver.
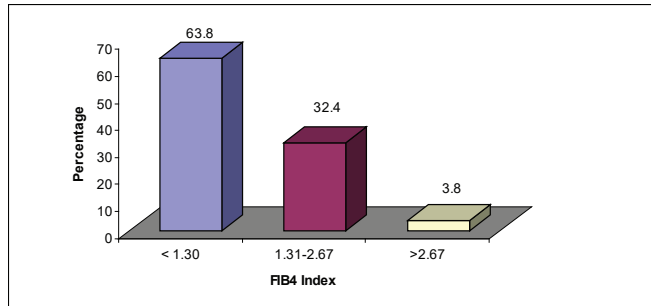
Figure 2: Distribution of study subjects by FIB4 Index (N=105)

Figure 2 shows distribution of study subjects by FIB4 Index and it was observed that 67(63.8%) subjects had FIB4 Index <1.30, 34(32.4%) had 1.31-2.67 and 4(3.8%) had >2.67. The mean FIB4 Index was found 1.22±0.76 with ranged from 0.27-4.46
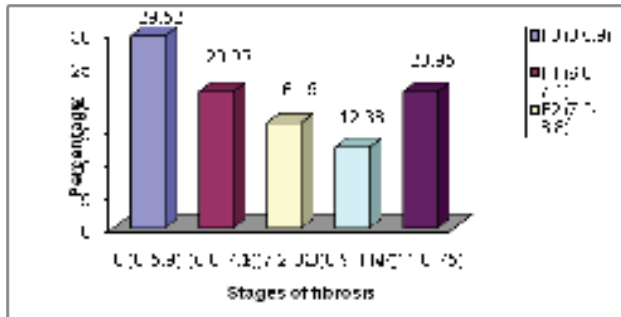
Figure 3: Distribution of study subjects by stages of fibrosis of liver by Fibroscan (N =105)

Figure 3 Shows distribution of study subjects by stages of fibrosis by Fibroscan. It was observed that 31(29.52%) subjects had fibrosis stage F0 followed by fibrosis stage F1 (20.95%) and 20(20.95%) subjects had fibrosis stage F4, 17(16.19%) had F2, 13(12.38%) had F3 stages offibrosis.

Table IV: Serum complement C3, FIB4 Index and USG grading analysis in multivariate logistic regression analysis for fibrosis stage by Fibroscan (n=105)

	B	S.E.	P value	OR	95% C.I.	
					Lower	Upper
Serum complement C3	-0.017	0.01	0.079[ns]	0.983	0.964	1.002
FIB4 Index	0.495	0.278	0.075[ns]	1.64	0.951	2.828
USG grading	0.113	0.301	0.707[ns]	1.12	0.621	2.019
Constant	1.41	1.467	0.336[ns]	4.095		

B-β error, S.E.-standard error, OR- odd ratio, CI-confidence interval

In multivariate logistic regression analysis, there is no significant association with stages of fibrosis by Fibroscan, serum complement C3, FIB4 Index and USG grading.
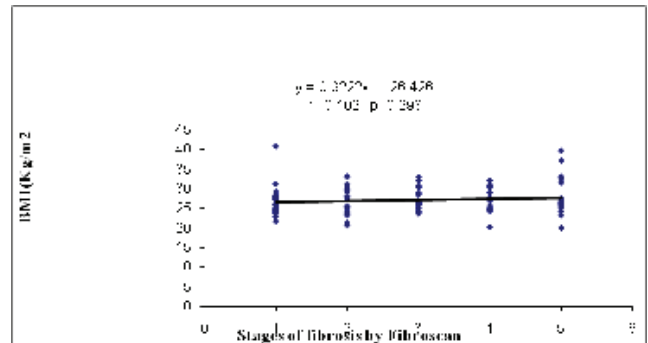
Figure 4: Scatter diagram showing positive correlation (r= 0.102; p=0.298) between BMI and stages of fibrosis by Fibroscan.(correlation was done by pearson's correlation test)
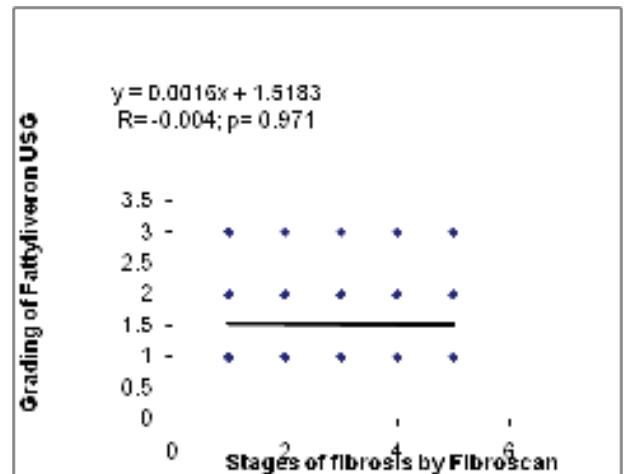
Figure 5: Scatter diagram showing no correlation (r= -0.004; p=0.971) between Grading of Fattyliver on USG and Stages of fibrosis by Fibroscan.(correlation was done by pearson's correlation test)
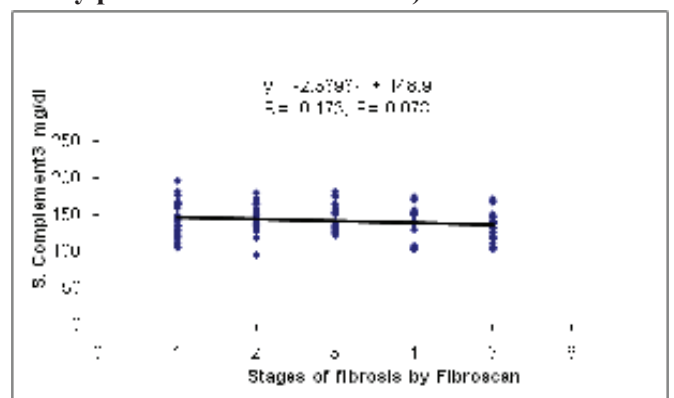
Figure 6: Scatter diagram showing negative weak correlation (r= -0.173; p=0.078) between Grading of Fatty liver on USG and stages of fibrosis by Fibroscan. (correlation was done by pearson's correlation test)
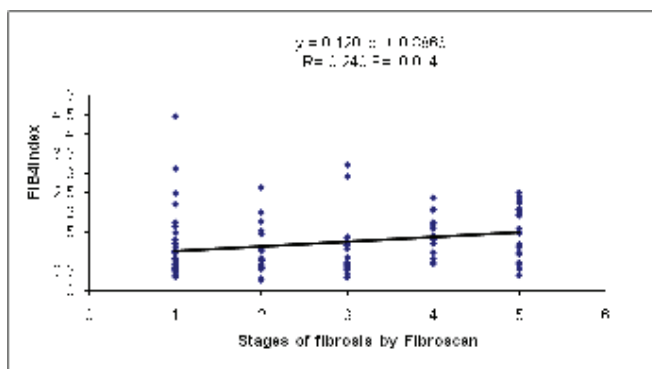
Figure 7: Scatter diagram showing significant positive correlation (r= 0.240; p=0.014) between FIB4 Index and stages of fibrosis by Fibroscan.(correlation was done by pearson's correlation test)

Discussion:
This observational and cross sectional study was carried out with an aim to see the correlation between serum complement C3 with severity of NAFLD and calculate FIB-4 index as a predictor of severity of NAFLD as well as to compare ultrasonographic grading of NAFLD with different stages of fibrosis of liver by Fibroscan and also to measure anthropometric data of NAFLD patients.

A total of 105 patients with NAFLD (Sonographically diagnosed) attending at OPD and admitted in Department of Gastrointestinal, Hepatobiliary and Pancreatic Disorders (GHPD) of BIRDEM General Hospital, Dhaka during January 2016 to October, 2017 were included in this study.

Regarding Demographic profile of the study Subjects it was observed that the mean age was 46.54±11.14 with ranged from 20 to 73 years. Jia et al. (2015) mentioned in their study that age may be related to the fact that the middle-aged and elderly subjects who participated in their study have a higher risk for metabolic disease and FLD.

In this current study it was observed that the mean BMI and waist circumference were 27.07±3.66kg/m2 and 88.55±8.333 cm respectively. The mean systolic blood pressure (mm of Hg) was 122.50±15.08 with mm of Hg and the mean diastolic blood pressure (mm of Hg) was found 77.00±9.62 mm of Hg. Xu et al. (2016) found the mean BMI and waist circumference were 25.67±2.7kg/m2 and 88.7±8.1 cm respectively. In this present study it was observed that most (66.7%) of the participant were female and male to female ratio was 1:2. In another study Xu et al. (2016) found that majority (78.4%) of the participant were male, 21.6% female and male to female ratio was 4:1.

About the co-morbid illness in this present study it was observed that DM with Dyslipidemia were more common (56.19%), history of smoking was 28.57%, Hepatomegaly

11.43% and there was a positive family h/o metabolic disorders 29.52% of the study subjects. Obesity and dyslipidemia are important risk factors for NAFLD. In a population-based studies in Japan and Korea, showed that obesity, dyslipidemia, and hypertension were independent risk factors for NAFLD (Tsuneto et al. 2010, Lee et al. 2007).

Regarding the liver function test it was observed in this present study that the mean ALT (U/L) was 76.73±51.04 with ranged from 14-259. Mean AST (U/L) was 60.62±54.68 with ranged from 10-402. Alkaline phosphatase (U/L) was 118.40±31.22 with ranged from 56-210. GGT (U/L) was 74.60±39.91 with ranged from 15-265 and HbA1C% was 9.60±1.98 with ranged from 4.03-15.03. Xu et al. (2016) found in their study Subjects with NAFLD had higher serum levels of alanine aminotransferase (ALT), aspartate aminotransferase (AST), γ-glutamyl transferase and fasting blood sugar Greevenbroek et al. (2011) study found that FLD and concomitant liver dysfunction (represented by alanine aminotransferase (ALT) levels), led to enhanced production of complement C3. In this current series it was observed that the mean serum Complement C3 was 142.30±21.02 with ranged from 94.9-197 mg/dl. Xu et al. (2016) found the median value of Serum Complement C3 was 126.0 mg/L with interquartile range (IQR) 117.0-1370 mg/L. In a small case-control study Yesilova et al. (2005) examining 46 NAFLD subjects showed C3 levels were significantly higher in NAFLD subjects

In this series it was observed that nearly two third (63.8%) subjects had FIB4 Index <1.30 followed by 32.4% belonged to 1.31-2.67 and 3.8% had >2.67 FIB4 Index. The mean FIB4 Index was found 1.22±0.76 varied from 0.27-4.46.

In this current study it was observed that stage F0 was more common (29.6%) followed by fibrosis stage F1 20.9%, F4 20.9% and, F2 16.19% and 12.38% had F3 stages of fibrosis. Similarly, Pathik et al. (2015) found 61.0% patients had fbrosis belonging to stage 1 and 2, while rest 39.0% had severe fbrosis or cirrhosis.

In another study Sun et al. (2016) observed a total of 135 patients, out of which 13.0% had advanced fibrosis (fibrosis stage 3 or 4), which is lesser with the current study

In this current study it was observed that serum complement C3, FIB4 Index and USG grading were not associated with stages of fibrosis of liver by fibroscan. However, in China Xu et al. (2016) study provided evidences for the first time that serum complement C3

level is independently associated with NAFLD in non-obese and metabolic syndrome free population, and the C3 levels are positively associated with severity of NAFLD. Their results suggested a significant role of complement C3 in NAFLD. The above difference may be due to their study performed among adult subjects who took their annual health examinations at ZhenhaiLianhua Hospital, China and most of their participants were older with compared to the present study subjects

Conclusion:
This study evaluated the correlation of serum complement C3 and FIB 4 index with stages of fibrosis of liver by Fibroscan in NAFLD patients. FIB 4 Index was positively correlated with stages of fibrosis of liver by Fibroscan and found statistically significant but there was weak negative correlation of serum complemement C3 with stages of fibrosis. FIB 4 Index can be used as a marker of severity of fibrosis in NAFLD patients.

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Original Article

Pattern of Bacterial Pathogens Isolated from Surgical Site Wound Infections and Their Antimicrobial Susceptibility in a Tertiary Care Hospital.

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Abstract:

Background: Resistant bacteria create a severe problem to susceptible drug especially in surgical wound infections, so it is necessary to find out the causative bacteria and their antimicrobial susceptibility pattern. **Objective:** To measure the sensitivity and resistant pattern of bacteria causing surgical site wound infection. **Methods:** This descriptive study was conducted in Sylhet MAG Osmani Medical College hospital from January, 2019 to December, 2019. The study was conducted on 35 surgical site infection patients of various age group. The sample was collected with sterile swab and inoculated on Blood Agar (BA) and Mac Conkey's Agar (MCA) media and incubated aerobically. Finally, the bacteria were identified based on characteristic morphological appearances of colonies on media. Then the antibiotic susceptibility pattern was done on Mueller–Hinton agar media according to CLSI guidelines using the Kirby–Bauer disk diffusion method. **Results:** Among 35 patients 20 (57.14%) were affected by surgical site wound infections. The most common type of bacteria isolated was Staphylococcus aureus 7 (31.82%) followed by Pseudomonas aeruginosa 4 (18.88%), Serratia marcescens 3 (13.64%) Escherichia coli 3 (13.64%), Proteus spp. 2 (9.09%), Acinetobacter spp. 1 (4.54%), Aeromonas spp. 1 (4.54%), Citrobacter spp. 1 (4.54%). **Conclusion:** The antimicrobial susceptibility data suggested that Gram positive bacteria are more susceptible to doxycycline, linezolid and levofloxacin; while Gram negative bacteria were more susceptible to imipenem, levofloxacin and meropenem.

Keyword: Surgical site wound infection, Antibiotic resistance.

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Introduction:

A skin or soft tissue infection may occur as a result of infection in surgical site, burns, trauma, diabetic wound infection etc. The infection that occurs at the surgical site after completion of surgery within 30 days is known as surgical site infection (SSI).[1] When it involves the skin only then it is known as superficial infection. Other surgical site infections are more serious and can involve tissues under the skin, organs or implanted material.[2]

Bacterial infections of wounds are one of the leading causes of morbidity and mortality throughout the world. Wound infections have been reported to vary between 3% to 11% in developed countries and estimated to be as high as 40% in developing countries.[3] It is estimated that 50% of wounds contaminated by bacteria become clinically infected.[4]

Staphylococcus aureus, Streptococcus pyogens, Escherichia coli, Pseudomonas aeruginosa, Klebsiella spp., Serratia spp., etc. are the most common organisms causing surgical site wound infections. The majority of the isolates from infected wounds are known to be resistant to various antibiotics. Infection in a wound, delay healing, prolongs duration of hospital stay, increases trauma, poses risk for disarticulation and amputation, increases need for medical care and increases treatment costs.[5] This makes surgical site wound infection a matter of concern for our health system and clears the necessity of studying the causative agents of these infections and their antibiogram.

Methods:

The clinical specimens for this study were collected from the selective patients admitted in Sylhet MAG Osmani Medical College Hospital (SOMCH), Sylhet over a period of one year from January, 2019 to December, 2019.

Characteristics of participants and enrolment procedures

Patients with SSI admitted in surgical ward who has got any kind of discharge from the surgical site within 30 days of surgery.

Sample collection and culture

Wound swabs were collected from patients with surgical site wound infection. Wound discharge was collected by swabbing at the middle of the wound with two separate swab sticks; one for microscopic slide preparation and the other for streaking in culture plates and transported to the laboratory within half an hour. The swab sticks were inoculated on Blood Agar (BA) and MacConkey Agar (MCA) media and incubated aerobically for 18–24 hours at 37°C. They were then observed for bacterial growth. Plates with no growth were re-incubated for another 24 hours for isolation of bacteria that require extended incubation.

Identification of bacterial pathogens

Standard techniques were applied for identification of bacteria, by characteristic morphological appearances of colonies on media, Gram stains and standard biochemical tests including catalase, coagulase, oxidase, hydrogen sulfide production, urease, methyl red, indole, citrate and sugar utilization.

Antibiotics susceptibility testing

Drug susceptibility tests were performed by using the Kirby–Bauer disk diffusion method according to Clinical and Laboratory Standards Institute (CLSI) guidelines.[6] A sterile swab was soaked into the suspension of the isolated bacteria in normal saline then squeezed free from excess fluid against the side of tube and spread over the Mueller–Hinton agar plate. The density of suspension was determined by comparison with the optical density of McFarland 0.5 Barium sulfate solution. Antibiotic disc of appropriate antibiotics were placed onto the media and incubated at 37°C for 16-18 hours. Zones of inhibition were read. Sensitive and resistance rates to respective antibiotics were determined.

Statistical analysis

Clinical, demographic and laboratory data were entered and linked for each patient using Statistical Package for Social Science software version 21 (IBM Corp, Chicago IL). Frequency and percentages were used to summarize categorical data.

Result:

A total of 35 patients had surgical site wound discharge among which 20 patients were tested positive for surgical site wound infection. Among them 50% were male and 50% were female. The patients were divided into several groups according to age and maximum patients belong to the age group 21-30 years.

Table-I: Distribution of patients according to age group.

Age group	Frequency	Percentage
11-20	3	13.6
21-30	12	54.5
31-40	5	22.7
61-70	1	4.5
71-80	1	4.5
Total	22	100

Among these culture positive cases only two revealed growths with more than one organism. 8 (36.4%) cases were treated with antibiotics preoperatively.

Table-II: Different bacteria isolated from the cultures with their frequency and percentage.

Bacteria	Frequency	Percentage
Staphylococcus aureus	7	31.82%
Pseudomonas aeruginosa	4	18.18%
Serratia marcescens	3	13.64%
Escherichia coli	3	13.64%
Proteus spp.	2	9.09%
Acinetobacter spp.	1	4.54%
Aeromonas spp.	1	4.54%
Citrobacter spp.	1	4.54%

Antibiotic susceptibility pattern showed that the most effective antibiotic for Gram-positive bacteria was Doxycycline, Linezolid and Levofloxacin and the least effective antibiotics for Gram-positive were Oxacillin and Erythromycin (Figure:1).
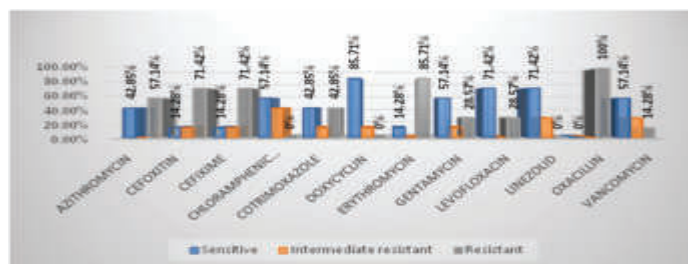
Fig. 1: Antibiotic susceptibility pattern of Gram-positive bacteria

For Pseudomonas aeruginosa the most effective antibiotic was Ciprofloxacin and Meropenem. For other Gram-negative bacteria like Escherichia coli, Serratia marcescens and Proteus spp., the most effective antibiotic was Gentamycin and Imipenem respectively (Table-III).

Table-III: Antibiotic resistance pattern of some Gram-negative bacteria

Antibiotics	*Pseudomonasaeruginosa*	*Escherichiacoli*	*Serratiamarcescens*	*Proteus* spp.
Amikacin	75%	-	-	-
Aztreonam	75%	66.67%	100%	100%
Ampicillin	-	100%	100%	100%
Ceftazidime	75%	33.33%	100%	100%
Cefepime	100%	66.67%	100%	100%
Ceftriaxone	-	33.33%	100%	50%
Cefixime	100%	-	66.67%	50%
Cefuroxime	75%	33.33%	-	100%
Cotrim	-	33.33%	66.67%	50%
Ciprofloxacin	25%	66.67%	66.67%	50%
Gentamycin	75%	0%	100%	0%
Levofloxacin	25%	33.33%	33.33%	0%
Imipenem	50%	33.33%	0%	0%
Meropenem	25%	-	33.33%	-
Nitrofurantoin	-	33.33%	-	-
Piperacillin-Tazobactam	75%	-	-	-

Citrobacter spp. was found in 1case. It was sensitive to imipenem, levofloxacin and aztreonam. It was resistant to ampicillin, ceftazidime, cefepime, ceftriaxone, cefixime, cefuroxime and trimethoprim-sulfamethoxazole.

Aeromonas spp. was sensitive to imipenem and meropenem and resistant to amikacin, aztreonam, ceftazidime, cefepime,cefixime, cefuroxime, ciprofloxacin, levofloxacin and piperacillin-tazobactam.

Acinetobacter spp. was found in 1 sample. It was resistant to ceftazidime, cefepime, ceftriaxone and doxycycline and sensitive to ampicillin, levofloxacin and trim. 1 (50%) were sensitive to ampicillin, levofloxacin and trimethoprim-sulfamethoxazole.

Discussion:
Present study aimed at describing the causative agent of surgical site wound infection in a tertiary care hospital of Bangladesh. Among 35 cases 20 (57.14%) were culture positive which was similar to a study conducted by Borse et al. (2015) in India.[7] They found 65.17% positive cases. Among 20 cases 50% were male and 50% were female. The patients were divided into several groups according to age and maximum patients belong to the age group 21-30 years. Out of 20 positive cases 31.81% were

Gram-positive organism and 68.19% cases were Gram-negative which is similar to a study conducted by Deshpande et al. in 2016 where they found 39.3% causative organism were Gram positive and 60.6% were Gram negative organisms.[8]

Staphylococcus aureus was found more prevalent in surgical site wound infection (31.82%) which is quite similar to a study performed by Khan et al. (2020) who found 24.2% cases positive for Staphylococcus aureus among 73 positive cases.[9] The patients particularly affected by Staphylococcus aureus are those who stays in hospital for prolonged periods, elderly or debilitated patients, those with open or closed wounds, burn and those who had recent treatment with antibiotics.[10] This might be due to its association with the endogenous source as the organism is a member of the skin and nasal flora of the patients, cross-contamination from the hospital environment, surgical instruments, or hands of the health professionals and due to nasal carriage of healthcare workers.[11] In this study, Staphylococcus aureus was found to be sensitive mostly to doxycycline (85.71%) followed by linezolid (71.42%), levofloxacin (71.42%), vancomycin (57.14%), azithromycin (42.85%) and mostly resistant to oxacillin (100%) followed by erythromycin (85.71%), cefoxitin (71.42%), and cefixime (71.42%). In another study Staphylococcus aureus was 100% sensitive to vancomycin, linezolid, tigecycline, 51.7% sensitive to levofloxacin from 1692 isolates.[12]

Another study showed doxycycline was 77.1% sensitive, azithromycin was 36.2% sensitive, chloramphenicol was 64.8% and cefixime was 84.8% resistant out of 105 cases which was similar to the present study.[13] In our study doxycycline was found to be the most sensitive antibiotic for S. aureus; it may be due to the less frequent use of doxycycline now-a-days.

The second most common organism responsible for surgical site wound infection was Pseudomonas aeruginosa (18.18%). A study conducted by Tolera et al. in 2018 found 17.6% cases were caused by Pseudomonas aeruginosa, which is similar to the present study.[11] It was mostly resistant to cefepime (100%), cefexime (100%), amikacin (75%), aztreonam (75%), ceftazidime (75%), cefuroxime (75%), gentamycin (75%) and piperacillin tazobactam (75%) and sensitive to levofloxacin, meropenem and ciprofloxacin. This is similar to another study conducted by Sharifi et al. where the resistance pattern was amikacin (60%), aztreonam (60%), gentamycin (61.25%) which is similar to this study and meropenem (62.5%), piperacillin-tazobactam (48.75%) and cefepime (63.75%) were dissimilar with present study.[14] Again, in another study directedby Deghan et al.

there was resistance to ceftazidime (60%), imipenem (21.4%) and was sensitive to ciprofloxacin (46.7%); quite similar to this study.[15]

E. coli was mostly resistant to ampicillin (100%) followed by aztreonam, cefepime, ciprofloxacin. S. marcescens was mostly sensitive to levofloxacin and meropenem while resistant to aztreonam, ampicillin, ceftazidime, gentamycin. From this discussion it can be said that Gram negative bacteria were more resistant to antibiotics specially cefepime, ampicillin, aztreonam. Gram positive bacteria were more resistant to oxacillin and erythromycin. The high rate of antibiotic resistance of isolated organisms in this study might be due to widespread use of antibiotics in our hospitals. Again, the antibiotics are being prescribed empirically; without checking the culture and sensitivity test. For this reason, new strains of microorganism are being generated which are more resistant to antibiotics.

Study limitations:
Despite of being very careful, there were certain limitations like the sample size was small; the study was conducted in a single hospital, so the study population might not represent the whole community. The sample size was taken purposively, so there may be chance of biasness which may influence the result.

Conclusion:
Gram negative organisms with multiple drug resistance were commonly associated with postoperative surgical site infection. Rationale antimicrobial use and continuing surveillance of bacterial antimicrobial sensitivity tests at local level can be potential to reduce emergence and spread of resistant bacteria isolates.

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Original Article

Association Between Hyponatremia and Febrile Seizure

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Abstract:

Background: Febrile Seizure is one of the most common problems in children. It is the seizure occurring in children between the age of 6 and 60 months. Most febrile seizure are simple but 30 percent have complex febrile seizure. The risk of recurrence of febrile seizure is related to various factors. hyponatremia causes neuronal excitability and seizure. **Objective:** To see the effect of hyponatremia in children with febrile seizure. **Methods:** The case control study was carried out in the department of pediatrics Comilla Medical College Hospital from January 2021 to June 2021. Study population was children with febrile seizure with some inclusion and exclusion criteria. Sample size was fifty. Fever but no seizure in the same age group was taken as control. A thorough history, complete clinical examination and relevant investigation including serum electrolytes were done. After compiling all the data are analyzed statistically. **Result:** Among the 50 cases male female ratio was 1.4:1, 6% of the population have family history of febrile seizure. Common age group among the patient was 13-24 months. Hyponatremia was found 14% of the febrile seizure patient and 6% in control group. p value 0.192. Hyponatremia was found 15% in 1st febrile seizure. 9.1% in recurrent seizure patient p value 0.595. Among the case group Hyponatremia was found 13% with simple febrile seizure and 25% patient with complex febrile seizure with p value 0.509. **Conclusion:** There is weak association between hyponatremia and incidence of febrile seizure and also is recurrence. So routine measurement of serum sodium is not required in case of febrile seizure.

Keywords: Hyponatremia, Febrile Seizure.

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Introduction:

Febrile seizure are one of the most common problems encountered in clinical pediatric practice. The American academy of pediatrics (AAP) has encountered a standard definition of febrile seizure as a seizure occurring in febrile children between the age of 6 and 60 months who do not have an intracranial infection, metabolic disturbances or history of febrile seizure[1]. Though the age range of febrile seizure is 6 to 60 months, the peak incidence is usually is the second year of life. Febrile seizure are prevalent in up to 5 percent of the children, with overall incidence estimated to be 460/100000 in the age group of 0-4 years[2]. A simple febrile seizure is a primary generalized seizure usually tonic clonic attack associated with fever, lasting for a maximum of 15 minutes and recurrent within a 24 hours period, febrile seizure that continues longer than 30 minutes is classified as febrile status epilepticus[1].

Most of the cases of febrile seizure are simple, however up to 30% might have some complex features[3]. Younger age group, prolonged seizure duration, degree of fever and positive family history of febrile seizure are the risk factor for recurrence[4]. Febrile seizure recur in approximately 30% of those experiencing a first episode, in 50% after two or more episodes[1]. There are some seasonal variations like febrile seizure tends to occur more in winter months and more common in evening[5]. Currently we know that there is a large role of genetic susceptibility based on a large group of gene variants. This genetic makeup has likely resulted

in neurodevelopment vulnerability, with alteration in sodium channel expression, hypothalamic dysregulation and both cortical and hippocampal excitability[6]. Though there is no single accepted mechanism but there is a variable genetic inheritance pattern. In 25% to 40% cases a positive family history of febrile of febrile seizure can be found in children with febrile seizure[7,8,9].

Gene associated with febrile seizure include SCN1A, SCN1B, SCN9A and CPA6(1). In terms of other etiologies a dysregulation between proinflammatory and anti inflammatory cytokines has been associated with febrile seizure. There are two phases in seizure, one is initiation phase and another is propagation phase[10]. High frequency bursts of action potential and hyper synchronization are the two concurrent events in an aggregates of neurons occurs in initiation phase[11].

Due to influx of extra cellular calcium which leads to opening of voltage depended sodium channels that leads to an influx of sodium which produces long lasting depolarization of the neuronal membrane and causes bursting activity[9]. In the case of hyponatremia due to deficiency of sodium ion, more calcium ion influx and generation of repetitive action potential which will cause repetitive seizure initiation. It is thought that hypo natremia in predisposed subjects lower the threshold for neuromuscular excitability and seizure recurrence. This hyponatremia may be due to syndrome of inappropriate hormone. Hyponatremia enhances the susceptibility to seizure associated with febrile illness in childhood[11,12,13,14].

Methods:
This case control study was carried out in the department of pediatrics, Comilla Medical College Hospital, Cumilla from January 2021 to June 2021 for a period of six months. Study Population was children with febrile seizure with some inclusion and exclusion criteria. Purposive sampling was performed and sample size was fifty. Inclusion criteria: (1) Age between 6-60 months, (2) Children present with fever with seizure. Exclusion criteria: (1) Children with unprovoked seizure (2) Children with sign of meningitis (3) Children with developmental delay (4) Children with neurological disorder. Fever but no seizure in the same age group was taken as control.

Study procedure: Written consent was taken from all respondents. A thorough history was taken after stabilizing the patients. History includes age, sex, age of onset of seizure. Family history of febrile seizure and type of febrile seizure. A complete clinical examination was done in all cases and control group. Samples were collected for complete blood count (CBC), urine routine examination. chest x ray. CSF study and serum electrolytes. Data were collected using a structured questionnaire containing all the variables. Data processing work consisted of editing, coding and computerization, preparation of tables, analysis and matching data. All the data were compiled and edited meticulously.

Data analysis and interpretation: Computer based statistical analysis were carried out with appropriate techniques and system. Quantitative data were expressed as mean and standard deviation and qualitative data were expressed as frequency distribution and percentage. Statistical analysis was performed by using window based computer software devise with statistical package for social science (SPSS22). Chi square test was done to see the association. Odd ratio was done to see the strength of association.

Ethical consideration: The ethical issues were addressed duly by informed written consent of parents/guardians of each patient before enrolment and taking permission of ethical committee of Comilla Medical College.

Result:
There were 50 cases and 50 control group in our study.

Table-I: Gender distribution of Febrile Seizure (n=50)

Gender	Case (n=50)
Boys	29 (58.0)
Girls	21(42.0)

Table I shows among the case group 29 (58%) boy and 21(42%) girls. The boys and girls ratio was 1.4:1.

Table-II: Distribution of case (n=50) and control (n=50) group by age

Age (months)	Case (n=50)	Control (n=50)
6-12	17 (34.0)	20(40.0)
13-24	20(40.0)	16(32.0)
25-36	8(16.0)	2(4.0)
37-48	3(6.0)	4(8.0)
49-60	2(4.0)	8(16.0)
Mean ± SD	20.98± 13.56	24.08± 12.96

Table II Shows Age of case control group. Common age group of febrile seizure patient is 13-24 months and number of the case was 20(40%). Common age of control group was 13-24 months and number of control group was 16(32%). Mean ± SD of case and control group were 20.98± 13.56 and 24.08± 12.96 months respectively.

Table-III: History (n=50)

	Freq (n=50)	Percentage
Family H/O febrile seizure	3	6.0
H/O status epilepticus	4	8.0

Table III shows Family H/O febrile Seizure was found 3(6%) cases and H/O status epilepticus was found 4(8%).

Table-IV: Association of serum sodium with febrile seizure

	febrile seizure (n=50)	Control (n=50)	p value
Hyponetremia	7(14.0)	3(6.0)	0.192
normonatremia	43(86.0)	47(94.0)	

Table IV shows hyponetremia was found 7(14%) in febrile seizure patient and 3(6%) in control group. Serum sodium level was normal in 43(86%) febrile seizure patient and 47(94%) in control group p value 0.192.

Table-V: Association of serum sodium with number of seizure (n=50)

	First seizure (n=29)	Recurrence (n=11)	p value
Hyponatremia	6(15.4)	1(9.1)	0.595
Normonatremia	33(84.6)	10(90.9)	

Table V shows hyponatremia was fount 6(15.4%) in first seizure patient and 1(9.1%) in recurrent seizure patient. Normonatremia was found 33(84.6%) in first seizure and 10(90.9%) in recurrent seizure patient.

Table-VI: Association of serum sodium with type of seizure (n=50)

	Simple (n=46)	Complex (n=4)	p value
Hyponatremia	6(13.0)	1(25.0)	0.509
Normonatremia	40(87.0)	3(75.0)	

Table VI shows Hyponatremia was found 6(13%) patient with simple febrile seizure and 1(25%) patient with complex febrile seizure where as normonatremia was found in 40(87%) patient with simple febrile seizure and 3(75%) patient complex febrile seizure p value 0.509.

Discussion:

The main objective of the study is to see the effect of hyponatremia in febrile seizure. From demographic characteristics in our study boys are more commonly affected and male female ratio is 1.4:1, which agreed with kulandaivel M[15]. The current study shows common age was <2years (40%) which agree kulandaivel M Study[15]. In our study 6% of the febrile seizure patient have positive family history where as Frantzen E et al showed 25% positive family history[7]. This may be due to their large sample size. In our study hyponatremia (S Na+<135mmol/L) was found 14% of the febrile seizure patient and 6% of the control group which is not statistically significant. This is opposite the results of others studies[16,17]. This difference in observation may be due to fact that there control group consisted of children with a febrile seizure and not febrile children without seizure as was ours. In our study total 11 (22%) out of 50 children developed recurrent seizure while Youssof et al[18] showed 25% developed recurrent seizure which consisted with our study. In ours study hyponatremia was found 9.1% of the recurrent seizure patient and 15.4% of the simple febrile seizure patient which is not significant. This feature is supported by Thoman JE[16] and Hayderian F[17]. Hugen CA et al[18] and Kirivanta T et al[19] showed there was statistically significant deference in serum sodium level of children with recurrent febrile seizure as compared to children with single febrile seizure which did not support our study. Differences in the number of patient included these studies along with specific genetic predisposition can be the cause of such differences as the number of patient included in their studies were larger than ours. In our study hyponatremia was found in 13% of the patient with simple febrile seizure and 25% of the complex febrile seizure which is not statistically significant. This does not agree with dein KK et al[20] which showed 20% and 46.7% respectively. This differences may be due to our smaller sample size and shorter period of study.

Conclusion:

The weakness of the association between serum sodium changes and incidence of febrile seizure suggest that alteration of serum sodium is unlikely to play a clinically significant role in causing seizure or its recurrence in patient with febrile seizure. Therefore routine measurement of serum electrolytes is not required in this group of children. So we recommend evaluation of serum sodium based on predisposing factors and clinical sign and symptoms.

Limitation of the study:

We exclude some patient who had a strong risk factors for hyponatremia like meningitis, head trauma. Our sample size was small and it was conducted in a single centre.

Recommendation:

Large scale and multi center studies are required to get a positive association.

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Original Article

Association Between Prolong Preoperative Hospital Stay and the Development of Surgical Site Infection- A Study of 200 Cases in Comilla Medical College Hospital

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Abstract:

Background: SSI is a serious complication of surgery resulting in increased length of hospital stay as well as higher costs. This study is an attempt to determine the effect of preoperative hospital stay on the development of SSI. **Methods:** A Prospective cohort study was conducted on 200 patients who underwent elective clean and clean contaminated surgery. They were divided into three groups according to length of preoperative hospital stay as group A (0-3 days), group B (4-8 days) and group C (>8 days). Then post-operative wound infections were assessed by ASEPSIS score and statistically compared in these three groups. Results: SSI rate was 5.3% in group-A, 7.1% in group-B and 24.5% in group-C which was higher in group-C compared to group-A and group-B (p value 0.047). The overall rate of wound infection was 16%. SSI was found significantly higher in patients with urinary catheter (p 0.012), surgical drain (p 0.003) and where blood transfusions were made (p 0.0001). E coli was found as predominant organism (25%) from wound swab culture. **Conclusion:** SSI is significantly higher in patients with long preoperative hospital stay in elective surgical operation.

Keywords: SSI (Surgical site infection), preoperative hospital stay, ASEPSIS score

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Introduction:

Until the introduction of aseptic surgery in the middle of the 19th century, most wounds became infected resulting in a mortality rate of 70-80% in deeper infections. Since then a number of advancements, particularly in the field of microbiology, have made surgery safer. However, the overall incidence of healthcare associated infections remains high and represents a substantial burden of disease[1]. Surgical site infection (SSI) is defined as an infection that occurs within 30 days after a surgical operation (or within one year if an implant is left in place after the procedure) and affects either the incision or deep tissue at the operation site[2]. It is further divided into superficial SSI (involves only skin and subcutaneous tissue of incision), deep incisional SSI (involves deep tissues e.g. facial and muscle layers and/or superficial infection) and organ/space SSI (involves any part of the anatomy in organs and spaces other than the incision, which was opened or manipulated during operation).

Though most SSI are superficial, they contribute greatly to the surgery related morbidity and mortality. A review of the incidence and economic burden of SSI in Europe estimated that the mean length of extended stay attributable to SSI was 9.8 days, at an average cost of 32.5 USD per day[1].

It is generally accepted that SSI contribute significantly to the morbidity and mortality associated with surgical procedures[3]. A long-term study by the Inter-regional Co-ordination Centre for Nosocomial Infection Control (INCISO) Network Study group reported that over a 3 year period, 38% of the deaths that occurred in patients with SSI were directly attributable to the infection[4]. A patient who develops SSI is more likely to have an extended length of

stay[5], incurring increased financial burden in terms of bed occupancy, physician time, nursing care and diagnostic and therapeutic interventions.

SSI accounts for a high proportion of the total number of hospital-acquired infections[3] Pathogens causing SSI differ according to the type of operation, the surgical site, epidemiologic factors, and local ecology[6]. SSI are primarily caused by gram-positive organisms from the patient's own flora, found on the skin, mucous membrane, or hollow viscera during surgical procedures[7,8]. However, other organisms can be introduced from inadequately sterilized or contaminated surgical instruments, contaminated traumatic injuries, or the operating room environment, or because of poor surgical technique[9].

The type of procedure is a risk factor. Certain procedures are associated with a higher risk of wound contamination than others. According to the US National Nosocomial Infection Surveillance (NNIS) system hospitals infection rates in the four surgical classifications (clean, clean-contaminated. contaminated and dirty wounds) were reported to be: clean 2.1%, clean-contaminated 3.3%, contaminated 6.4% and dirty 7.1%. There is, however, considerable variation in each class according to the type of surgery being performed[1,8]. The risk factors for hospital-acquired infections also include parenteral nutrition, use of invasive devices, poor postoperative status and immunodeficiency[10]. Other risk factors that increase the opportunity for to acquire infections are: prolonged preoperative hospital stay, severity of illness, use of indwelling catheters, failure of health care workers to wash their hands between patients of before procedures, prevalence of antibiotic-resistant bacteria from antibiotic overuse[11]. Furthermore any type of invasive procedure can expose a patient to the possibility of infection e.g. urinary bladder catheterization, intubation or mechanical ventilation, surgery and the dressing or drainage of surgical wounds[12]. There are a lot of studies on hospital acquired infection worldwide. But very limited numbers of studies are found regarding preoperative hospital stay and its effect on postoperative wound infection. As per different journals and publications it is recommended that preoperative prolong hospital stay is one of the various causative factors for the development of post- operative SSI. In our country actually no study is available regarding this topic. That is why this prospective observational study is designed to determine the effect of prolong preoperative hospital stay on the development of SSI.

Methods:

A Prospective cohort study was conducted in the Department of Surgery, Cumilla Medical College Hospital between 1st January 2018 to 31st December 2019. By Consecutive, convenient and exhaustive sampling a total of 200 patients of both sex, aged 18 years and above who underwent clean and clean contaminated elective surgery were included. Patients undergoing re operation, failing to come for follow-up of upto 30 days since the day of operation, having corticosteroids or chemoradiation, operated for malignancies & patient with tuberculosis, jaundice, uraemia or DM were excluded from the study. Sample size was calculated using Fruchter and Guilford formula considering 5 % level of significance, 5% precision level (marginal error) and overall frequency of SSI of 7% in clean, clean contaminated wound (Haridas an Malangoni 2008)[13,14]. Informed written consent was obtained from the patients after full explanation of the details of the purpose of the study with their right to withdraw from the study at any stage. All the patients were assessed from history. physical examination and necessary investigations especially for co-morbidities, e.g. tuberculosis, diabetes, liver disease, renal disease and other immuno-compromised disorders. All subjects were grouped into three categories depending on the duration of preoperative hospital stay. Group "A" was patients with preoperative hospital stay for 0-3 days, group 'B' for 4-8 days and group 'C' for> 8 days. Wound was examined on 3rd to 7th postoperative day and any signs of wound infection was classified on the basis of ASEPSIS scores[15]. Collection of swab (if discharge present) was taken and was sent for bacteriological culture and sensitivity test. During discharge from the hospital the patients were advised for follow up after 4 weeks and the wound infection and wound dehiscence were recorded. Data was collected by a structured questionnaire and processed and analyzed by SPSS version 17.0, Quantitative data were analyzed by mean and standard deviation and qualitative data were analyzed by frequency and percentage. Comparison was done by chi-square12 test and unpaired t-test. Risk factors were determined using odd Ration. A Probability (p) value of <0.05 (p<0.05) were considered statistically significant and P< 0.001 were considered highly significant.

Results:

A total of 200 patients were included in the study. With 102(51%) male and 98 (49%) female. The overall rate of SSI was 16% (32 patients). 14(13.73%) male patients developed SSI while the rate was 18.37% (18) for females. The sex difference was insignificant (p=0.927). 88 patients underwent clean elective surgery among with 8(9.1%) developing SSI while 112 patients underwent clean surgery with 21.4% (24) rate of SSI (p value 0.095).

All patents were divided into three groups according to their preoperative hospital stay. Group 'A' comprised of 38 (19%) patients with preoperative hospital stay for 0-3 days

group 'B' (4-8 days) comprised of 56 (28%) and group 'C' (> 8 days) comprised of 106 (53%) patients respectively. Postoperative wound infection rate was 5.3%, 7.1%, 24.5% for group-A,B and C consecutively (Figure 1). Postoperative wound infection rate was significantly higher on prolong preoperative stay group (p-value 0.047, odds ratio 1, 1.38, 5.85).

Table I: distribution of wound infection by preoperative stay group
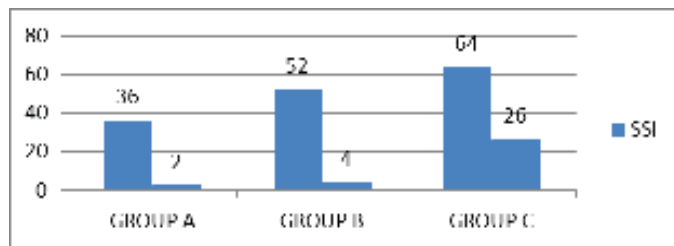
Mean ASEPSIS Score for group-A,B and C were 12.11(SD 6.94),14.46 (SD 6.24) and 17.74 (SD 11.58) consecutively. ASEPSIS Score was significantly higher (p-Value 0.018) on prolong preoperative stay group

Table II: Distribution of Preoperative stay group according to Mean ASEPSIS Score

Preoperative stay group	Group A (0 - 3) days	Group b (4-8) days	Group c (>8) days	p-value
Mean ASEPSIS Scores	12.11	14.46	17.74	0.018
Standard deviation	6.94	6.24	11.58	
Range	10-25	10-40	10-55	

*Chi-square test was applied to analyze the data

Mean length of postoperative hospital stay was 12.25 (SD ± 4.31) days for patients who developed SSI in contrast to 7.88 (SD ±1.92) days for patients without SSI making the former significantly higher

Table III: Effect of wound infection or postoperative stay

Wound infection	Number of patients	Range (days)	Mean postoperative stay (day)
No	168	7-9	7.88 (SD±1.92)
Yes	32	7.17	12.25 (SD±4.31)

The rate of wound infections varied in different type of surgeries as are shown in

Table IV: Distribution of infections according to types of operations

Name of the operation	Total	0-3 days Wound infection No	0-3 days Wound infection Yes	4-8 days Wound infection No	4-8 days Wound infection Yes	>8 days Wound infection No	>8 days Wound infection Yes
Cholystectomy	30	8	0	8	2	10	2
Choledocholithotomy	20	0	0	6	0	10	4
Herniorrhaphy for Inguinal hernia	40	16	2	10	0	10	2
Hernioplasty of Inguinal Hernia	14	2	0	6	0	4	2
Hernioplasty of Epigastric Hernia	8	2	0	2	0	4	0
Hernioplasty of Incisional hernia	10	2	0	2	0	4	2
Nephrolithotomy	14	2	0	4	2	4	2
Ureterolithotomy	10	0	0	2	0	6	2
Gastrojejunostomy	16	0	0	2	0	10	4
Appendicectomy(Elective)	10	2	0	2	0	4	2
Laparotomy with adhesionolysis	4	0	0	0	0	2	2
Ileostomy closer	8	0	0	2	0	4	2
Excision and Eversion of Sec	16	2	0	6	0	8	0

28 (25%) out of 102patients who had urinary catheter developed SSI which was much lower when not used (4.26%). Postoperative wound infection rate was 25% when urinary catheter was used during operation and only 4.26% when catheter was not used.

Table V: Wound infection in different invasive procedure

Procedures		Total	Wound infection No	Wound infection Yes	p-value
Urinary catheter	Used	112	84(75%)	28(25%)	0.0126
	Not used	88	84(95.74%)	4(4.26%)	
Blood transfusion	Made	62	38(61.29%)	24(38.71%)	0.001
	Not Made	138	130(94.20%)	8(5.80%)	
Surgical drain	Used	90	64(71.11%)	26(28.89%)	0.003
	Not Used	110	104(94.54%)	6(5.46%)	

Total 32 patients (16%) have postoperative wound infection among which 10 patients (31.25%) had no growth of organism on wound swab, 8 (25%) had E coli, 6 (18.75%) had staphylococcus aureus, 6 (18.75%) had pseudomonas and 1 (6.25%) had predominantly proteus cultured from their wound swab.

Discussion:

In this study a total of 200 patients were included. 19% patients stayed 0 to 3 days (Group A) preoperatively, 28% patients stayed 4 to 8 days preoperatively (Group B) and 53% patients stayed > 8 days preoperatively (Group C). There were 102 male and 98 female. Among male 13.73% developed postoperative wound infection, which was 18.37% for female showing no statistical significant difference (p=0.927). This finding is contrast to AhmedM et al10 who reported the incidence of wound infection to be more in male patients (11.5%) as compared to female patients (10.4%).

In current study total 44% of the patients underwent clean elective surgery among which 9.1% have developed

postoperative wound infection. 56% of the patients underwent clean contaminated surgery and infection rate was 21.4%. Wound infection is not statistically significant (p. value 0.095) between clean and clean contaminated surgery. SP Lailani et al16 also found similar result of wound infection for clean contaminated cases (22.41%) but their infection rate was lower (3.03 %) than present study for clean surgery.

In our study, infection rate was found to be 16% for clean and clean contaminated surgery. In group-A 94.7% had no infection and 5.3% with postoperative wound infection. In group-B 92.9% had no wound infection and 7.1% with postoperative wound infection. In group-C 75.5% had no wound infection while 24.5 % developed postoperative wound infection. The rates of postoperative wound infection is higher in prolong preoperative stay group compared to short preoperative stay group which is statistically significant (p value 0.047). This study results correlate PS Ganguly et al17. They found minimum wound infection when preoperative hospital stay <7 days and maximum when preoperative stay more than two weeks.

Mean length of postoperative hospital stay was 12.25 (SD ± 4.31) days for patients who developed SSI in contrast to 7.88 (SD ±1.92) days for patients without SSI making the former significantly higher. In this study mean ASEPSIS Score for group-A, group-B and group-C was 12.11, 14.46 and 17.74 respectively, which was significantly higher (p-Value0.018) preoperative stay group. on prolong Postoperative wound infection rate was 25% when urinary catheter was used during operation and only 4.26 % when catheter was not used. Infection rate was 38.71% when blood transfusion was made and only 5.80% when blood transfusion was not made. 28.89% developed postoperative wound infection who had surgical drain during operation which is 5.4% only for whom drain was not used. All these instances had statistically significant relationship for development of post operative wound infection.

Out of the patients who developed SSI 31.25% no growth organism on wound swab culture while 25% had coli, 18.75% staphylococcus aureus, 18.75% had pseudomonas and 6.25% had proteus. This report similar to that reported by Zaman et al18. Ashraf al19. found in wound infection E coli (37. 5%) was predominant organism followed staphylococcus aureus (21.7%). Mesaadeh et al20.reported the most causative agent of infection P.auriginosa followed by coli. MS Alam et al[21] found than in wound infection E coli 25% and staphylococcus aureus 18.75% Bertrand al[22] documented 19.1% P.auriginosa, These differences might be due different sample size or different in sample selection procedure. The variation of organisms in different studies in the same or in the different localities over time might be explained by the fact that antibiotics had changed the organism in deferent localities

Conclusion:
Throughout the world, nosocomial infections are considered hindrance in medical and surgical practices. Possible to reduce the rate of surgical infection if proper attention is given before after, and during operation. The rate of postoperative infections was significantly in patients with prolong preoperative hospital particularly in those who stayed more than 8 days in the hospital prior to surgery. Considering the findings the study preoperative hospital stay for elective surgery should minimum as possible. Randomized comparative study on preoperative hospital stay involving multicenter and large smaple size shoud be carried out to get the bigger picture

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Original Article

Antimicrobial Susceptibility Profile of Group B Streptococcus Isolates from Pregnant Women of 35-37 Weeks

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Abstract:

Background: Group B Streptococcus (GBS) colonization of mother during pregnancy is an important risk factor for early onset neonatal sepsis (EONS). Use of prophylactic intrapartum antibiotics in colonized mother, is associated with reduced early onset disease (EOD) in neonates. **Objectives:** The aim of this study was to determine the antimicrobial susceptibility profile of GBS among pregnant women at 35–37 weeks. **Methods:** A cross sectional analytical study was conducted from July 2018 to June 2019 at the department of Microbiology of Sir Salimullah Medical College, Dhaka. Total 107 of each vaginal and vaginorectal swabs was collected from pregnant women at 35-37 weeks of pregnancy attending at the out-patient department of the Obstetrics and Gynaecology unit of Sir Salimullah Medical College and Mitford Hospital, Dhaka. Vaginal and vaginorectal samples were tested by standard culture technique using Todd-Hewitt broth, blood agar media. All GBS isolates were subjected to antimicrobial susceptibility testing by disc diffusion method. Data was collected by a questionnaire and results were analyzed by statistical package for the social sciences (SPSS) program. **Result:** Among 107 study population 11(10.28%) were identified as GBS carriers. All (100%) isolates were sensitive to penicillin, ampicillin, ceftriaxone, cefepime and vancomycin. While 9.09%, 27.27% and 36.36%, isolates were resistant to clindamycin, erythromycin and chloramphenicol respectively. **Conclusion:** Total 10.28% pregnant women were identified as GBS carriers. The sensitivity of GBS was 100% for penicillin, ampicillin, ceftriaxone, cefipime and vancomycin. Penicillin or ampicillin is still the antibiotic of choice for intrapartum prophylaxis.

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Introduction:

Group B Streptococcus (GBS; Streptococcus agalactiae), exist as part of the normal microbiota in the female genital tract and anal areas of healthy adults in up to 30% cases.[1] The gastrointestinal tract serves as the natural reservoir for GBS and is the likely source of vaginal or rectal colonization.[2] Maternal GBS colonization is associated with premature rupture of membrane (PROM), preterm labor, intrauterine fetal death and complications such as chorioamnionitis, endometritis, cystitis, pyelonephritis and febrile GBS bacteraemia.[3,4]

Pregnant women who are carriers of GBS have 40-73% potential capacity for vertical transmission of the microorganism and 1-2% of their newborns develop invasive GBS infection like neonatal sepsis and meningitiswith significant mortality (5-20%) and morbidity, especially among premature neonates.[3,5]

In neonates, GBS is responsible for both early-onset disease (EOD) and late-onset disease (LOD). EOD is caused by vertical transmission of GBS from a colonized mother.[6] In contrast to EOD, LOS is due to vertical, horizontal or nosocomial infection.[7,8]

In many places like USA, intrapartumprophylactic antibiotics have been shown to reduce EOD, but resources are scarce in developing nations which constrained and prevented its implementation.[9] In 1996, the Centers for

Disease Control and Prevention (CDC) released consensus guidelines for neonatal GBS disease prevention. In 2002 and 2010, these guidelines were updated. All pregnant women between 35 and 37 weeks of pregnancy should be screened for vaginal and/or rectal colonization with GBS, according to the new guidelines. The most common approach for preventing GBS transmission from colonized mothers to their infants during labor is to give intravenous penicillin every four hours.[2]

Penicillin susceptibility is high in almost all GBS isolates.[10] However, there are some concerning instances of GBS patients with diminished penicillin susceptibility.[11] Alternative antibiotics, such as clindamycin, erythromycin, or vancomycin, can be given to pregnant women who are allergic to penicillin.[2] In different parts of the world, higher incidences of clindamycin and erythromycin resistance have also been recorded.[12]

Therefore, having a regional knowledge of the GBS resistance profile will aid in the administration of appropriate antibiotics in pregnant women for prophylaxis. The goal of this study was to investigate the antibiotic susceptibility pattern of GBS isolates in order to decide the most effective intrapartum prophylactic antibiotic therapy.

Methods:

This Cross sectional analytical study was conducted from July 2018 to June 2019 in the department of Microbiology, Sir Salimullah Medical College, Dhaka.Study population included pregnant women of 35-37 weeks attending at the out-patient department of the Obstetrics and Gynaecology unit of Sir Salimullah Medical College and Mitford Hospital, Dhaka. Those excluded from the study were: Pregnant woman of <35 weeks and >37 weeks of gestation, rupture of membrane at the time of sample collection, pregnant women with per vaginal bleeding at the time of sample collection, patient under antimicrobial therapy or history of intake of antibiotics during the past 2 weeks, preexisting medical disorders complicating pregnancy, women with urinary tract infection or vaginal infection in the current pregnancy and patients who did not give consent for this study. In this study, 214 samples (one sample from the vagina and one sample from the vaginorectal) were taken from 107 women at 35-37 weeks of pregnancy. A questionnaire and a check list were the tools of data collection. Informed written consent was taken from each patient or attendant. Before collecting specimen, each patient was interviewed and relevant information was recorded systematically in a pre-designed standard data sheet. The study was approved by protocol approval committee and Ethical review committee of Sir Salimullah Medical College, Dhaka.

The swabs were inoculated into Todd-Hewitt broth media. The Inoculated Todd-Hewitt broth was incubated for 18–24 hours at 37°C. Then subculture was done into Blood Agar media. Blood Agar media was incubated for 18–24 hours at 37°C with 5% CO_2 (by using a candle jar, 5% CO_2 was generated). At the end of incubation the culture plates were examined and appropriate colonies were subcultured for pure isolation. If no growth was found, the plates were incubated for an additional 24 hours and re-examined for growth of the organism. If no growth was found on the second examination, the plates were declared as negative. Identification of organisms was performed based on colony morphology, Gram stain, catalase test, CAMP test and bacitracin sensitivity test.Antimicrobial susceptibility testing were done for all isolated Group B Streptococcus by modified Kirby-Bauer disc-diffusion technique and results interpreted according to the Clinical Laboratory Standards Institute guidelines (CLSI). Using a sterile wire loop, 3-5 well isolated colonies of the test organisms were emulsified in 3 ml of sterile normal saline. The turbidity of the suspension was compared with McFarland turbidity standard 0.5 by adding normal saline. Both control and test inoculums were prepared. Group B Streptococcus collected from department of Microbiology, Bangabandhu Sheikh Mujib Medical University,Dhaka and was used as control strain to assess the performance of the method.

A sterile swab stick soaked with solution of the inoculum was streaked evenly over the surface of Muller Hinton blood agar plate in three directions rotating the plate approximately 60°. The inoculating plates were then allowed to dry for 3-5 minutes. Antibiotic disc were placed on inoculating plates 15 mm away from the edge of the plates and 25 mm apart from one disc to another from center to center. Within 30 minutes of placement of antibiotic disc, the inoculated plates were incubated aerobically at 37°C overnight. The following eight antibiotic discs were used: penicillin (10U), ampicillin (10µg), cefepime (30µg), ceftriaxone (30µg), chloramphenicol (30µg), clindamycin (2µg), erythromycin (15µg), Vancomycin (30µg). After incubation, sensitivity was determined by measuring the zones of inhibition from the edge of the disk to the edge of the inhibition zone using a ruler.Cultures with no inhibition zones were considered resistant.

Results:

Among 107 study population, Group B Streptococcus was isolated in both vaginal and vaginorectal swab in 11(10.28%) cases. Among 11 isolates, 6(5.61%) were isolated from vaginal swab,7(6.54%) from vaginorectal swab and 2(1.87%) isolates were common in both vaginal and vaginorectal swab (Table I).Among 11 isolates, all (100%) were susceptible to penicillin, ampicillin, ceftriaxone, cefepime and vancomycin. While reduced susceptibility was observed for clindamycin (72.73%), erythromycin (63.64%) and chloramphenicol (54.55%)

erythromycin (63.64%) and chloramphenicol (54.55%) (Table II).

Table-I: Isolation of Group B Streptococcus from vaginal and vaginorectal swab by culture (n=107)

Sample	Number (%)	Total isolation (%)
Vaginal swab	6(5.61)	
Vaginorectal swab	7(6.54)	
Common in both vaginal and vaginorectal swab	2(1.87)	11(10.28)

Table-II: Antimicrobial susceptibility pattern of isolated Group B Streptococcus (n=11) (CLSI, 2019)

Antimicrobial agents	Sensitive n (%)	Intermediate n(%)	Resistant n (%)
Penicillin	11(100.00)	0(0.00)	0(0.00)
Ampicillin	11(100.00)	0(0.00)	0(0.00)
Clindamycin	8(72.73)	2(18.18)	1(9.09)
Erythromycin	7(63.64)	1(9.09)	3(27.27)
Ceftriaxone	11(100.00)	0(0.00)	0(0.00)
Chloramphenicol	6(54.55)	1(9.09)	4(36.36)
Cefepime	11(100.00)	0(0.00)	0(0.00)
Vancomycin	11(100.00)	0(0.00)	0(0.00)

Discussion:

Regardless of ethnicity or socioeconomic status, Group B Streptococcusis one of the most common causes of prenatal infections worldwide. The rise in morbidity and mortality, as well as the rise in Group B Streptococcus disease occurrences, necessitate the development of preventive methods. Hence, administration of intrapartum antibiotic prophylaxis in colonized pregnant women has been recommended by center for disease control (CDC).[2]

In this study, based on culture method the prevalence of GBS in vaginal and vaginorectal samples was 5.61% and 6.54% respectively. According to the findings of this investigation, vaginorectal swab culture appears to be more effective than vaginal swabs in detecting GBS. According to Wollheimet al.[13] vaginal colonization occurs in 18.6% of cases and vaginorectal colonization occurs in 22.5% of cases, which is similar to the findings of this study. Bergeron et al.[14] and El Ailaet al.[15] observed that vaginal swab culture yielded higher colonization rates than vaginorectal culture. The difference between vaginal and vaginorectal swab was due to that the gastrointestinal tract is the primary reservoir of GBS, and that vaginal colonization represents dissemination from this source. On the other hand, Sadakaet al.[12] and Marconi et al.[16] found that GBS was isolated more frequently from vaginal samples than vaginorectal samples by culture method. This difference may be due to the type of culture medium used.

It appears that cultures of mixed vaginal and rectal specimens may be required to improve the chances of isolation GBS more.

Using the disc diffusion test, all tested isolates in this study were 100% sensitive to penicillin and ampicillin indicating that they would be effective as the first line agents for intrapartum antibiotic prophylaxis (IAP) in our settings. No resistance was also reported for ceftriaxone, cefepime and vancomycin. Similar findings have been reported in the study of Tarana and Shamsuzzaman[17] and Sadakaet al.[12] On the other hand, the very high level of penicillin and ampicillin resistance (100%) was found in the study of Onipedeet al.[11] Some women with penicillin allergy require other antibiotics for GBS prophylaxis such as clindamycin, erythromycin, or vancomycin, which were recommended in the CDC guidelines. All isolates in the present study were susceptible to vancomycin. However, 27.27% and 9.09% of the tested isolates were resistant to erythromycin and clindamycin respectively. Similar low susceptibility to erythromycin and clindamycin was reported in several other studies also. Sadakaet al.[12] reported 22.6% resistance to erythromycin and 15% to clindamycin. Resistance has been reported between 4 to 58.3% and 2.3% to 57.9% for erythromycin and clindamycin respectively in the study of Shabayek and Abdalla[18] and Sadakaet al.[12] As a result, erythromycin was removed from the list of alternative antibiotics recommended by the CDC in 2010. Thus susceptibility testing should be performed before administering erythromycin and clindamycin in order to ensure their activity against the isolates. According to the present study, routine reporting of antimicrobial susceptibity of GBS may help the clinician in choosing effective antibiotic therapy for invasive GBS infection.

Conclusion:

In the present study, it was revealed that all of the GBS isolates were 100% responsive to penicillin and ampicillin, indicating that they might be used as first-line antibiotics for IAP. In case of a penicillin allergy, susceptibility testing for erythromycin or clindamycin is required to ensure an alternative and effective chemoprophylaxis.

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Original Article

Effect of Educational Intervention on - Detection and Reporting of Adverse Drug Reaction in Different Levels of Hospitals

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Abstract:

Background: Adverse Drug Reaction (ADR) occurs beyond its known therapeutic effects and considered as one of the important reasons of morbidity and mortality. In developed countries, ADRs are being reported and monitored properly in order to ensure patients' safety. However, in Bangladesh, the physicians/health care providers and patients/consumers are not sufficiently responsive to the importance of ADR. This study was designed to evaluate the incidence of ADR as well as to find out the proportion of ADRsdetected and reported along with the reasons behind explored. **Methodology:** The study was conducted in four different level of health care facilities in both inpatient and outpatient departments. In BSMMU and Comilla Medical College Hospital four departments-Internal Medicine, Cardiology, Hepatology and Dermatology were included. In Comilla General Hospital-Medicine and Dermatology department and in Chouddagram Upazilla Health Complex Medicine department was included as study group. After taking the baseline information about the present status of adverse drug reaction in the study hospitals, questionnaire survey, focus group discussion and Key informant interviews were conducted and then intervention was given. **Results:** In BSMMU Hospital, the incidence of ADR was1%,7% and 4.7% in Internal Medicine, Hepatology and Dermatology outpatient departments respectively. In Comilla Medical College Hospital,the incidence of ADR in Dermatology outpatient department was 9.3%. In Inpatient departments of BSMMU Hospital, the incidence of ADR in Internal Medicine, Hepatology and Dermatology was 4%,2.7% and 6% respectively. In Comilla Medical College Hospital- this was 9%,2.6% and 1.3% in Medicine, Hepatology and Cardiology department respectively. In Comilla General Hospital, no case detected in Medicine outpatient department but in inpatient, it was 2.7% and in Dermatology outpatient department, the incidence was 9%. In Chouddagram Upazilla Health Complex, 2.7% cases were detected in inpatient department and no case was detected in outpatient department. The most important finding of this study is, none of these cases have ever reported to the authority, Directorate General of Drug Administration (DGDA) before intervention. The study revealed that the interventions were effective in improving reporting, but not in detection at any level though there was some individual response variation among the prescribers. **Conclusion:** This study portrayed a precise scenario about the present ADR detection and reporting situation in different levels of hospitals, enlightened about the reasons behind such practice and the appropriate method of formulating, introducing and implementing educational interventions.

Key words: adverse drug reaction (ADR), educational intervention, incidence of ADR, reporting and detection of ADR.

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Introduction:

Adverse drug reaction (ADR) is the undesirable effect of medicine that occurs beyond its known therapeutic effectsand is one of the key reasons of iatrogenic disease.[1,2] Adverse drug reactions are considered as one of the leading causes of morbidity and mortality. In the US 106,000 hospital patients died from ADRs in 1994, which was fourth to sixth leading cause of death after heart disease, cancer and stroke.[3] It has been estimated that 3-5% of all hospitalization can be attributed to ADRs in the US. On hospitalization, patients have 3 percent chance of a life-threatening drug reaction.[4] From the patient's point of view, ADR affects quality of life and weakens confidence in treatment. In addition, that negatively influence adherence to medications and increase costs of care. The manifestation of ADRs may also resemble disease process.[5] Though ADR has enormous clinical impact, methods to identify and monitor them are still limited.

Databases derived from electronic health records are increasingly used to monitor ADRs in addition to clinical trials, prescription events monitoring, spontaneous reporting and linked administrative databases. Nevertheless, association with rare ADR cannot be detected through clinical trials. Prescription events monitoring examine risk of newly marketed medicine, though has a short follow up and difficulty in selecting appropriate controls. Spontaneous reporting is the common system of detecting ADR, which is done through pharmacovigilance reporting system. In spite of so many systems of detecting ADR, under reporting remains a significant issue.[6,7]

ADRs have become a public agenda worldwide only after the medical catastrophe of thalidomide, a medicine that caused more than 10000 cases of phocomelia.[8] As a response to this disaster, 120 countries have their national pharmacovigilance system for reporting ADRs. Indian pharmacovigilance system is just in place, though the reporting has not increased up to the satisfactory level yet.[9-11] All of them report the collected data to WHO Collaborating Centre, which is also named as the Uppsala Monitoring Centre.[12]

In Bangladesh, as a consequence of initiative of World Health Organization a cell in Directorate General of Drug Administration was established in 1996. The Ministry of Health and Family Welfare formed 10 members ADR Advisory Committee (ADRAC) in 1997 to evaluate, analyze and make recommendation for solving problems of medicinal hazards due to ADRs. Till November 2010 only 13 cases of ADR had been reported to DGDA (DGDA). Bangladesh has submitted their first batch of adverse reaction case reports to VigiBase through VigiFlow in December 2014 and became the latest 120th member country of WHO pharmacovigilance program.[12] Thereafter, upto December 2021,total 3729 cases of ADR has been reported to DGDA.

The scenario of ADR in Bangladesh is quite unclear as not enough reports were received to understand the real country situation about safety of medicines used. Approximately 20 reports are expected from a member country each month, which is far more than the present-day reporting statistics.[13] This inadequate reporting is further worsened by the improper record keeping of data regarding ADR.[14] Considering the above described scenario, the present study was designed to obtain information about the prevalence of ADR in Bangladesh which may help to improve the activity of ADR reporting and monitoring.

Methods:
It was a formative research and an interventional study

which was conducted at Bangabandhu Sheikh Mujib Medical University Hospital, Comilla Medical College, Comilla General Hospital and ChouddogramUpazilla Health Complex from October 2014 to February 2016 after the ethical issues of this study had been reviewed and approved by Institutional Review Board, Bangabandhu Sheikh Mujib Medical University (BSMMU). Baseline information was obtained about the present status of Adverse Drug Reaction in the study hospitals. Chronological register and treatment records of individual cases of selected four departments kept in the Record Room were included as sample. From those records, necessary retrospective data of diagnosed cases of ADR were collected. It included 600 retrospective patientswho were diagnosed as ADR on admission or later. For the prospective data, 100 outpatient encounters of each department of BSMMU, Comilla Medical College Hospital, Comilla General Hospital and Chouddagram Upazilla Health Complex were recorded. Questionnaire survey, focus group discussion and Key Informant Interviews were conducted among the prescribers of these study Hospitals to identify their understanding and perception regarding ADR. After completion of the baseline study in four respective hospitals, a package of intervention was developed and introduced which includes Seminars, Face to face discussion with academic detailing, Distribution of ADR Reporting Form, Reminder strategy (through SMS to mobile phone). After one month of introducing intervention, the endline survey was conducted to evaluate the efficacy of the package of intervention. Appropriate statistical test (Z test of Proportion) was done in this study for drawing an effective conclusion. Statistical analysis was done with the help of online statistical analytic calculator and Microsoft Office Excel.

Results:
Table-I: Proportion of Detection and Reporting of ADR cases in the Outpatient Department of Four Departments of BSMMU (Before and After Intervention)

Departments	Before intervention (n=100)		After intervention(n=100)		P value	
	Detection of cases	Reporting of cases to DGDA	Detection of cases	Reporting of cases to DGDA	Difference between detection	Difference between reporting
	(in percentage)	(in percentage)	(in percentage)	(in percentage)		
Internal Medicine	1 (1/100)	0	1	1	0	0.31
Hepatology	7 (7/100)	0	1	1	0.02	0.31
Cardiology	0	0	0	0	0	0
Dermatology	4.7 (7/150)	0	2	2	0.23	0.15

F.N: In OPD of Internal medicine, Hepatology and Dermatology detection of ADR was 1%,7%,4.7% respectively before intervention and no cases were reported. After intervention those were 1%, 1% and 2% and all the cases were reported.

Table-II: Proportion of Detection and Reporting of ADR cases in Inpatient Department of Four Departments of BSMMU (Before and After Intervention)

Departments	Before intervention(n=150)		After intervention(n=150)		P value	
	Detection of cases	Reporting of cases to DGDA	Detection of cases	Reporting of cases to DGDA	Difference between detection	Difference between reporting
	(in percentage)	(in percentage)	(in percentage)	(in percentage)		
Internal Medicine	4 (6/150)	0	2 (3/150)	0	0.31	0
Hepatology	2.7 (4/150)	0	0	0	0.04	0
Cardiology	0	0	0	0	0	0
Dermatology	6 (6/100)	0	0	0	<0.01	0

F.N: In Inpatient departments of Internal Medicine, Hepatology and Dermatology, the detection of ADR was 4%,2.7% and 6% respectively before intervention and no cases were reported. After intervention, 2% cases were detected in Internal Medicine only but were not reported.

Table-III: Detection and Reporting of ADR Cases in Outpatient of Departments of Medicine and Dermatology of Comilla Medical College Hospital (Before and After Intervention)

Departments	Before intervention		After intervention(n=100)		P value	
	Detection of cases	Reporting of cases to DGDA	Detection of cases	Reporting of cases to DGDA	Difference between detection	Difference between reporting
	(in percentage)	(in percentage)	(in percentage)	(in percentage)		
Internal Medicine (n=100)	0	0	0	0	0	0
Dermatology (n=150)	9.33 (14/150)	0	6	6	0.33	0.01

F.N : In OPD of Internal Medicine no case was detected before and after intervention, In Dermatology, 9.3% case were detected those were not reported before intervention,but after intervention 6% cases were detected and were reported to the authority.

Table -IV: Detection and Reporting of ADR Cases in Inpatient of Three Departments of Comilla Medical College Hospital (Before and After Intervention)

Departments	Before intervention		After intervention(n=150)		P value	
	Detection of cases	Reporting of cases to DGDA	Detection of cases	Reporting of cases to DGDA	Difference between detection	Difference between reporting
	(in percentage)	(in percentage)	(in percentage)	(in percentage)		
Internal Medicine (n=300)	9.67 (29/300)	0	0	0	<0.05	0
Hepatology (n=76)	2.63 (2/76)	0	0	0	0.15	0
Cardiology (n=150)	1.33 (2/150)	0	0.7% (1/150)	0.7%	0.60	0.22

F.N : In inpatient departments of Internal Medicine, Hepatology and Cardiology, the detection of ADR was 9.6%, 2.63%, and 1.33% respectively before intervention and no case was reported. After intervention 0.7% cases were detected only in Cardiology department and also were reported.

Table-V: Detection and Reporting of ADR cases in Medicine (Inpatient and Outpatient) and Dermatology (Outpatient) Department of Comilla General Hospital (Before and After Intervention)

Departments	Before intervention (n=100 in outdoor and n=150 in indoor)		After intervention (n=100 in outdoor and n=150 in indoor))		P value	
	Detection of cases	Reporting of cases to DGDA	Detection of cases	Reporting of cases to DGDA	Difference between detection	Difference between reporting
	(in percentage)	(in percentage)	(in percentage)	(in percentage)		
Medicine (Indoor)	2.67 (4/150)	0	0	0	0.04	0
Medicine (Outdoor)	0	0	0	0	0	0
Dermatology (Outdoor)	9 (9/100)	0	7	7	0.60	<0.01

F.N : In Medicine Inpatient department, 2.67% cases were detected those were not reported before intervention, in OPD no case was detected before and after intervention. In Dermatology OPD, 9% cases were detected and those were not reported before intervention but after intervention 7% cases were detected and all were reported to the authority.

Table-VI: Detection and reporting of ADR Cases in Patients with Medical problems (Inpatient and Outpatient) of Chouddagram Upazilla Health Complex (Before and After Intervention)

Departments	Before intervention (n=100 in outdoor and n=150 in indoor)		After intervention (n=100 in outdoor and n=150 in indoor)		P value	
	Detection of cases	Reporting of cases to DGDA	Detection of cases	Reporting of cases to DGDA	Difference between detection	Difference between reporting
	(in percentage)	(in percentage)	(in percentage)	(in percentage)		
Medical Problems (Indoor)	2.7 (4/150)	0	0	0	0.04	0
Medicine (Outdoor)	0	0	0	0	0	0

F.N: In Medicine Inpatient department,2% cases were detected those were not reported before intervention.After intervention no case was detected in both inpatient and outpatient department.(Medical problems include all admitted cases excluding Surgery and Gynecology)

Table-VII: Perception of the prescribers of BSMMU about ADR Reporting (Before & after intervention)

Perception of prescriber	Statement	Before Intervention	After Intervention	P value
		(n=121)	(n=82)	
Knowledge about ADR reporting	Know that ADR is to be reported	42.1% (51/121)	91.5% (75/82)	<0.01
	Know how to report	26.4% (32/121)	87.8% (72/82)	<0.01
	The existence and role of ADRAC is known	32.5% (37/114) (7 not responded)	78.5% (62/79) (3 not responded)	<0.01
Attitude towards reporting	ADR reporting form is not available	78.8% (93/118) (3 not responded)	15.9% (13/82)	<0.01
	ADR form is too complicated	51.0% (56/110) (11 not responded)	8.75% (7/80) (2 not responded)	<0.01

	Before Intervention	After Intervention	P value
Do not have time to complete the form	**18.0%** (21/117) (4 not responded)	**18.5%** (15/81) (2 not responded)	0.93
Single ADR report will not contribute much in medical knowledge	**38.7%** (46/119) (2 not responded)	**26.3%** (21/80) (2 not responded)	0.06
Inadequate information to confirm that ADR is due to this medicine	**67.5%** (79/117) (4 not responded)	**56.2%** (45/80) (2 not responded)	0.11
Fear of harassment after reporting an ADR	**35.9%** (43/120) (1 not responded)	**15.9%** (13/82)	<0.01

F.N: There was significant improvement about the knowledge and attitude towards the reporting of ADR after intervention among the prescribers of BSMMU.

Table-VIII: Perception of prescribers of Comilla Medical College Hospital about ADR Reporting (Before & after intervention)

Perception of prescriber	Statement	Before Intervention	After Intervention	P value
		(n=34)	**(n=30)**	
Knowledge about ADR reporting	Know that ADR is to be reported	**23.5%** (8/34)	**86.7%** (26/30)	<0.01
	Know how to report	**21.2%** (7/33) (1 not responded)	**86.7%** (26/30)	<0.01
	The existence and role ADRAC is known	**23.5%** (8/34)	**70.0%** (21/30)	<0.01
Attitude towards reporting	ADR reporting form is not available	**85.3%** (29/34)	**10.7%** (3/28) (2 not responded)	<0.01
	ADR reporting form is too complicated	**65.6%** (21/32) (2 not responded)	**27.6%** (8/29) (1 not responded)	<0.01
	Do not have time to complete the form	**48.5%** (16/33) (1 not responded)	**36.7%** (11/30)	0.34
	Single ADR report will not contribute	**58.8%** (20/34)	**34.5%** (10/29) (1 not responded)	0.04
	Inadequate information to confirm that this ADR is due to this medicine	**50.0%** (17/34)	**43.3%** (13/30)	0.60
	Fear of harassment after reporting an ADR	**41.2%** (14/34)	**26.7%** (8/30)	0.21

F.N : Significant improvement was observed about the knowledge and attitude towards the reporting of ADR after intervention among the prescribers of Cumilla Medical College.

Table-IX: Perception of prescribers of Comilla General Hospital about ADR Reporting (Before & after intervention)

Perception of prescriber	Statement	Before Intervention	After Intervention	P value
		(n=5)	**(n=5)**	
Knowledge about ADR reporting	Know that ADR is to be reported	**20.0%** (1/5)	**100.0%** (5/5)	<0.01
	Know How to report	**40.0%** (2/5)	**100.0%** (5/5)	<0.01
	The existence and role ADRAC is known	**25.0%** (1/4) (1 not responded)	**60.0%** (3/5)	0.25
Attitude towards reporting	ADR reporting form is not available	**100.0%** (5/5)	**20.0%** (1/5)	<0.01
	ADR reporting form is too complicated	**50.0%** (2/4) (1 not responded)	**25.0%** (1/4) (1 not responded)	0.45
	Do not have time to complete the form	**40.0%** (2/5)	**20.0%** (1/5)	0.48
	Single ADR report will not contribute	**100%** (3/3) 2 not responded	**40.0%** (2/5)	<0.01
	Inadequate information to confirm that this ADR is due to this medicine	**80.0%** (4/5)	**40.0%** (2/5)	<0.01
	Fear of harassment after reporting an ADR	**0%** (0/5)	**0%** (0/5)	0.00

F.N: Improvement was also seen among the prescribers of Cumilla General Hospital about the knowledge and attitude towards ADR reporting after intervention.

Table-X : Perception of prescribers of Chouddagram Upazilla Health Complex about ADR Reporting (Before & after intervention)

Perception of prescriber	Statement	Before Intervention	After Intervention	P value
		(n=5)	**(n=5)**	
Knowledge about ADR reporting	Know that ADR is to be reported	**20.0%** (1/5)	**100.0%** (5/5)	<0.01
	Know how to report	**0.0%** (0/5)	**100.0%** (5/5)	
	The existence and role of ADRAC is known	**25.0%** (0/4) (1 not responded)	**80.0%** (4/5)	0.05
Attitude towards reporting	ADR reporting form is not available	**100.0%** (5/5)	**0.0%** (0/5)	
	ADR reporting form is too complicated	**50.0%** (2/4) (1 not responded)	**20.0%** (1/5)	0.33
	Do not have time to complete the form	**20.0%** (1/5)	**20.0%** (1/5)	
	Single ADR report will not contribute	**40%** (2/5)	**20.0%** (1/5)	0.48
	Inadequate information to confirm that this ADR is due to this medicine	**60.0%** (3/5)	**40.0%** (2/5)	0.51
	Fear of harassment after reporting an ADR	**0%** (0/5)	**0%** (0/5)	

F.N : Improvement was significant among the prescribers of ChouddagramUpazilla Health Complex about knowledge and attitude towards ADR reporting after intervention.

ADR = Adverse Drug Reaction, **ADRAC** = Adverse Drug Reaction Advisory Committee
• **'2 proportion Z test'** was done between before and after to estimate the level of significance of the difference
• **P<0.05** was considered significant throughout the study

Discussions:
The study was conducted in four different facilities of health care system -the BSMMU (Bangabandhu Sheikh Mujib Medical University), which is a tertiary care hospital and also considered as center of excellence, Comilla Medical College Hospital, a tertiary care Hospital, Comilla General Hospital, a secondary care hospital and Chouddagram Upazilla Health Complex, which is a primary care hospital to see the overall situation of the detection and reporting of adverse drug reaction.

In almost all facilities, the reporting of the detected cases of ADR has increased after intervention. In a study in Portugal, a tenfold increase in the rate of ADR reporting was observed following an educational intervention.[15] In another study which was conducted in Germany also revealed significant improvement of ADR reporting after educational intervention.[16] Another observation of our study is that the prescribers of ChouddagramUpazilla Health Complex did not show any response following intervention. To explain this, we can say that globally primary care institutions are poor responders than the specialists and being a primary care Hospital ChouddagramUpazilla Health Complex is not an exception.[17]

In this study we've tried to evaluate the knowledge and attitude of the prescribers of all facilities towards ADR reporting through a questionnaire before and after intervention. We found that the knowledge of the prescribers about ADR reporting has been enhanced significantly after intervention. This result is consistent with the findings of Bisht et al.[18] Less than 40% of the prescriber were aware about the existence and role of ADRAC (Adverse Drug Reaction Advisory Committee, which is the National Authority for Pharmacovigilance of Bangladesh) before intervention which is an alarming sign for Pharmacovigilance activity in Bangladesh, though it was raised after intervention. This is quite similar with the findings of the study done by John et al.[19] One of the common excuses of the prescribers was lack of time to fill the ADR reporting form and this perception is in line with other studies and these studies also revealed that it is one of the discouraging factors for suspected ADR reporting.[20-21] The availability of ADR form and making that easy to fill can encourage the prescribers for reporting, which has been proved in our study. Some other study also revealed its importance.[2,20]

Our study revealed that enhancing knowledge and creating awareness can improve the ADR reporting leading to reporting of all the detected cases irrespective of the level of care. But regarding detection there was no significant improvement. One might be the reason is the period after intervention was small but as the diagnostic skill cannot be developed through this single and short duration intervention. Actually, detection requires improvement of diagnostic skill that is to differentiate between ADR and disease. Possibly the prescribers are not still capable or not interested to give some more effort to differentiate between ADR and the disease, which might be the reason for insignificant improvement in detection. However, this package of educational intervention is found to be effective in improving ADR reporting that is improving Pharmacovigilance situation of a country which is compatible to the requirements of Uppsala Monitoring Centre. Therefore, we can say that, as this educational intervention is effective at all level of health care, so it can be replicated in other situations and types of health facilities.

Conclusion:
The present study attempted to improve the detection and reporting of ADR at different level of hospitals. As an educational intervention this was supposed to improve the both, but unfortunately it was effective inimproving reporting, not in detection. Failure to improve the detection of ADR possibly because, the prescribers usually prefer to learn clinical diagnosis from clinicians and they already have a confidence about their diagnostic skill. The present study has indicated that the educational intervention after graduation is effective in altering behavior relating to reporting, but not to improve detection and diagnosis. For that purpose, possibly an intervention at undergraduate course and during internship training might be helpful.

Recommendations:
To improve detection, the scientific understanding about ADR as 'Drug Induced Disease' require further scientific research explaining the mechanism of ADR and differentiating points with disease. The detail understanding on this phenomenon is to be communicated to the prescriber in their early part of training. Attempt should be made to identify the difficulties in other facilities in implementing this intervention. Whether the private health facilities are suitable for this educational intervention or not needs to be explored.

Limitations:
The study was conducted in few selected facilities and therefore cannot be generalized for the whole country. It was conducted within very limited time and therefore sustainability of the change after intervention could not be evaluated. Regulatory stewardship was not included in this intervention.

Conflict of interest- None.

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Case Report:

Missing Copper-T in Urinary Bladder: A Rare Entity

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Abstract:

Background: Intra-uterine contraceptive devise (IUCD) is the most commonly used form of long acting reversible contraceptive method (LARC) through out the world. The 380 A is T-shaped device approximately 36 mm in length and 32 mm in diameter that contains 380 mm² of copper on its vertical and side arms. The IUCD has a useful lifespan of at least 10 years[1]. A very rare but potentially life threatening complication of IUCD use is uterine perforation with an incidence of 0.12 to 0.68 per 1000 insertions[2]. The other major risks reported are ectopic pregnancy, spontaneous abortion and expulsion. Missing CU-T within the bladder is a rare entity.

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Case Report:

A 26 year of old lady para 1+1, age of last child 8 years, admitted into Cumilla medical college hospital with the complaints of pain in lower abdomen for 1 year, which was severe for 1 month and she also complains of dysuria for same duration. She gave history of copper-T insertion 2 year back which was inserted following diagnostic dilatation and curettage for her secondary amenorrhea. Regarding her menstrual history, she was amenorrhoic for 7 year after her spontaneous abortion. According to obstetric history she is a mother of one child delivered vaginally at home. She had an abortion within one year after her child birth. She took DMPA injection single dose for contractive purpose. After that she was suffering from secondary amenorrhea for 7 years. For that reason she was treated by diagnostic D & C and inserted copper-T in a government hospital. On per vaginal examination the thread of her copper–T was not felt. TVS (transvaginal sonography), plain X-Ray KUB were done & suggested a case of dislodged copper-T, which was noted in the urinary bladder. With the help of urologist retrieval of copper-T was done successfully. Patient's recovery was uneventful and she was discharged one day after her minimal invasive surgery.

Discussion:

Perforation of the uterus with copper-T is an uncommon phenomenon. Uterine perforation, which occurs at the time of insertion, has been reported at a rate of 1-2 events per 1000 insertions[1]. Esposito et al[3] postulate two mechanisms of uterine perforation, namely, immediate traumatic perforation and late secondary perforation caused by gradual erosion through myometrium. Risk factor for perforation include insertion by less experienced clinicians, postpartum insertion (<6 months since delivery), higher number of previous abortions and lactation[4]. Perforation typically occurs into the uterorectal pouch with an anteverted uterus or in the vesicouterine pouch if uterus is retroverted[5] but very[2] rare in urinary bladder. This is an uncommon case. Here displaced CU-T

This is an uncommon case. Here displaced CU-T was detected in urinary bladder by plain X-Ray KUB and finally localized the device within the urinary bladder by transverse vaginal scanning. Most of the perforation go unnoticed at the time of insertion and is suspected due to persistent symptom of mild lower abdominal pain during follow ups[6]. In cases where complications like visceral perforations are suspected, CT scan or MRI may be helpful. TVS should be used the first investigative modality to confirm the presence of intrauterine CU-T.

CU-T can be removed very easily with the help of artery forceps as an office procedure. However, on failure to remove CU-T with artery forceps, hysteroscopy should be sought to remove CU-T. In cases of intraperitoneal migration, laparoscopy or laparotomy may be required.
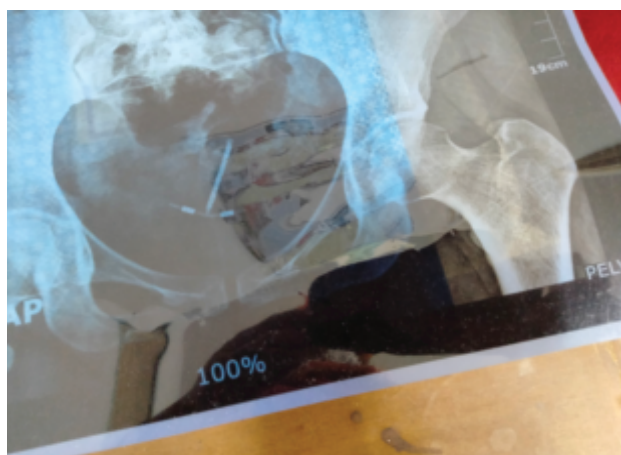
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Figure 1: Plain X-Ray KUB showing displaced Cu-T within the pelvic cavity

Figure 2 : TVS showing Cu-T within the urinary bladder