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Editorial

Redefining medical professionalism

INTRODUCTION:

At the beginning of new century, genuine medical professionalism is in peril. The future of medical practice became increasingly uncertain due to the changing needs of society and health care delivery system. Lack of unity among physicians, the erosion of patients' trust, medical errors, bioterrorism, weakening ability to self-regulate, compromised access to health care delivery, conflicts of interest precipitated by managed care and for-profit medicine, the pharmaceutical industry's role in patient care and knowledge-based medical education reflect the range of issues that challenge the medical profession globally [1-3].

CONCEPT OF MEDICAL PROFESSIONALISM OVER TIME:

The concept of medical professionalism has been the subject of major change over the millennia in general and specially in the last century. In the past five years alone, hundreds of new articles covering the topics of professionalism and professional behavior have been published. As a result, medical school curricula and modern specialist training programs become increasingly competence based. Professionalism is emerging as an integral part of course content, training and assessment system of medical education[1].

THE NEW CONCEPT OF MEDICAL PROFESSIONALISM:

The traditional definition of medical professionalism is based on personal knowledge and expertise in the doctor-patient relationship. Recently a number of formal definitions of professionalism have been proposed, all of which include the word 'trust'. Essential levels of trust can be achieved and sustained through consistent expression of professional attitudes and behaviors. These include integrity, accountability, motivation, selflessness, empathy, and the pursuit of excellence through lifelong learning. The definition that incorporates all the key attitudes and behaviors is "ensuring trust by doing the right things, for the right reasons, in the right way, and at the right time." In modern medicine, medical professionalism focuses on the special social communication skills, which includes the ability to explain the patient's illness at the level of the patient and to help them deciding and selecting appropriate treatment. Modern medical professionalism serves as a standard of care and plays an important role in the improvement of the patient's treatment following practice guidelines and improves their professional judgment based on honesty and empathy. Such standards can be further improved by developing communication skills, clinical knowledge, and teamwork skills [4-7].

CONCLUSION:

Professional status is approved by the society, and therefore professionals have some obligations to meet the societal needs and expectations. Many contemporary societal factors, such as changes in doctors' attitudes and increased media attention to health care issues are well recognized challenges to true medical professionalism. Medical education needs to focus on establishing a well-structured curriculum with early exposure of professionalism among medical students. Appropriate programs for role modeling, mentoring and special attention to the assessment of professional behavior is the key to counteract the newly identified challenges to medical professionalism.

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REFERENCES:

1. van Mook WN, de Grave WS, Wass V, O'Sullivan H, Zwaveling JH, Schuwirth LW, van der Vleuten CP. Professionalism: Evolution of the concept. European Journal of Internal Medicine. 2009 Jul 1; 20(4):e81-4.
2. Board S. Medical professionalism in society. The New England journal of medicine. 1999; 341: 1612-6.
3. Brennan MD. The role of professionalism in clinical practice, medical education, biomedical research and health care administration. Journal of translational internal medicine. 2016 Jun 1; 4(2):64-5.
4. Buyx AM, Maxwell B, Schöne Seifert B. Challenges of educating for medical professionalism: who should step up to the line? Medical education. 2008 Aug; 42(8):758-64.
5. Yoo C. The challenges of medical education in developing "true medical professionalism". Korean journal of medical education. 2017 Dec; 29(4):283.
6. Blank L, Kimball H, McDonald W, Merino J. Medical professionalism in the new millennium: a physician charter 15 months later. Annals of internal medicine. 2003 May 20; 138(10):839-41.
7. Hilton S. Education and the changing face of medical professionalism: from priest to mountain guide? Br J Gen Pract. 2008 May 1; 58(550):353-61.

Original Article

Migraine Headache in Stroke Patients of Bangladesh: A Case - Control Study

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Abstract:

Background: *Migraine and Stroke are common neurological disorder originating from brain. Searching for the association between these two diseases can give clue about possible common etiology and also emphasize the search for the other condition in patient with migraine or stroke.*

Aim: *To find out the association between migraine and stroke.*

Method: *This was a case control study conducted in the department of neurology, Dhaka Medical College Hospital, from july 2012 to june 2014. Sample size was 100, consisting 50 patients with stroke as case and 50 age and sex matched attendants of patients without stroke as control. The proportion of migraineurs (both migraine with aura and migraine without aura) were detected in both case and control group. Data was collected through predesigned questionnaire.*

Results: *In this study, migraine was significantly common among stroke population than normal control. Thirteen (26%) of cases and 5 (10%) of control had migraine with odds ratio 3.16 and p-value 0.037. In case group, among migraineurs 1(05%) have hemorrhagic stroke and 12(40%) have Ischemic Stroke. Proportion of migraine with aura was more common in stroke population 4 (31%) than control 1(20%). The odds ratio was 1.7 but the p- value 1; which was not statistically significant.*

Conclusion: *In this study, migraine was significantly more common among stroke population. This result implies that proportion of migraineurs in patients with stroke is higher than the non – stroke individuals.*

Keywords: *Stroke, Migraine, Migraineurs.*

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BACKGROUND :

Stroke is sudden onset focal neurological deficit which is non traumatic vascular in origin.[1] Stroke is third leading cause of death in Bangladesh. The world Health Organization ranks Bangladesh's mortality rate due to stroke as number 84 in the world.[2]

Migraine is a common disabling primary headache disorder. Epidemiological studies have documented its high prevalence and high socioeconomic and personal burden. It is ranked as number 19 of all diseases causing disability worldwide. Prevalence of migraine is about 18 percent in women and 6 percent in men, and is highest between 25 and 55 years of age.[3]

Although the etiopathogenesis of migraine remains incompletely understood, it is now increasingly recognized that migraine is more complex than a sole vascular disease as previously thought. Recent neuroimaging studies suggests that migraine and

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cerebrovascular disease are comorbid conditions.[4] In a case control study involving 314 stroke patients and 314 control subjects aged 16-44 years, demonstrated that migraine with aura was associated with ischemic stroke in young women but not men.[5]

The common pathophysiological mechanism underlying these two conditions has received much amount of attention over the last decade. Many studies have supported the hypothesis of excessive neocortical cellular excitability as the main pathological mechanism underlying the onset of both diseases. Notably, some forms of stroke and migraine are known to be channelopathies.[6]

Establishing the association between stroke and migraine is important in clinical point of view because this will emphasize the search of the co-existence of stroke or migraine in same patient.

METHODS:

This was a hospital based case – control study, conducted in out patients department of Neurology, Dhaka Medical College Hospital in between July, 2012 to June, 2014. Sample size was 100, consisting 50 patients with stroke as case and 50 age and sex matched attendants of the patients without stroke as control. Every participant of case and control fulfilled inclusion and exclusion criteria. The proportion of migraineurs (both migraine with aura and migraine without aura) was detected in both case and control group. Stroke ,migraine with aura and migraine without aura was diagnosed by consultant neurologist fulfilling the criteria given by MONICA(Monitoring trends and determinants of cerebrovascular disease) diagnostic criteria for stroke and international classification of headache disorder (2nd edition). The study protocol was approved by the ethical committee of Dhaka Medical College. Data was collected through predesigned questionnaire. Analysis of data will be done with the help of a computer by SPSS program, latest version software facilities. Appropriate statistical methods will be applied for data analysis and comparison with 95% confidence interval taking p value d" 0.05 as significant.

RESULTS:

Table -I: Age distribution

Age (in year)	Case (n=50)		Control(n=50)		P value
	N	%	N	%	
5-20	9	18	8	16	
20-35	15	30	14	28	
35-50	19	38	20	40	
50-75	7	14	8	16	
Mean ± SD	37.16 ± 14.76		37.96±14.96		0.78ns
Range (min-max)	(7-72)		(7-73)		

P-value < 0.05 was considered to be significant.
ns =Not significant.
P-value was reached from unpaired t – test.

Table – 1 shows age distribution of case and control group. Majority of participants were from age group (35-50) years; both in case -19(38%) and control -20(40%)group.

Mean age of case group was 37.16 ± 14.76 and of control group was 37.96 ± 14.96.

There were no statistically significant deference of mean age between case and control group.

IST – Ischemic Stroke.
HGE- Hemorrhagic Stroke.

Fig.-1: *Types of Stroke in case group*

Figure – 1 shows different types of stroke in case group. Majority patients- 30(60%) of case group were suffering from Ischemic stroke.

Table-II : *Proportion of migraineurs in case and control group*

Migraine	Case (n=50)		Control (n=50)		Statistical analysis
	N	%	N	%	
Present	13	26	5	10	95% CI=1.032 – 9.6856
Absent	37	74	45	40	P-value=0.037[s]
					OR=3.16

p-value< 0.05 was considered to be significant.
S = significant.
95% CI= 95% Confidence interval.
OR= Odds ratio.
Results were obtained from Chi-square test.

Table – II compares proportion of migraineurs in between case and control group. Thirteen(26%) of cases and 5(10%) of controls had migraine.The odds ratio was 3.16, 95% CI = 1.032-9.6856 and P-value 0.037;which means migraine was significantly more common in stroke patients than normal control group.

Table – III shows proportion of migraineurs in different types of Stroke population. There were 1(5%) migraineurs among Hemorrhagic stroke in comparison to 12(40%) in case of ischemic stroke. Migraineurs are significantly more common among ischemic stroke patients.

Table – IV compares proportion of migraine with aura in between case and control group. Proportion of migraine with aura was more in cases - 4(31%) than control – 1(20%).The odds ratio was 1.7; but it was not statistically significant.

Table-III : *Migraineurs in different types of Stroke in case group*

Migraine	HGE (n=20)		IST (n=30)		P -
	N	%	N	%	value
Present	1	05	12	40	
Absent	19	95	18	60	0.005[s]

P-value< 0.05 was considered to be significant.
s = significant.
HGE = Hemorrhagic Stroke.
IST = Ischemic Stroke.
Results were obtained from Chi-square test.

Table-IV : *Migraine with aura in case and control group*

	Case (n=13)		Control (n=5)		Statistical analysis
	N	%	N	%	
Migraine	4	31	1	20	
With aura					
Migraine					95% CI=0.14 – 21.39
Without aura	9	69	4	80	P-value=1[ns]
					OR=1.7

p-value< 0.05 was considered to be significant.
ns = not significant.
95% CI= 95% Confidence interval.
OR= Odds ratio.
Results were obtained from Fisher exact test.

DISCUSSION :

In this study majority of participants were from age group (35-50) years; both in case -19(38%) and control -20(40%) group. Mean age of case group was 37.16 ± 14.76 and of control group was 37.96 ± 14.96. There were no statistically significant deference of mean age between case and control group. Male were predominant in both case - 26(52%) and control – 28(58%) group. Majority participants were married in both case -23(46%) and control -24(48%) group. These findings are consistent with Leniger et al.[7]

Majority patient's 30(60%) of case group were suffering from Ischemic stroke and only 20(40%) patients were suffering from hemorrhagic stroke. These findings are consistent with Islam et al.[1]

In this study, migraine was significantly more common in cases than control group. Thirteen (26%) of cases and 5(10%) of controls had migraine. The odds ratio was 3.16, 95% CI = 1.032-9.6856 and P-value 0.037; which was statistically significant. This findings were in consistent with Camerlingo et al.[8] who found prevalence of migraine was 24% in patients with stroke with odds ratio 2.4.This result implies that null hypothesis was rejected and this study hypothesis 'The proportion of migraineurs in patients with stroke is higher than that of normal individuals.' was established.

In case group, there were 1(5%) migraineurs among Hemorrhagic stroke in comparison to 12(40%) in case of ischemic stroke. Migraineurs are significantly more common among ischemic stroke patients. Etminan et al also have same findings.[9]

In this study, proportion of migraine with aura was more in cases- 4(31%) in comparison to control-1(20%). The odds ratio was 1.7;but it was not statistically significant (95% CI = 0.14 – 21.39 and p value = 1). This finding was not in full similarity with Kruit et al.[10] who found migraine with aura was significantly more prevalent in stroke population. Small sample size and single center study may explain this discrepancy.

CONCLUSION:

Migraine and stroke are two common disorders encountered in neurological practice. The current study suggested association between migraine and stroke. So, it is recommended that all patients with stroke should be evaluated for presence of migraine. Further multicenter research on this topic with larger sample is recommended.

REFERENCES:

1. Mi JL, Chungbin L, Chin SC : The Migraine – Stroke Connection. *Journal of Stroke* 2016;18(2): 146-156.
2. Islam MN, Moniruzzaman M, Khalil MI : Burden of Stroke in Bangladesh. *International Journal of Stroke* 2012: 15(2): 121-128.
3. Goadsby PJ, Lipton RB, Ferrari MD: Migraine–current understanding and treatment. *N Engl J Med* 2002, 346(4):257–270.
4. Lipton RB, Bigal ME: The epidemiology of migraine. *Am J Med* 2005, 118(Suppl 1):3S–10S.
5. Charles A: Migraine is not primarily a vascular disorder. *Cephalalgia* 2012, 32(5):431–432.
6. Charles A: The evolution of a migraine attack - a review of recent evidence. *Headache* 2012, 53:413–419.
7. Leniger T, Driesch SVD, Isbruch K, Diener HC, Hufnagel A: Clinical characteristics of patients with comorbidity of migraine and epilepsy. *Headache* .2003; 43:672-677.
8. Camerlingo M, Romorini A, Ferrante C, Valente L, Moschini L: Migraine and cerebral infarction in young people. *Neurol Sci* 2010, 31(3):293–297.
9. Etminan M, Takkouche B, Isorna FC, Samii A: Risk of ischaemic stroke in people with migraine: systematic review and meta-analysis of observational studies. *BMJ* 2005, 330(7482):63.
10. Kruit MC, Launer LJ, Ferrari MD, van Buchem MA: Infarcts in the posterior circulation territory in migraine. The population-based MRI CAMERA study. *Brain* 2005, 128(Pt 9):2068–2077.

Original Article

Self-poisoning: A Study in a Tertiary Care Hospital

Sarkar NK[1], Choudhury AY[2], Roy M[3]

ABSTRACT

Aim: *The study was conducted with the aim of finding out the types, causes, socio- demographic co-relates and outcome of self-poisoning.*

Methods: *This was a descriptive cross-sectional study where 100 patients with history of self-poisoning, admitted in adult medicine units of Dhaka Medical College Hospital from January to June 2005 were included purposefully.*

Results: *Among the study population 53% cases were suicidal, 16% accidental and 31% deliberate self-harm. Marital disharmony was the most common underlying cause (36%). Most of the victims were female (62%) and married (65%). Thirty three percent patients were housewives, followed by students (22%). Majority of the study population (77%) were between 11-30 years age group with the mean age±SD of 24.9±3.8 years. Self-poisoning was common among lower socio- economic group (54%). Insecticides were the most commonly used agent (34%), especially among suicidal cases. Sedatives were used in 13% of cases and preferred by those who committed deliberate self-harm. In 11% cases there was history of previous suicidal attempt. Mortality rate was 1%, with 97% full recovery and 2% developed complications.*

Conclusions: *In this study it was observed that suicidal ideation was the most common cause of self-poisoning, insecticides were the most commonly used agent and lower socio-economic groups were the most vulnerable in such cases.*

Keywords: *Poisoning, self-poisoning*

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INTRODUCTION

Poisoning refers to the development of dose related adverse effects following exposure to chemical, drugs or xenobiotics.[1] Recent estimates suggest that each year worldwide there is 3 million acute poisoning with 2,20,000 deaths.[2] Much of this burden is borne by developing countries where more than 80% of cases are fatal pesticide poisoning related hospitalization.[3]

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Poisoning is an important health problem in Bangladesh causing around 2,000 deaths per year.4 This issue is important for health ground as well as for economic and social reasons. There was a change in the trends of pattern of poisoning over the recent decades from eldrine poisoning to organophosphorus poisoning as an agent of attempted suicide.[5-6]

Among the self-poisoning cases, suicidal intensities are most common. Usually the victims choose easily available substances and pesticides are preferable one. Ninety nine percent of pesticide poisoning occurs in developing countries.[4]

Organophosphorus compounds and carbamate insecticides are easily available in Bangladesh, in fact, it is a household item in rural areas. Nationwide information on poisoning is not available in our country. In Srilanka, available information on hospital admission due to poisoning for the period

of 1980-1989 shown all poisoning ranged 154-200/ 1,00,000 populations while those due to pesticide poisoning varied between 80-108/1,00,000 populations, with highest number of case fatality amongst all poisoning.[7]

Benzodiazepine and other sedative-hypnotic agents are being popular for self- induced poisoning. Because of widespread popularity, these drugs are commonly abused and also used with different food items for purpose of stupefying especially on journey. Benzodiazepines are frequently used in overdose, either alone or in association with other substances.[8]

Different common household substances may be used for suicidal agents or ingested accidentally. Substances like detergents or cleaning agents, fuel, paints, weed killers, insect spray, cosmetics and common drugs are few examples. Poisoning from these substances is usually accidental and children between the ages of 9 months to 5 years are at risk, although adults may also be poisoned.[9]

Accidental ingestion of acid of caustic solution is a very common phenomenon in workplace especially among jewellers. Some poisoning cases occur in rural Bangladesh by snake bite, commonly in hilly areas like Chittagong and Sylhet with some cases of sea snake bites in coastal areas. Poisonous fishes are available in the Bay of Bengal also in the fresh water of Bangladesh e.g. puffer fish. It contains deadly channel-toxins causing paralysis and electrolyte imbalance.[6]

Acute poisoning as a result of deliberate ingestion, inhalation or due to accident is a common medical emergency. Pattern of poisoning in Bangladesh reflects the socio-economic condition of the country. The cause of poisoning in majority of cases is due to dispute among the family members because of complex relationship in our country. Due to random use of pesticides, poisoning from this substance is very common and in most of the cases outcome is fatal. Availability of pesticides to the farmers and their family members is the key factor of high incidence of this type of poisoning. The usual story is that some chemical was brought for purpose of destroying pests and insects, part of which was used up and remainder was preserved in an accessible part. Overwhelmed by frustrations or unable to cope with domestic problems or due to poverty, the victim takes the chemical intentionally.[10]

MATERIALS AND METHODS

This was a hospital-based descriptive cross-sectional study. The study was conducted at Medicine inpatient department of Dhaka Medical College Hospital from January 2005 to June 2005. Total 100 patients with the history of self- poisoning were enrolled purposively according to inclusion and exclusion criteria. Inclusion criteria were - adult patients admitted in medicine units of Dhaka Medical College Hospital with the history of self-poisoning with the intension of suicide, deliberate self-harm or accidental. Exclusion criteria were – homicide or induced poisoning cases, presence of any organic causes of coma and unwilling to give informed written consent. Data was collected by direct interview of patients and their attendants using a semi-structured questionnaire. Relevant investigations were done as per hospital facility. The study was approved by the institutional ethical review committee. All patients under the study were informed about the nature and aim of the study. They were assured about the confidentiality of information. Before data collection, informed written consent was taken from patient himself/herself or his/her attendants. Data analysis was done by MS Excel.

RESULTS

The study was carried out in inpatient department of five medicine units of Dhaka Medical College Hospital, both male and female wards. One hundred patients with the history of self-poisoning were selected purposefully in a six months period from January 2005 to June 2005. Age ranged from 13 to 60 years, with mean age±SD 24.9±3.8 years with sex ratio 38:62 (male:female). Sixty five percent patients were married. Most of the study population (33%) were housewives followed by students (22%). Most of the patients were from poor socioeconomic background (54%) and 38% were middle-class (Table-I). Most of the occurrences (87%) took place at home and rest (13%) outside of home. Suicidal ideation was the most common cause (53%) followed by self-harm (31%) and accidental (16%) (Figure-1). Insecticides were used by 34% patients whereas rat killer poison was used in 7%, harpic 7%, savlon 3%, benzyl benzoate lotion 4%, benzodiazepine 13%, antipsychotic/antidepressant 8%, mixed drugs 6%, copper sulphate 4%, acid 3% and other agents in 11% cases (Table-II). Majority of the patients (63%) were

taken to the hospital within 4 hours, 24% within 8 hours, 9% within 12 hours and 4% after 12 hours of occurrence (Figure-2). Seven percent cases had previous history of drug abuse, 11% cases had previous history of suicidal attempt and 8% patients were suffering from psychiatric illness (Table-3). Familial disharmony was the most common underlying cause (36%), followed by domestic quarrelling (17%), love affairs (8%), psychiatric illness (8%), accidental (16%), curiosity (1%) and other causes (14%) (Table-III). Ninety seven percent patients recovered completely, 1% died and 2% developed complications (Table-IV).

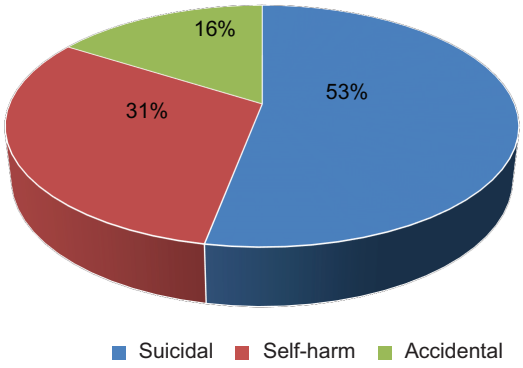

Figure-1: *Nature of self-poisoning (n=100)*

Table-1 : *Socio-demographic characteristics of self-poisoning (n=100)*

Variables	Number
Age (year)	
11-20	46
21-30	31
31-40	11
41-50	9
51-60	3
Mean age (±SD) = 24.9±3.8 years	
Sex	
Male	38
Female	62
Marital status	
Married	65
Unmarried	34
Others	1
Socio-economic condition	
Poor	54
Middle-class	38
Rich	8
Occupation	
House-wife	33
Student	22
Farmer	4
Service-holder	6
Day-labourer	7
Garments worker	8
Unemployed	8
Others	12

Table-2: *Causative agents for self-poisoning (n=100)*

Causative agent	Percentage (%)
Insecticides	34
Benzodiazepine	13
Harpic	7
Savlon	3
Benzyl benzoate lotion	4
Rat killer poison	7
Antipsychotic/antidepressants	8
Mixed drugs	6
Copper sulphate	4
Acid	3
Others	11

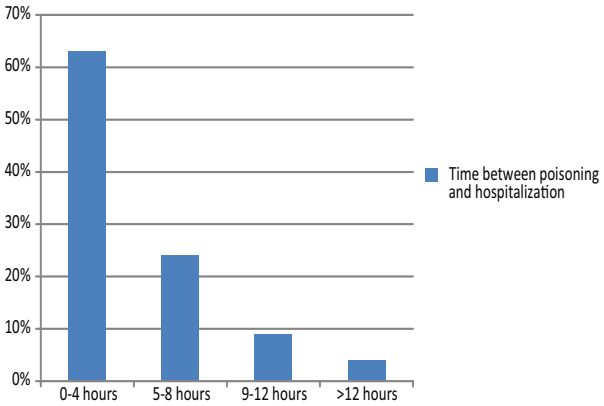

Figure 2: T*ime between poisoning and hospitalization (n=100)*

Table 3: Past history (n=100)

Variables	Percentage (%)
History of drug abuse	
Yes	7
No	93
History of suicidal attempts	
Yes	11
No	89
History of psychiatric illness	
Yes	8
No	92

Table-4: Causes and outcome of self-poisoning (n=100)

Underlying causes	Percentage (%)
Familial disharmony	36
Domestic quarrelling	17
Psychiatric illness	8
Love affairs	8
Accidental	16
Curiosity	1
Others	14
Outcome	
Complete recovery	97
Complications	2
Death	1

DISCUSSION

The objective of this study was to enumerate the mode, provocative factors, socio- demographic variables and outcome of self-poisoning. The observation made from this study included one hundred cases of self-poisoning admitted in medicine units of Dhaka Medical College Hospital on a given period of time.

Forty six percent of patients were within 11-20 years and 31% within 21-30 years of age, i.e. 77% of the total population under the study was within 11-30 years of age. A study by Begum J. A showed similar results where poisoning patients were within 11-30 years age group (64% in 1985 and 65% in 1986) admitted in four general hospitals in Chittagong division.[11] Similar results were also observed in the published data of Director General of Health Services where more than 62% of patients were above 16 years of age.[4] The mean age±SD of total poisoning cases in our study was 24.9±3.8 years and age-ranged from 13 to 60 years. This data also shows similarity with a study in Dhaka Medical College Hospital in 1994 where mean age was 25.17 years.[12] Though more common in second and third decade, self-poisoning cases are increasing in later age group also.

Most of the victims of this study were female (62%) in comparison to male (38%). Azhar M.A showed in a retrospective study of three year period at Jhenidah District Hospital that male female ratio was 1:2.26.13A different picture was found in another study by Rahaman and co-workers where male female ratio was 1.6:1.12

Self-poisoning was most common among married (65%) in comparison to unmarried (34%). A study on 2003 in rural India also showed that 63% victims of self-poisoning were married.[14] Marital disharmony is the prime cause.

Most of the patients were from low socio-economic condition (54%), where 38% were from middle-class. House-wives comprises one-third of the total population of self-poisoning (33%), followed by students (22%), 4% farmer, 6% service- holder, 7% day-laborer, 8% garments workers and 8% unemployed. These findings showed similarities with the findings of a study in Chittagong Medical College Hospital, where 25.8% were house-wife, 16.1% students, 12.9% day-laborer, 15% service-holder, 14% farmer.[15] The relatively lower rate of farmers in our study was probably due to the reason that most of the patients under this study were from Dhaka or suburban areas.

Majority of incidence (87%) occurred in their own home and 13% outside. Most likely cause was that the victim chosen a safe place in case of suicidal or self-harm or they accidentally took any poison or chemical kept in home.

In 53% of cases the mode of poisoning was suicidal, 16% accidental and 31% as a part of deliberate self-harm. Another study in Dhaka Medical College Hospital showed that 78.78% cases were suicidal poisoning and 6.43% accidental and 12.22% cases were stupefying in nature and suicidal poisoning was common in 21-30 years age group (56.91%).[12] Intentional drug overdose in the context of self-harm is common in both developed and developing countries. Accidental poisoning is also common, especially in children and the elderly.[9]

Various substances are used as poisoning materials ranging from organophosphorus compounds to very common household substances or drugs. In this study, it was observed that insecticides (organophosphorus compounds, carbamates etc.) were the most commonly used agent (34%). Other agents used were rat killer poison i.e. 2% zinc phosphide (7%), harpic (7%), savlon (3%), benzyl benzoate lotion (4%), copper sulphate (4%). Sedative, antipsychotic and antidepressant drugs are very common. Benzodiazepine was used by 13% victims. These agents are cheap and easily available in drugs stores and young people can collect very easily. Antipsychotics (8%) were used by those who took these drugs for psychiatric illness. Acid is an agent of accidental poisoning. There were three cases of accidental poisoning in this study. Mixed drug was used in 6% of cases. A study in Rangpur Medical College Hospital showed that organophosphorus compounds were used in 82.45% of cases, followed by diazepam 8.98%, datura 1.99%, acid 0.58%, kerosene 0.58%, alcohol 0.58%, detergent and hair lotion 1.27% cases.[16] Insecticide poisoning was relatively low in this study. It was probably due to most of the patients were from Dhaka and surrounding areas. People from agricultural background and low-income prefer insecticides as an agent. Time between and hospital admission was four hours in 63% of cases and all patients were admitted within 24 hours period. This observation was similar to the result of a study in Chittagong Medical College Hospital, where 44.5% of patients were admitted after four hours of incidence.[15]

Seven percent patients had previous history of drug or substance abuse and 11% patients attempted to commit suicide previously. There was history of psychiatric illness in 8% patients. Persons with psychiatric illness have a tendency to commit suicide. They usually use sedative-hypnotic drugs that were being used for their treatment.[9]

There was a diverse cause for self-poisoning. Familial disharmony (36%) was the commonest one. This group of people were married and majority were younger age group, although few cases were from middle-age group. There was female predominant, recently married, being neglected or battered by husband. Young boys and girls after quarrelling with parents or other members of family take drugs to take revenge and 17% of cases were within this category. Love affairs comprised 8% of cases especially among young girls, 16% cases were accidental and 14% people could not mention the exact cause of poisoning. One patient said that he took the poison because he was curious about the taste of the poison. A study on poisoning in district hospitals also revealed domestic trouble, dowry and poverty were the leading cause of poisoning. [13]

Majority (97%) of the patients were recovered fully, 2% were referred to other specialized unit due to complications. One patient died and was due to organophosphorus poisoning. This differs with different studies where mortality rate was high with organophosphorus poisoning. In a study in Rangpur Medical College Hospital, mortality rate with acute poisoning was 16.41% mainly due to organophosphorus compounds.[16] As most of the victims in our study could be hospitalized in a tertiary care hospital in time and they got prompt and appropriate management, mortality rate could be lessened. Mortality due to common household substance is nil. Death from a pure benzodiazepine overdose is rare. It usually occurs in conjunction with concomitant alcohol ingestion or use of another antipsychotic drug.[9]

Poisoning cases are neglected one. In this study, the patients were treated in very busy admitting units of a tertiary hospital. Poisoning patients are kept in veranda and many patients were managed in hospital floor especially in female ward. Hospital facilities, logistics and staffs could not cope with such number of patient. Young trainee doctors and nurses managed the patients with resource limitation.

Limitations of The Study

1. The study population was one hundred. Higher number of samples could give better information regarding self-poisoning.
2. If the samples were collected from different general hospital of different regions of country, more precise information could be found.
3. If the duration of study could be extended, more data could be collected.
4. Investigations especially urinary level of benzodiazepine could not be done in all patients with the history of such drug poisoning due to resource limitation.
5. If this study was continued throughout the country, the incidence and prevalence could be estimated better.

CONCLUSION

Self-poisoning is an important health care problem in hospital practice. The character of this poisoning has been changed over time for different reasons. People are using many household chemicals for committing suicide or doing self- harm. Accidental poisoning is also a problem especially if the agent is acid or caustic one. Though mortality rate is not so high, it has an impact on social and family environment.

Poisoning patients are neglected and mocked at. But there is clear reason behind most of the cases. Doctors, nurses, paramedics should be sympathized to these patients and proper counseling is necessary along with treatment to prevent further occurrence. To prevent accidental poisoning, electronic and print media can take part to spread awareness among people not to keep toxic substances in open place and should be clearly labeled. The facility of chemical identification of poisoning cases should be made available for more effective and specific treatment of patients rather than relying on supportive treatment only.

CONFLICT OF INTEREST

There was no potential conflict of interest to declare.

REFERENCES

1. Linden CH, Burns MJ. Poisoning and drug overdose. In: Braunwald E, Fauci AS, Kasper DL, et al. ed, Harrison's Principles of Internal Medicine. New York, Mc Grow Hill, 1996: 2595-2616
2. Minton NA, Murray VSG. A review of organo-phosphorus poisoning. Med Toxicol 1988; 3: 350-357.
3. Tafuri J, Roberts J. Organophosphorus poisoning. Ann Emerg Med 1987;16:193-202.
4. Bangladesh Health Bulletin 2001, UMIS, Directorate General of Health Services (2001), Dhaka.
5. Faiz MA. Organophosphorus compound intoxication. Medical Digest 1981: 62-63.
6. Faiz MA, Hasan M. Situation of poisoning in Bangladesh. Country Report in SAARC Meeting on Poisoning. Colombo, Srilanka (1999).
7. Eddleston M, Dawson A, Karalliedde L, et al. Early management after self- poisoning with an organophosphorus or carbamate pesticide – a treatment protocol for junior doctors. Critical Care 2004; 8: 391-397.
8. Baselt RC. Urine drug screening by immunoassay: Interpretation of result. In: Baselt RC, ed, Advances in Analytical Toxicology. Foster City, CA, Biomedical Publications, 2002: 81-123.
9. Jones AL. Acute poisoning. In: Haslett C, Chilvers ER, Boon NA, Colledge NR, ed, Davidson's Principles and Practice of Medicine. Oxford, UK, Churchill Livingstone, 2002: 166-184.
10. Ahmad R, Shah R, Amin MMM, et al. Pattern and mortality of poisoning in Dhaka Medical College Hospital. J Medical Teachers Federation 1995; 1(1): 10-12.
11. Begum JA. A study of poisoning in four hospitals in Bangladesh. Bang Med J 1989; 2: 60-64.
12. Rahaman MM, Khan GK. Clinical pattern of acute poisoning in medical units of Dhaka Medical College Hospital. J Dhaka Medical Coll 1994; 3(1): 1-5.
13. Azahar MA. Poisoning Cases in a District Hospital of Bangladesh. JOPSOM 1992; 11(2): 69-72.
14. B atra AK, Keoliya AN, et al. Poisoning: an unnatural cause of morbidity and mortality in rural India. J Assoc Physicians India 2003; 51: 955-959.
15. Faiz MA, Rahaman MR, Ahmed T. Management of acute poisoning with organophosphorus insecticides. J Bang Coll Phys Surg 1994; 12: 59-62.
16. Nag MN, Latif MA. A study on poisoning cases. Our experience in Rangpur Medical College Hospital. Northern Medical Journal 1998; 7(1):1-4.

Original Article

Frequency and Trends in Antimicrobial Susceptibility Pattern of Methicillin Resistance Staphylococcus aureus on Clinical and Carrier Isolates in a Tertiary Care Hospital

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ABSTRACT

Antibiotic resistance is a major clinical problem in treating infections caused by pathogenic micro-organism. Many bacteria develop resistant to routinely used antibiotics; among them Methicillin resistant Staphylococcus aureus *(MRSA) is one of the dangerous and emerging problems in treating infection in current world. Our present study was undertaken to isolate the MRSA from patients with wound infection and also from working health care providers in different surgical wards of hospital, with a view to determining the frequency and current trends in antibiotic sensitivity pattern of MRSA to different antibiotics.*

200 admitted patients and 200 health care providers were enrolled in this study of the Rajshahi medical college hospital, from July, 2013 to June, 2014. Out of 1000 samples, 200 wound swab as well as 200 nasal and 200 nail swabs were obtained from the patients admitted in surgery department, whereas 100 nasal and 100 nail swabs were collected from each 100 doctors and 100 nurses respectively working in the same ward. From different types of specimen 182 S. aureus *were isolated, of which 24.18% were MRSA. Among isolated MRSA bacteria, 59.09% were isolated from wound, 10.71% from nose and 6.25% from nail of patients; 30.77% from nose and 11.11% from nail of doctors and 40% from nose and 14.29% from nail of nurses. Highest rate of MRSA isolates were found in >60 years in case of patient and 36-50 years in case of health care providers. Antibiotic resistance patterns of MRSA isolates to ampicillin, amoxiclav, cotrimoxazole, gentamicin, ciprofloxacin, erythromycin, cloxacillin, cephradine, tetracycline, vancomycin and fusidic acid were 100%, 84.09%, 93.18%, 52.27%, 54.55%, 68.18%, 100%, 93.18%, 54.55%, 0% and 3.13% respectively. There were high resistant rate to commonly used antibiotics. So, appropriate and judicial use of antibiotics by doing culture and sensitivity test prior to the treatment may help to control the issue.*

Keywords: *MRSA,* S. aureus, *antibiotic resistance, antibiotic susceptibility*

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INTRODUCTION

Staphylococcus aureus is both a human commensal and a frequent cause of clinically important infections varies widely ranging from minor skin infections to fatal necrotising pneumonia. About 30% of healthy individuals are colonised asymptomatically with *S. aureus* in nose and skin, has been associated with subsequent infection[1] and *S. aureus* has outstanding ability to acquire resistance to antibiotics.

Methicillin was used to treat the penicillin-resistant strain of *S. aureus*. But methicillin resistance in *Staphylococcus aureus* was first reported in 1961 by Jevons, two years after the introduction of the drug[2]. Afterwards, MRSA spreads worldwide over the next several decades and is now endemic in most hospitals and health-care facilities in developed and developing countries.

The prevalence of MRSA within the hospital environment has increased now a days. In Bangladesh the frequency of MRSA is alarming due to indiscriminate and expanded use of antimicrobial drugs outside the hospitals. In 1991, 62.61% MRSA was reported[3], in 2002, 47.2% MRSA was reported[4] and in 2011 the prevalence of MRSA in Dhaka city was 43‡48%[5]. Whereas, in India it was 54.85%, in Nepal was 69.1% and in Pakistan was 29% [6].

MRSA is usually introduced into an institution by a colonized or infected patient or healthcare worker. Infected and colonized patients provide the primary reservoir and healthcare workers are the major source of MRSA in the hospital environment and healthcare workers are being more commonly identified as links in the transmission of MRSA between the patients[7]. Indiscriminate use of antibiotics, prolonged hospital stay, intravenous canalization, and catheterization, colonization of MRSA in nose, axilla, perineum, groin and hands are the important risk factors for the acquisition of MRSA infection. These findings are suggestive of screening efforts focus on healthcare workers with symptomatic infection is likely to miss a large number of asymptomatic personnel capable of transmitting MRSA to patients.

MRSA is also called oxacillin resistant *Staphylococcus aureus* (ORSA) or superbug. MRSA is any strain of *Staphylococcus aureus* that has developed, resistance to â-lactam antibiotics, which include the penicillins (methicillin, dicloxacillin, nafcillin, oxacillin, etc.) and the cephalosporins but often is susceptible to vancomycin. Newer drugs such as linezolid, daptomycin, and tigecycline and combination like quinpristin or dalfopristin may be effective against MRSA .

Now a days the focus of medical science, this issue got extreme importance throughout the world as well as in Bangladesh.

MATERIALS AND METHODS

An observational cross sectional study was carried out in the Department of Microbiology, Rajshahi Medical College, Rajshahi, for a period of one year from July 2013 to June 2014.

A pair of clinical specimen were collected from the wounds of the patients; anterior nares and nail beds of both hands of patients, doctors and nurses.

182 isolates of *S. aureus* were analyzed from both genders and all age groups of in-patients hospitalized in surgical wards as well as working health care providers in those wards. Our study population did not include outdoor and daycare surgical patients or patients with cancer related surgical wound; health care providers included only those were working in surgery indoor wards of hospital.

For isolation of Staphylococcus aureus, one swab was used for microscopy after gram staining and another swab was inoculated in nutrient agar, blood agar and mannitol salt agar media for culture. Antimicrobial susceptibility testing of the isolates were performed by using modified Kirby-Bauer disc diffusion method against ampicillin, amoxiclav, oxacillin, cotrimoxazole, gentamicin, ciprofloxacin, erythromycin, cloxacillin, cephradine, tetracycline, vancomycin and fusidic acid and all *Staphylococcus aureus* isolates were tested to detect MRSA using oxacillin (1 ìg) disc.result was interpreted according to Clinical and Laboratory Standards Institute (2013)[8].

RESULT

From our different study population namely patient(200) and health care provider(200), a total 1000 swabs of wound, nose and nail were collected All the specimens were cultured on appropriate bacteriological culture media.

In patients, *S. aureus* and MRSA were identified as 22 (11%) and 13 (59.09%) accordingly in wound swab, 56 (28%) and 6 (10.71%) in nasal swab, 16 (8%) and 1 (6.25%) in nail swab. In doctors, *S. aureus* and MRSA were detected as 26 (26%) and 08 (30.77%) in nasal swab, 18 (18%) and 02 (11.11%) in nail swab respectively. In nurses, *S. aureus* and MRSA were detected as 30(30%) and 12 (40%) in nasal swab, 14(14%) and 02(14.29%) in nail swab accordingly. Among total samples, 182 (17.25%) and 44 (23.19%) were found as *S.aureus* and MRSA positive cases (Figure-1).

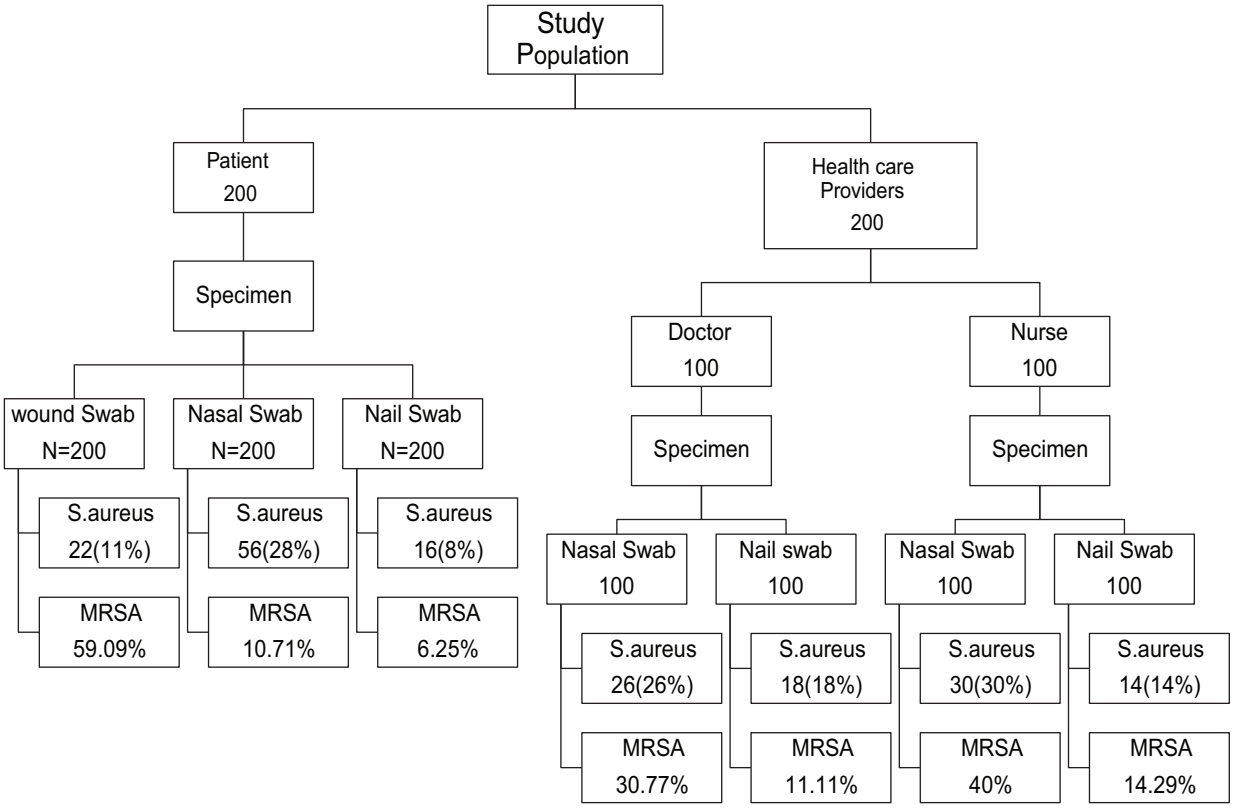

Table-1 shows the isolated *S. aureus* and MRSA in different specimens in combination. The maximum number of positive cases were found in wound and nose of patients where *S. aureus* were 14 and MRSA were 03; in nose and nail 06 were *S. aureus*; in wound and nail 03 were *S. aureus* and in wound, nose and nail 01 was *S. aureus*. In doctors, *S. aureus* was found in nose and nail of 08 cases but none was MRSA and in nurses, *S. aureus* was in 10 cases and 02 was MRSA. It was also observed that, *S. aureus* was common isolates of the population in nose and nail simultaneously.

Table-I : *Distribution of Staphylococcs aureus and MRSA in different specimens in combination*

Specimen	Number of cases							
	Patient n= 200		Doctor n=100		Nurse n=100		Total	
	S. aureus	MRSA	*S. aureus*	MRSA	*S. aureus*	MRSA	*S. aureus*	MRSA of Detected *S.aureus*
Nose and nail swab of same individual sample	06(3%)	00(0%)	08(8%)	00(0%)	10(10%)	02(20%)	24(6%)	02(8.33%)
Wound and nose swab of same individual sample	14(7%)	03(1.5%)	-	-	-	-	14(3.5%)	03(21.42%)
Wound and nail swab of same individual sample	03(1.5%)	00(0%)	-	-	-	-	03(0.75%)	00(0%)
Total							**42**(10.5%)	**05**(11.9%)

Figure-2 presents the distribution of MRSA among different age groups of patients with positive wound, nasal and nail swab culture. The age range was 1 to 60 years and it was divided into 5 age groups e.g. 1 to 15 yrs, 16 to 30, 31 to 45, 46 to 60, and above 60 years. Of the patients' 600 sample, the highest (17.95%) MRSA isolates were detected in the age group of above 60 years followed by 46-60 years (4.76%), 31-45 years (2.05%) and 1.61% in 16-30 years age group. In our study the lowest rate of MRSA isolates (1.33%) were observed in 1-15 years age group of patients.

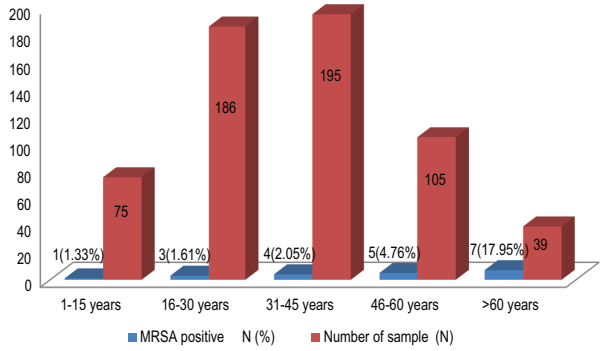

Fig.-2: *Distribution of MRSA in different age group of patients*

Figure-3 shows the distribution of MRSA isolates among the 3 age groups of doctors and nurses. The age range was 20 to 65 years and it was further divided into 3 age groups e.g. 20 to 35, 36 to 50 and 51 to 65. Of the doctors' 100 sample, the highest

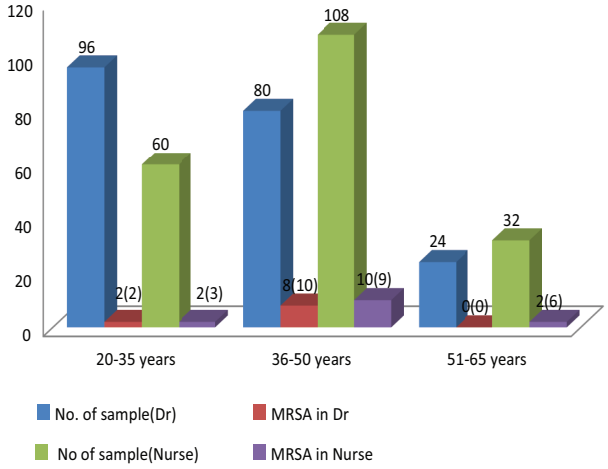

Fig.-3: *Distribution of MRSA in different age group of doctors and nurses*

percentage (10%) of MRSA isolates were detected in the age group of 36-50 years followed by 20-35 years (2%). No MRSA isolates were identified in 51-65 years group of doctors. Of the nurses' 100 sample, the highest percentage (9%) lies in the 36-50 years age group followed by 51-65 years (6%) age group and 20-35 years (3%) group.

The antibiotic susceptibility patterns of Methicillin Resistant *Staphylococcus aureus* (MRSA) to eleven antibiotics tested are shown in Table-2. A total of 182 *S. aureus* isolates were subjected to antibiotic susceptibility test against 11 antimicrobial drugs. Analyzing the antibiotic susceptibilities tested with the 44 isolates of MRSA, it showed 100% resistant to ampicillin and cloxacilin, 93.18% to co-trimoxazole and cephradin, and 84.09% to amoxiclav. The resistance rate of MRSA to gentamicin, ciprofloxacin and tetracycline ranges from 52% to 55%. Fortunately in MRSA isolates, the resistance rate to vancomycin and fusidic acid were 0% and 3.13% only represents the most effective drugs in the treatment of MRSA infection.

DISCUSSION

Detection of methicillin resistant *Staphylococcus aureus* (MRSA) is important for patient care and appropriate utilization of infection control measure. MRSA is a significant pathogen that emerged over the last four decades, causing both nosocomial and community-acquired infections. Rapid and accurate detection of MRSA and their resistance pattern to other antibiotics, is important for the use of appropriate antimicrobial therapy and for the control of nosocomial spread of MRSA strains. In a multicentre study in Bangladesh revealed that MRSA cases were from 32.0% to 63.00%. Another study in Bangladesh in 2005 showed that the incidence of MRSA has greatly increased over the last 4-5 years in different hospitals of various regions [9].

In the present study isolated *S.aureus* in wound swab of patients is 22 (11%) [Figure-1]. This finding is near to the findings of Jahan *et al*. (2004)[10] in Bangladesh and Kamat (2008)[11] in India and their isolation was 17.60% and 19.70% respectively. Among *S. aureus* in wound swab of patients, 59.09% are MRSA. Our study is similar with Akhter *et al.*(2009)[12] in Pakistan (66.66%) and Khan *et al*. (2007)[13] and Aftab (2011)[14] in Bangladesh, 62.5% and 66.67% respectively. But higher (88.3%) finding was reported by Jahan *et al.*

(2004)[10] in Bangladesh and lower (16.27%) finding by Singh *et al*. (2012)[15] in India. This difference might be due to MRSA infection is variable from different hospitals, geographic location and antibiotic policy.

Out of 56 *S. aureus* isolated in patients' nasal swab, 10.71% are MRSA. Our MRSA finding is similar to the study conducted in Taiwan[16] and in Germany[17]. Their observations were 9.48% and 12% respectively. In patients' nail swab, 6.25% are MRSA. The lower isolation of *S.aureus* and MRSA may be due to improper collection of specimen though we used wet swab stick for collection as nail is dry area.

Hospital worker are more likely to be colonized than persons in general population. Here, nasal carriage of *S. aureus* of doctors and nurses are 26% and 30%, among them MRSA is 30.77% in doctors and 40% in nurses. Different studies in Pakistan showed that nasal carriage of *S. aureus* were 48% and 18.2% by Farzana *et al.* (2008)[6], Akhter, (2010).[18] Another study in India[19] showed MRSA 33.3% in doctors and 54.1% in nurses. This difference may be due to it varies in geographical location, in different hospital environment even in different ward of same hospital. . It is observed that the nail carriage of MRSA in our study is lower than the nasal carriage.

Table-1 shows presence of *S. aureus* and MRSA in more than one site of body. In patient, 14 cases showed growth of *S. aureus* in wound and nose, of which MRSA are 3 cases. Similar type of study done in Chicago[20] and found 68% of the patients were positive for MRSA in the nasal and clinical samples together. In 06 patients, *S.aureus* is isolated from their nasal and nail swab simultaneously and in 03 patients isolated from wound and nail swab, reflecting a positive correlation between wound, hand and nasal carriage. In our study, 8 and 10 cases of *S.aureus* are isolated in doctors and nurses both in nasal and nail swab and MRSA is detected only in 2 nurses.

MRSA infection as well as nasal and hand carriage occurs at a higher incidence in elderly people owing to a weaker immune system. It is visible from this study that the age group of more than 60 years is the most (17.95%) sufferer and age group 1-15 years are the least (1.33%) sufferer (Figure-2).

Figure -3 shows the age related distribution of MRSA in doctors and nurses. More (10% and 9% in doctors and nurses) MRSA positive cases are seen in age group 36-50 years in both cases. This finding is similar to a study conducted in Nigeria[21]. Doctors and nurses of this age group are usually involved in hospital service and have to come in contact frequently with the patient with MRSA.

Because of its resistance to multiple antibiotics, management of MRSA infections requires more complicated and expensive treatment. In our study, MRSA strains are 100% resistant to ampicillin and cloxacillin and higher rate of resistance is shown in beta-lactam drug as well as in other commonly used drugs. Only vancomycin and fusidic acid are active against these isolates.

A study was conducted in Pakistan[12], which showed MRSA resistance rate to ampicillin is 100%, amoxiclav is 79.11%, co-trimoxazole is 96.8%, erythromycin is 70% and 0% to vancomycin. Another study by Bukhari *et al*[22]. showed gentamicin is 97.8%, ciprofloxacin is 72%, erythrormycin is 86.7%, cephradin 93% and tetracycline is 59.38% resistant. This varies from place to place, time to time and depends upon some factors like self medication and empiric use of antibiotics.

So, vancomycin and fusudic acid may be the drug of choice for the treatment of life threatening infection caused by multidrug resistant MRSA.

CONCLUSION

This study highlights the MRSA as a major cause of wound infection as well as high carriage rate among health care personnel in a tertiary hospital. Some of the patients with MRSA infected wound carry MRSA in their nose or hand. So, patients may be infected by themselves or by health care personnel. Methicillin resistant *S.aureus* induced wound infection is associated with morbidity, prolong hospitalization and increase treatment costs. Most of the commonly used antimicrobials are resistant to MRSA. So, an effective infection control program and regular surveillance of health care personnel can minimize this burden by reducing their transmission.

REFERENCES:

1. DeLeo FR, Otto M, Kreiswirth BN, Chambers HF. Community-associated meticillin-resistant Staphylococcus aureus. *Lancet* 2010; 375:1557-68.
2. Jevons MP. Celbenin-resistant staphylococci. *BMJ* 1961;1(5219):124-5.
3. Khan MA, Morshed MG, Khan WA and Aziz KMS. The emergence of methicillin resistant Staphylococcus aureus isolated from skin lesions. *Bangladesh J Microbiol* 1991; 8(1):21-25.

4. Rahman M, Hossain M, Samad TMA, Shahriar M, Zakaria MM. Prevalence of â-lactamase producing methicillin-resistant Staphylococcus aureus and antimicrobial sensitivity pattern. *Bangladesh Pharm. J* 2002; 12(2):1-4.

5. Haque ME, Shahriar M, Haq A, Gomes BC, Hossain MM, Razzak MA, Mazid MA. Prevalence of â-lactamase-producing and non-producing methicillin resistant Staphylococcus aureus in clinical samples in Bangladesh. *JMA* 2011; 3(5):112-18.

6. Farzana K, Rashid Z, Akhtar N, Sattar A, Khan JA, Nasir B. Nasal carriage of staphylococci in healthcare workers: antimicrobial susceptibility profile. *Pak J Pharm Sci* 2008; 21:290-4.

7. Safdar N, Maki DG. The commonality of risk factors for nosocomial colonization and infection with antimicrobial resistant Staphylococcus aureus, Enterococcus, Gram neative bacilli, Clostridium difficile and Candida. *Ann Intern Med* 2002; 136: 834-44.

8. Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing. Informational supplement M100-S23. Clinical and Laboratory Standard Institute, Wayne, PA.2013.

9. Haq JA, Rahman MM, Asna SM, Hossain MA, Ahmed I, Haq T, Morshed MA.Methicillin-resistant Staphylococcus aureus in Bangladesh—a multicentre study.*Int J Antimicrob Agents.* 2005; 25(3):276-7.

10. Jahan Y, Jahan F, Mamun KZ, Hossain MA, Shirin T, Sahman S, Gomes DJ. Emergence of methicillin resistant Staphylococcus aureus (MRSA) associated with wound infections. *Mymensingh Med J* 2004; 13(1):76-81.

11. Kamat US, Ferreira AMA, Savio R, Motghare DD. Antimicrobial resistance among nosocomial isolates in a teaching hospital in Goa. *Indian Journal of Community Medicine* 2008; 33(2):89-92.

12. Akhter R, Khan KMA, Hasan F.Isolation and antimicrobial susceptibility pattern of Methicillin Resistant and Methicillin Sensitive Staphylococcus Aureus. *Journal of Surgery Pakistan* 2009; 14 (4): 161-65.

13. Khan AH, Shamsuzzaman AKM, Paul SK, Alam MM, Mahmud MC, Musa AKM, Hossain MA, Ahmed MU, Ahmed AA. Antimicrobial Susceptibility and Coagulage. Typing of MRSA Strains at Mymensingh Medical College. *Bangladesh J Med Microbiol* 2007; 01(02):56-60.

14. Aftab S.Thesis- Pattern of Aerobic Bacterial Pathogens Causing Wound Infection at RMCH with Special Reference to MRSA and ESBL.

15. Singh NKR, Kalia K, Patel JS.A survey on prevalence rate & antibiotic susceptibility test (AST) pattern of Methicillin Resistant *Staphylococcus aureus* (MRSA) isolate from various types of clinical specimen & healthy hospital staff as carriers, Anand district. *JPBMS* 2012; 16(17):1-5.

16. Lai CF, Liao CH, Pai MF, Chu FY, Hsu SP, Chen HY, *et al.*Nasal carriage of methicillin-resistant Staphylococcus aureus is associated with higher all-cause mortality in hemodialysis patients.*Clin J Am Soc Nephrol*. 2011; 6(1):167-74.

17. Lederer SR, Riedelsdorf G, Schiffl H. Nasal Carriage OF Methicillin Resistant Staphylococcus Aureus: The Prevalence, Patients At Risk And The Effect Of Elimination on outcomes among outclinic haemodialysis patients. *Eur J Med Res* 2007; 12: 284-88.

18. Akhtar N. Staphylococcal nasal carriage of health care workers. *J Coll Physicians Surg Pak*. 2010; 20(7):439-43.

19. Kalyani K, Jayakumar K, Kumar S. Prevalence of Methicillin-Resistant Staphylococcus aureus Among Health Care Workers of Shri Satya Sai Medical College and Hospital - A Tertiary Care Centre. *JDMS* 2012; 3(2):23-7.

20. Robicsek A, Mira Suseno M, BeaumontJL, Richard B. Thomson RB,Peterson LR. Prediction of Methicillin-Resistant Staphylococcus aureus Involvement in Disease Sites by Concomitant Nasal Sampling. *J. Clin. Microbiol.*2008; 46(2): 588-92.

21. Fadeyi A, Bolaji BO, Oyedepo OO, Adesiyun OO, Adeboye MAN, Olanrewaju TO. Methicilin Resistant Staphylococcus aureus Carriage amongst Healthcare Workersof the Critical Care Units in a Nigerian Hospital. *Am. J. Infect. Dis*2010; 6 (1):18-23.

22. Bukhari SZ, Ahmed S, Zia N. Antimicrobial Susceptibility Pattern of Staphylococcus Aureus on clinical Isolates and efficacy of laboratory tests to diagnose MRSA: A Multi-celtre study. *J Ayub Med Coll Abbottabad* 2011; 23(1):139-42.

Original Article

Role of Maternal Oral Hydration Therapy in Increasing Amniotic Fluid Volume in Pregnant Women with Oligohydramnios

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ABSTRACT

The effect of maternal oral hydration with water on amniotic fluid volume was evaluated in pregnant women with oligohydramnios (Amniotic Fluid Index, [AFI] <5cm) .Thirty five (35) pregnant women with oligohydramnios were made to drink 2 litres of water every day for 7 days (hydration group), while 35 women in control group were not given oral hydration.. The AFI of pre-and posttreatment of oral hydration were compared between the two groups. The data were analyzed by using SPSS for statistical significance. The mean AFI in the hydration group increased significantly by 2.01 ± 3.73cm

Keywords: *Maternal, oral hydration, amniotic fluid index, oligohydramnios*

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INTRODUCTION

Amniotic fluid is a dynamic component that is continuously and closely related to both the mother and the fetus. It is an element of fundamental importance for the fetus. It is now universally accepted that a regular amniotic fluid volume is an essential requisite for adequate intrauterine development and a good neonatal outcome.[1] Oligohydramnios refers to amniotic fluid volume that is less than expected for gestational age (presence of less than 300 ml of amniotic fluid at term). Oligohydramnios occurs in about 4 to 5% of pregnancy and is threatening to fetal health. It is typically diagnosed by ultrasound examination and may be described qualitatively (e.g, normal, reduced) or quantitatively (e.g., amniotic fluid index [AFI] <5). Decreased AF may be responsible for fetal and umbilical cord compression, meconium staining, increased perinatal mortality and morbidity, and operative delivery.[2] The clinical need to increase amniotic fluid volume in pregnancy with oligohydramnios has prompted research into its normal regulation. Amniotic fluid volume is the result of a balance between its absorption and production. Various factors have been described to be involved in this dynamic process, the most well-known being fetal urination and swallowing. Recent studies on pregnant women with oligohydramnios demonstrated that maternal oral hydration seems to increase amniotic fluid volume.[3] The mechanism that produce this amniotic fluid volume change is through reduction in maternal plasma osmolality which in turn leads to a rise in Amniotic Fluid Index (AFI).[4] Amnioinfusion, intravenous fluid therapy also have been used to improve AFI in pregnant women with oligohydramnios.[4] However, a noninvasive, easy method such as oral water intake, if effective, would be preferred. The objective of this study was to assess the effect of maternal oral hydration on oligohydramnios.

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OBJECTIVES

General objective:

- To find out the association between maternal oral hydration and changes in the volume of amniotic fluid

Specific objectives:

- To measure baseline Amniotic Fluid Index (AFI) of the study subjects.
- To treat the study subjects by oral hydration therapy.
- To measure AFI of the study subjects following oral hydration therapy.

MATERIALS AND METHODS

We conducted an interventional study on singleton pregnancy complicated by idiopathic oligo-hydramnios beyond 28 weeks of gestation, attending the out patients department of Obstetrics and Gynecology, Dhaka Medical College Hospital, Dhaka, from July 2012 to June 2013. Prior to commencement of this study the research was approved by the ethical committee. The aims and objectives of this study, the procedure and benefits were explained to the patients in easily understandable local language. Informed consent was taken from each patient. A total number of 70 subjects complicated by idiopathic oligohydramnios who fulfill the inclusion criteria were selected from the obstetrics and gynecology outpatient department of Dhaka Medical College Hospital. The subjects who were voluntarily agreed to include in the study, filled up the consent form and then the patients were taken to the radiology and imaging department for sonographic assessment. Oligohydramnios is diagnosed by using the amniotic fluid index (AFI<5cm). AFI is measured by summation of largest fluid pocket in the four quadrants of amniotic fluid. Thirty-five (35) patients were prescribed oral hydration therapy of 2000mL water/day for 7 days and control group were allowed to drink on demand. Women with diabetes mellitus, renal disease, ruptured membranes or with fetal malformations on ultrasound were excluded from the study. Only women with idiopathic oligohydramnios, AFI (5cm 0r less) were included in the study, and randomly divided into (1) hydration group and (2) control group, 35 cases in each group. The Amniotic fluid Index (AFI) of each group were measured after 7 days. The difference between the post- and pretreatment AFI were calculated, the data was analyzed with paired student t-test for statistical significance.

Inclusion Criteria

- Study inclusion criteria were, singleton pregnancy, well-established gestational age between 28 weeks to 35 weeks, intact membranes with moderate to severe oligohydramnios (AFI<5).

Exclusion Criteria

- Presence of maternal complications (anemia, cardiac disease, renal diseases, pre-eclampsia, hypertension, or diabetes); presence of ruptured membranes fetal structural malformation and/or distress.

Results

Among the 70 patients, 35 were given oral hydration and 35 were kept under observation without intervention. The results of different parameters are shown in the Table I. The mean age of the patients was 26 years. The gestational age ranges from 28 weeks to 35 weeks. The mean gestational age was 34 weeks. Parity ranges from 0 to 4. No drugs were used by the participants. The mean AFI of hydration group before oral hydration was 4.657±.359 and after hydration was 5.886±.595, average AFI increase was 26%. Pretreatment AFI in control group was 5.157± .379 and after 7 days it was 5.354±.518, there was only 4% increase in AFI. Data on AFI, mean and standard deviation (SD), both before and after oral hydration are summarized on the Table-II. Among 35 intervention group 20 (57.15%) patients delivered vaginally, 15(42.85%) patients delivered by cesarean section and among nonintervention group, 13 (37.14%) patients delivered vaginally and 22 (62.86%) patients delivered by cesarean section.

Table 1: Results of different parameters

Characteristic	Intervention group (n = 35)	Control group (n =35)
Maternal age	21.1 ± 8.0	20.3 ± 6.7
Parity	2.5 ± 1.0	1.3 ± 1.5
Gestational age	31.5 ± 1.2	31.4 ± 1.3
Gestational age at birth	39.5 ± 1.1	39. 4 ± 1.3
Cesarean delivery rate,%(N)	42.85%) (15/35	62.86% (22/35)
Vaginal delivery rate%(N)	57.15% (20/35)	37.14% (13/35)

Table 2: *The effect of maternal hydration in women with oligohydramnios. (n=70)*

	Pre-treatment AFI (in cm) Mean+SD		Post treatment AFI (in cm)		P value
Hydration group (N=35)	4.657±.359	(Range-4 to5 cm)	5.886±595	Range- 5.5 to 6.6 cm)	P<0.001
Control group N (=35)	5.157± .379	(Range-4 to 5 cm)	5.354±.518	(Range-4.8 to 5.8)	P0.77

Values are mean ± SD. AFI indicates amniotic fluid index.

Interpretation

Maternal oral hydration was associated with a significant increase in AFI. The AFI increased by a mean of 2.01 ± 3.73cm after oral hydration. The Cochrane Library (Oxford) search of the Cochrane Pregnancy and Childbirth Group Trials register and the Cochrane Controlled Trials Register showed only two studies of 77 women, with and without oligohydramnios (Hofmeyr, 2002).[5] The women were asked to drink two liters of water before having an ultrasound. Acute maternal hydration was associated - with increase in amniotic fluid volume (weighted mean difference for women with normal amniotic fluid volume 4.5, 95°/r, confidence interval 2.92 to 6.08). No clinically important outcomes were assessed. The reviewer's conclusion was that simple maternal hydration appears to increase amniotic fluid in women with normal AFV. It may be beneficial in the management of oligohydramnios in pregnancy. Comparison of the effect of three methods of maternal hydration on the AFI in oligohydramnios: IV 1sotonic fluid (2 litres/2 hours), IV hypotonic fluid (2 litres/2 hours) and oral water intake (2litres/ 2 hours) demonstrated significant increase in amniotic fluid volume with IV hypotonic fluid infusion and oral water intake only (2.8 ± 1.9).

DISCUSSION

Maternal oral hydration with 2 litres of water (Hypotonic solution) in women with oligohydramnios was associated with increasing AFI. This finding suggests that maternal hydration status has an important role to play in the normal regulation of amniotic fluid volume, besides other factors such as fetal urination and fetal swallowing. Amniotic fluid volume regulation and response to fluid infusion or withdrawal has been studied in animal, but very few studies have been carried out in humans. Oral water loading and arginine-vasopressin induced decreased maternal plasma osmolality decreases ovine fetal osmolality, with subsequent increase in fetal urine flow rate and increase m amniotic fluid volume.[6] Maternal hydration and the reset (lower) maternal and fetal plasma hypotonicity results in suppression of spontaneous fetal swallowing activity in ewes, probably from tonic stimulation.[7] Fetal swallowing being a major route of amniotic fluid resorption, suppressed swallowing activity increases amniotic fluid volume.. Fetal congenital anomalies were excluded as they may affect the formation of amniotic fluid. Maternal oral hydration therapy significantly increases the AFI, reduces the caesarean section rate and improves the fetal outcome.[8] Available data suggests that maternal oral hydration may be a safe, well-tolerated and useful strategy to improve AFV especially in cases of oligohydramnios.[9]

LIMITATIONS OF THE STUDY

This was a single center study with small sample size. So, the study results might not be reflected in the whole community.

CONCLUSION AND RECOMMENDATIONS

From the study, it was concluded that maternal hydration status has a definite role in amniotic fluid regulation and oral hydration increases amniotic fluid volume in oligohydramnios. Maternal hydration with hypotonic solution (water) causes osmotic change, which relates to parallel decrease in fetal osmolality, increased fetal urine flow and formation of amniotic fluid. Early detection of oligohydramnios and its corrections by simple oral hydration is found to improve perinatal outcome by increasing amniotic fluid volume by fetal diuresis and improving placental perfusion. Oral hydration therapy is cost effective, easy method, without having side effects and with a successful outcome.

REFERENCES

1. Tito Silvio Patrelli, MD, Salvatore Gizzo, MD, Erich Cosmi, MD, Maria Giovanna Carpano, MD, Maternal Hydration Therapy Improves the Quantity of Amniotic Fluid and the Pregnancy Outcome in Third-Trimester Isolated Oligohydramnios ©2012 by the American Institute of Ultrasound in Medicine.

2. Ghafarnejad M1, Tehrani MB, Anaraki FB, Mood1 NI, Nasehi L. Oral hydration therapy in oligohydramnios J Obstet Gynaecol Res. 2009 Oct;35(5):895-900. doi: 10.1111/j.1447-0756.2009.01043.

3. Nahid Lorzadeh, Sirous Kazemirad, Mina Lorzadeh **and** Sahid Najafi Comparison of the Effect of Oral and Intravenous Fluid Therapy on Women with Oligohydramnios Research Journal of Obstetrics and Gynecology Volume 1 (1): 25-29, 2008.

4. Marzieh Ghafarnejad, Mehrnaz Barzi, Tehrani ,Fatemeh Baradaran, Anaraki Narges, Izadi Mood et.al. Oral hydration therapy in oligohydramnios. The Journal Obstetrics and Gynecology Research First published:23 October 2009 https://doi.org/10.1111/j.1447-0756.2009.01043.x

5. Hofmeyr GJ, Gülmezoglu AM Maternal hydration for increasing amniotic fluid volume in oligohydramnios and normal amniotic fluid volume. Cochrane Database Syst Rev, (2):CD000134, 01 Jan 2002.

6. Zakaria Nada, Mbbch, M.Sc., M.D. Oral and Intravenous Maternal Hydration in third trimester Idiopathic Oligohydramnios: Effects and Duration. IOSR Journal of Nursing and Health Science (IOSR-JNHS) e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 4, Issue 5 Ver. I (Sep. - Oct. 2015), PP 22-25.

7. Doi Shigeharu MD; Osada, Hisao MD; Seki, Katsuyoshi MD; Sekiya, Souei MD; Maternal hydration with either IV hypotonic fluid or oral water ... Sildenafil Citrate Therapy for Oligohydramnios: A Randomized Controlled Trial. Obstetrics & Gynecology: October 1998 - p 525-529.

8. Akter MD[1], Kabir N, Shah MS, Islam F, Tasnim S. Mymensingh Med J. 2012 Oct;21(4) Effect of maternal oral hydration therapy in oligo-hydramnios. Mymensingh Medical Journal: MMJ, 01 Oct 2012, 21(4):723-8.

9. Salvatore Gizzo, Marco Noventa, Amerigo Vitagliano, Andrea Dall'Asta, Donato D'Antona, Clive J. Aldrich, An Update on Maternal Hydration Strategies for Amniotic Fluid Improvement in Isolated Oligohydramnios and Normohydramnios: Evidence from a Systematic Review of Literature and Meta-Analysis. Published: December 11, 2015 https://doi.org/10.1371/journal.pone.0144334.

Original Article

A Comparative Study on Glycemic Control by Combination Therapy of Gliclazide-Metformin Versus Insulin in Type 2 Diabetes Mellitus Patients

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ABSTRACT

Background: *Diabetes mellitus is one of the most common non-communicable diseases worldwide, which requires management of the symptoms via lifestyle modification and anti-diabetic pharmacotherapies. Purpose of this study was to compare the effects on glycemic control by combination therapy of gliclazide-metformin versus insulin in type 2 diabetes mellitus patients according to baseline HbA1c, fasting blood glucose and blood glucose 2 hours after breakfast.*

Materials and methods: *An interventional study was conducted at Endocrinology Outpatient Department of Dhaka Medical College Hospital, Dhaka and Outpatient Department of Ibrahim General Hospital, Mirpur, Dhaka over a period of one year (July 2018 to June 2019). Total 110 type 2 diabetic patients were selected purposively. The patients were divided into two groups. In group I, 55 patients treated with gliclazide (80mg) and metformin (500mg) combination therapy twice daily for consecutive 12 weeks and in group II, 55 patients treated with Insulin (premixed 30/70) twice daily for consecutive 12 weeks.*

Results: *After 12 weeks of treatment HbA1c level reduced from (mean ± SD) 8.94 ± 0.91 to 7.82 ± 1.86 in group I and 10.07 ± 1.28 to 7.90 ± 1.01in group II. FBG level reduced from 10.05 ± 1.57 to 7.96 ± 1.62 in group I and 11.61 ± 2.62 to 7.60 ± 1.23 in group II. Blood glucose 2 hours ABF level reduced from 14.00 ± 2.04 to10.99 ± 1.41 in group I and 16.70 ± 3.61to 10.71 ± 1.52 in group II. In group I, 36.4% patients achieved HbA1c target level, 40% patients achieved FBG target level and 25.5% patients achieved blood glucose 2 hrs ABF target level. In group II, 29.1% patients achieved HbA1c target level, 56.4% patients achieved FBG target level and 29.1% patients achieved blood glucose 2 hrs ABF target level. But on comparison there was statistically no significant difference between two groups.*

Conclusion: *On the basis of the study findings patients of both study groups have showed improvement in the overall glycemic control (HbA1c, FBG and blood sugar 2hours ABF) during the study period. On comparison between two groups there was statistically no significant difference but individual group has unique beneficial effect.*

Keywords: *Type 2 diabetes mellitus, hemoglobin A1c, fasting blood glucose, blood glucose 2 hours after breakfast.*

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INTRODUCTION:

Diabetes mellitus is a metabolic disease characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both. Symptoms of hyperglycemia include polyuria, polydipsia, polyphagia, weight loss and blurred vision. Complications of diabetes include retinopathy, nephropathy, peripheral neuropathy. Patients with diabetes have an increased risk of atherosclerotic, cardiovascular, peripheral arterial and cerebrovascular disease.[1] About 425 million people have diabetes in the world and 82 million people in the South East Asian Region; by 2045 this will rise to 151 million. The prevalence of diabetes is increasing in Bangladesh both in urban and rural

areas. Majority of adult population in Bangladesh have type 2 diabetes and they are in risk to develop diabetic complications early.[2]

Most adults with diabetes have at least one comorbid chronic disease and up to 40% have at least three. Up to 75% of adults with diabetes also have hypertension. Other common comorbidities of diabetes are dyslipidemia, cardiovascular disease, kidney disease, non-alcoholic fatty liver disease and obesity.[3] Type 2 diabetes is the most common form of diabetes mellitus which accounts for 90% to 95% of all diabetes patients. Lifestyle has a great importance to development of type 2 diabetes mellitus such as obesity, sedentary life style, physical inactivity, smoking, alcohol consumption.[4] Dietary and Life style modification are the first approach to maintain optimum glycemic control. If the desired level of glycemic control is not achieved with diet and exercise, pharmacological intervention is required. Oral and injectable anti diabetic drugs are used on the basis of effectiveness, cost, risk of hypoglycemia, weight gain and patients preference.[5]

Metformin is established as first line monotherapy. It reduced hepatic glucose production, increasing uptake and utilization of glucose in tissues and improve insulin sensitivity in type 2 diabetic patients. Metformin does not cause weight gain and hypoglycemia. Gliclazide is a second generation sulfonylurea drug. It stimulates the production of insulin from beta cell of pancreas and improves insulin resistance in peripheral target tissues. It causes hypoglycemia and weight gain.[6] Metformin plus gliclazide combination therapy is effective at improving glycemic control in patients with type 2 diabetes insufficiently controlled by monotherapy.[7]

Insulin therapy reduces microvascular complications and lowers macrovascular risk in type 2 diabetes. Weight gain and hypoglycemia is associated with insulin therapy. Hypoglycemia may occur from a mismatch between insulin and diet.[8]

This study gives an idea about effects on glycemic control by combination therapy of gliclazide-metformin versus insulin in type 2 diabetes mellitus patients.

MATERIALS AND METHODS:

This interventional hospital-based study was conducted at Endocrinology Outpatient Department of Dhaka Medical College Hospital, Dhaka and the Outpatient Department of Ibrahim General Hospital, Mirpur, Dhaka. The study was carried out over a period of one year (July 2018 to June 2019). Ethical clearance was taken from ethical review committee of Dhaka Medical College Hospital and Ibrahim General Hospital authority. Total 110 type 2 diabetic patients (age 30 – 70 years) were selected purposively. The patients were divided into two groups. In group I, 55 patients treated with gliclazide (80mg) and metformin (500mg) combination therapy twice daily for consecutive 12 weeks and in group II, 55 patients treated with Insulin (premixed 30/70) twice daily for consecutive 12 weeks.

Baseline data of glycemic status HbA1c, fasting blood glucose (FBG), blood glucose 2 hours after breakfast were recorded in a data collection form during first visit. About 110 patients were interviewed in each group and their baseline data were recorded during first visit. Then the patients were counseled for a follow up visit in the same diabetes center after 12 weeks with their investigation reports. After 12 weeks of initial visit patients came to the same diabetic centre for follow-up. In follow-up visit, information of HbA1c, fasting blood glucose (FBG), blood glucose 2 hours after breakfast and any history of hypoglycemia in last 12 weeks were recorded in the data collection form. During follow-up visit about 55 patients were dropped out in each group because some patients did not come in follow up and some did not have any investigations which were advised.

All relevant informations were collected, completed and compiled. Collected data was analyzed by SPSS 22.0. Student t-test and chi-square test were done. The p value ≤ 0.05 was considered as statistically significant at 95% CI (confidence interval).

RESULTS:

In this study mean age of the patients were 47.69 ± 8.58 years in group I and 50.78 ± 10.19 years in group II. Out of 110 cases male patients were predominant in both groups. In group I male were 31 (56.4%) and female were 24 (43.6%) and in group II male were 29 (52.72%) and female were 26 (47.27%). Most of the respondents were housewife 22 (40%) in both groups. In both groups 21 (38.2%) respondents had completed their SSC. Large numbers of respondent have positive family history of diabetes mellitus. In group I family history positive 20 (36.4%) and in group II 23 (41.8%) respondents had positive family

history. In this study mean duration of diabetes of the patients were 3.93 ± 2.6 years in group I and 5.38 ± 4.96 years in group II.

In this study it was observed that after 12 weeks of treatment mean HbA1c level significantly reduced from 8.94 ± 0.9% to 7.82 ± 1.86% in group I and 10.07 ± 1.28% to 7.90 ± 1.01% in group II (Table 1 & Figure 1). After 12-weeks of treatment HbA1c 7.82 ± 1.86% in group I and 7.90 ± 1.01% in group II. On comparison between two groups, statistically no significant difference (p = 0.711). Mean FBG level significantly reduced from 10.05 ± 1.57 to 7.96 ± 1.62 in group I and 11.61 ± 2.62 to 7.60 ± 1.23 in group II (Table 2 & Figure 2). After 12-weeks of treatment FBG, 7.96 ± 1.62 in group I and 77.60 ± 1.23 in group II. On comparison between two groups statistically no significant difference (p = 0.186). Mean blood glucose 2hrs ABF level significantly reduced from 14.00 ± 2.04 to 10.99 ± 1.41 in group I and 16.70 ± 3.61to 10.71 ± 1.52 in group II (Table 3 & Figure 3). After 12-weeks of treatment blood glucose 2hrs ABF, 10.99 ± 1.41in group I and 10.71 ± 1.52 in group II. On comparison between two groups statistically no significant difference (p = 0.308).

Table I: *Changes in mean HbA1c before and after treatment.*

HbA1c (%)	Group I (n=55) Mean ± SD	Group II(n=55) Mean ± SD
Before Treatment	8.94 ± 0.91	10.07 ± 1.28
After 12- Weeks of treatment	7.82 ± 1.86	7.90 ± 1.01
p Value	0.001	0.001

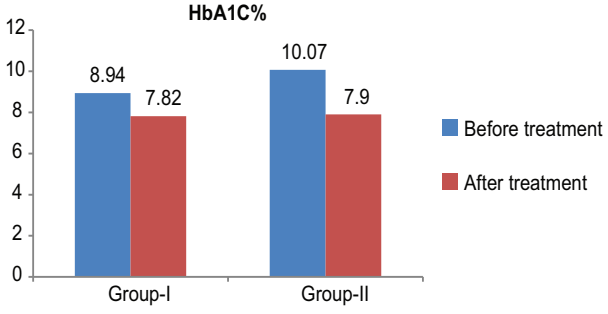

Fig.-1: *Changes in mean HbA1c before and after treatment.*

Table II : *Changes in mean fasting blood glucose (FBG) before and after treatment.*

Fasting Blood glucose level (mmol/L)	Group I(n=55) Mean ± SD	Group II(n=55) Mean ± SD
Before Treatment	10.05 ± 1.57	11.61 ± 2.62
After 12- Weeks of treatment	7.96 ± 1.62	7.60 ± 1.23
p Value	0.002	0.001

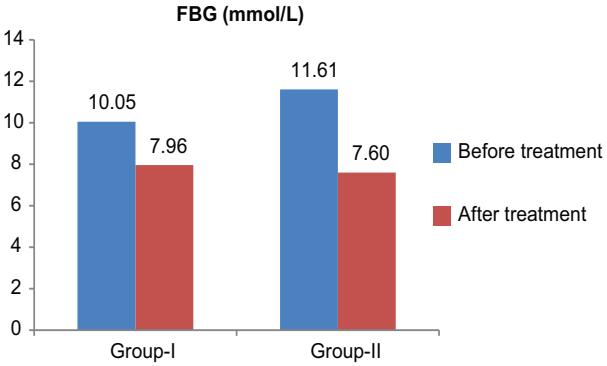

Figure 2: *Changes in mean fasting blood glucose (FBG) before and after treatment.*

Table 3: *Changes in mean blood glucose level 2 hours after breakfast before and after treatment.*

Blood glucose 2hrs ABF (mmol/L)	Group I (n=55) Mean ± SD	Group II (n=55) Mean ± SD
Before Treatment	14.00 ± 2.04	16.70 ± 3.61
After 12- Weeks of treatment	10.99 ± 1.41	10.71 ± 1.52
p Value	0.003	0.001

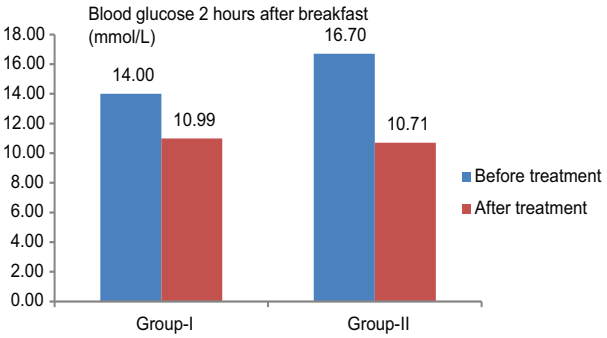

Figure 3: *Changes in mean blood glucose level 2 hours after breakfast before and after treatment*

In this study, target level of HbA1c was set <7%, FBG 4.4-7.2 mmol/l and blood glucose 2hrs ABF <10 mmol/l according to American Diabetes Association guideline 2019. In group I, 20 (36.4%) patients achieved HbA1c target level, 22 (40%) patients achieved FBG target level, 14 (25.5%) patients achieved blood glucose 2 hours ABF target level. In group II, 16 (29.1%) patients achieved HbA1c target level, 31 (56.4%) patients achieved FBG target level, 16 (29.1%) patients achieved blood glucose 2 hrs ABF target level. It was observed that 12 (21.8 %) patients had experienced hypoglycemia in group I and 15 (27.3%) patients experienced hypoglycemia in group II during the study period (Table IV).

Table 4: Individuals achieved target glycemic control (according to American Diabetic Association guideline) during study period.

Investigations	Duration of treatment 12 weeks			
	Group I (n=55)		Group II (n=55)	
	n	%	n	%
HbA1c (<7%)	20	36.4	16	29.1
FBG (4.4-7.2) mmol/l	22	40.0	31	56.4
Blood glucose 2hrs ABF (<10) mmol/l)	14	25.5	16	29.1

DISCUSSION:

This interventional hospital based study was carried out to compare the effects on glycemic control by combination therapy of gliclazide-metformin versus insulin in type 2 diabetes mellitus patients. This study showed highest respondents in age group 41 – 50 years which occupied 26 (47.3%) in group I and highest respondents in age group 51-60 years which occupied 17 (30.9%) in group II. These results are near to findings of Zakia, et al., 2013, in which that majority (50.7%) of patients was in age group 41-55 years.[9] Majority of patients were male. In group I male were 31 (56.4%) and in group II male were 29 (52.72%). Similar findings were found to the study done by Afroz, et al., 2019, which shown male 54.4% but Safita, et al., 2016, showed female patients (56.9%) are more than male patients (43.1%).[10,11] Educational status revealed maximum patients in both groups 21 (38.2%) respondents had completed their SSC. These results are near to findings of Latif, et al., 2017, in which that majority 34.6% were SSC.[12] In case of occupation, predominant occupation was housewife, 40% in both groups. These result are near to findings of Vanderlee, et al., 2016, in which that predominant occupation 56% was housewife[13]. In this study family history positive 20 (36.4%) in group I and in group II 23 (41.8%) respondents had positive family history. Similar findings were found to the study done by Afroz, et al., 2019, in which showed that 34.6% patients have a positive family history[10]. In this study showed that duration of diabetes was (Mean ± SD) 3.93 ± 2.6 years in group I and 5.38 ± 4.96 years in group II, which was around similar to the done by Zakia, et al., 2013, where duration of diabetes was (Mean ± SD) 6.3± 5.6 years.[9] Another study done by Afroz, et al., 2019, where duration of diabetes was (Mean ± SD) 10.7 ± 7.7 years.[10]

In this study it was observed that after 12 weeks of treatment mean HbA1c level significantly reduced from 8.94 ± 0.9% to 7.82 ± 1.86% in group I who were treated with metformin plus gliclazide and 10.07 ± 1.28% to 7.90 ± 1.01% in group II who were treated with premixed insulin. After 12-weeks of treatment, on comparison between two groups, statistically no significant difference (p = 0.711). Similar types of study was conducted by Vaughan, et al., 2017, in USA for 12 month found that there was significantly decreased HbA1c level by oral and insulin treated group. 11.25 ± 2.1% to 7.73 ± 2.1% in insulin group and 9.40 ± 2.1% to 7.22 ± 1.7% in oral group. But on comparison statistically no significant difference between two groups.[14]

Mean FBG level significantly reduced from 10.05 ± 1.57 to 7.96 ± 1.62 in group I and 11.61 ± 2.62 to 7.60 ± 1.23 in group II. After 12-weeks of treatment, on comparison statistically no significant difference (p = 0.186). This result is also similar to study done by Pasquel, et al., 2015 also showed that significant reduction of FBG in both group. But there was statistically no significant difference between oral group and insulin group[15]. Mean blood glucose 2hrs ABF level significantly reduced from 14.00 ± 2.04 to 10.99 ± 1.41 in group I and 16.70 ± 3.61to 10.71 ± 1.52 in group II. After 12-weeks of treatment, on comparison between two groups statistically no significant difference (p = 0.308). This result is also similar to the study done by Pasquel, et al., 2015 also showed that significant reduction of blood sugar 2 hrs ABF in both group. But there was statistically no significant difference between oral group and insulin group.[15]

In this study, target level of HbA1c was set <7% according to ADA guideline, 2019. 20 (36.4%) patients achieved HbA1c target level (<7%) in group I and 16 (29.1%) patients achieved HbA1c target level (<7%) in group II. Which was around similar to the study done by Pandit, 2016, in India also found that 7 of 26 patients (26.92%) of oral therapy achieved HbA1c target level (<7%) and 11 of 34 patients (32.35%) of premixed insulin therapy achieved HbA1c target level (<7%).[16] Respondents experienced more hypoglycemia who were treated with premixed insulin than with metformin plus gliclazide (27.3% and 21.8% respectively) in this study, which was around similar to the study done by Pandit, 2016, in India.[16]

CONCLUSIONS:

On the basis of the study findings both groups of drugs are effective in controlling blood glucose. On comparison between two groups there was statistically no significant difference but individual group has unique beneficial effect. Metformin and gliclazide combination therapy showed less hypoglycemic effect than premixed insulin so they may be prescribed to the patients who are prone to be hypoglycemic (elderly people, working people who do not take their meal properly). Premixed insulin causes higher reduction of HbA1c, FBG, blood glucose 2 hours ABF than metformin and gliclazide combination. So premixed insulin may prefer for patients in whom too strict glycemic control is needed.

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The authors have declared that no competing interest exit.

REFERENCES:

1. American Diabetes Association. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes. Diabetes care 2018; 41(1), pp.13-27.
2. Cho, N.H., Shaw, J.E., Karuranga, S., Huang, Y., Farnandes, J.D., Ohlrogge, A.W. et al. IDF Diabetes Atlas: Global estimates of diabetes prevalence for 2017 and projections for 2045. Diabetes Research and clinical practice 2018; 138, pp.271-281.
3. Manzella, D. How Comorbid Conditions Can Affect Your Diabetes Care 2019. Available at: https://www.verywellhealth.com/comorbidity-disease-diabetes-1087365. [Accessed on 30th November, 2019]
4. Wu, Y., Ding, Y., Tanaka, Y., Zhang, W. Risk Factors Contributing to Type 2 Diabetes and Recent Advances in the Treatment and Prevention. International Journal of Medical Sciences 2014; 11(11), pp.1185-1200.
5. Inzucchi, S.E., Bergenstal, R. M., Buse, J.B., Diamant, M., Ferrannini, E., Nauck, M. et al. Management of Hyperglycemia in Type 2 Diabetes, 2015: A Patient-Centered Approach: Update to a Position Statement of the American Diabetes Association and the European Association for the Study of Diabetes. Diabetes care 2015; 38(1), pp.140-149.
6. Stubbs, D.J., Levy, N., Dhatariya, K. Diabetes medication pharmacology. British Journal of Anaesthesis 2017; 17(6), pp. 198-207.
7. Hostalek, G.U., Schlachter, J., Geloneze, B. Combination Therapy with Metformin plus Gliclazide in Patient with Type 2 Diabetes. Journal of Diabetes Research and Therapy 2016; 2(3), pp.1-8.
8. Swinnen, S.G., Hoekstra, J.B., DeVries, J.H. Insulin Therapy for Type 2 Diabetes. Diabetes Care 2009; 32(2), pp.253-259.
9. Afroz, A., Alam, K., Ali, L., Karim, A., Alramadan, M. J., Habib, S. H. et al. Type 2 diabetes mellitus in Bangladesh: a prevalence based cost-of-illness study. BMC Health Services Research 2019; 19(601).
10. Zakia, S., Ali, M.A., Akther, M.S., Uddin, M.S., Haque, M.M. Study of Evaluation for the Management of Diabetes in Bangladesh. Pharmacology & Pharmacy 2013; 4, pp.355-361.
11. Safita, N., Alam, S. M., Chow, C. K., Niessen, L., Lechner, A., Holle, R. et al. The impact of type 2 diabetes on health related quality of life in Bangladesh: results from a matched study comparing treated cases with non-diabetic controls. Health and Quality of Life Outcomes 2016; 14(1).
12. Latif, Z.A., Ashrafuzzaman, S.M., Amin, M.F., Gadekar, A.V., Sobhan, M.J., Haider, T. A Cross-

sectional Study to Evaluate Diabetes Management, Control and Complications in Patients with type 2 Diabetes in Bangladesh. BIRDEM Medical Journal 2017; 7(1), pp.17-27.

13. Vanderlee, L., Ahmed, S., Ferdous, F., Farzana, F. D., Das, S. K., Ahmed, T. et al. Self-care practices and barriers tocompliance among patients with diabetes in a community in rulal Bangladesh. International Journal of Diabetes 2016; 36(3), pp.320–326.

14. Vaughan, E.M., Moreno, J.P., Hyman, D., Chen, T.A., Foreyt, J.P. Efficacy of oral versus insulin therapy for newly diagnosed diabetes in low-income settings. Arch Gen Intern Med 2017; 1(2), pp.17-22.

15. Pasquel, F.J., Powell, W., Peng, L., Johnson, T.M., Yarandi, S.S., Newton, C. et al. A randomized controlled trial comparing treatment with oral agents and basal insulin in elderly patients with type 2 diabetes in long-term care facilities. BMJ Open Diabetes Research and Care 2015; 3(1).

16. Pandit, A. Comparative effectiveness of multi oral antidiabetic drugs versus insulin therapy for glycemic control in type 2 diabetes mellitus. Asian Journal of Pharmaceutical and Clinical Research 2016; 9(1), pp.262-264.

Original Article

Cholesterol lowering effect of canola oil in hypercholesterolemic rats

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ABSTRACT

Background: *Dyslipidemia is a common metabolic disorder in clinical practice that may lead to a number of sequel including coronary heart disease (CHD), dermatological manifestations, pancreatitis, neurological and ocular abnormalities. Canola oil contain monounsaturated and omega 3 fatty acids which have beneficial effect on cardiac tissue with cholesterol lowering effect. The present study was performed to investigate cholesterol lowering effect of canola oil in hypercholesterolemic rats. This study was also compared the cholesterol lowering effect of canola oil with atorvastatin.*

Materials and Methods: *In this experimental study total thirty five (35) rats were divided into 5 groups containing 07 rats in each group (Group A, Group B, Group C, Group D, Group E). Group A was served as control group, was received normal diet and distilled water. Group B received normal diet, distilled water and olive oil 10% Cholesterol diet. Group C received normal diet, distilled water, 10% cholesterol and low dose canola oil(25 ml/kg body wt). Group D received normal diet, distilled water, 10% cholesterol diet and high dose canola oil (50 ml/kg body wt). Group E received normal diet, distilled water, 10% cholesterol and atorvastatin (1.3 mg/kg body wt). After 14days, blood sample of control and experimental groups were collected by cardiac puncture and analyzed to observe the change in cholesterol level in hypercholesterolemic rats.*

Results: *Results showed that only cholesterol fed group B gained body weight and other groups lost their body weight ($p<.005$). Regarding the lipid levels, it was observed that there was statistically significant rise of serum Total Cholesterol, Low Density Lipoprotein and Triglyceride levels in cholesterol fed group B compared to group A, C, D, E ($p<0.05$). The serum TC, LDL,TG level significantly decrease in both canola oil and atorvastatin along with cholesterol fed group C, D and E (<0.05) in comparison to only cholesterol fed group B but maximum effect was observed in atorvastatin fed group E,Serum HDL level significantly increase in canola oil and atorvastatin along with cholesterol fed group C, D and E ($p<0.05$) in comparison to only cholesterol fed group B.*

Conclusion: *This study showed canola oil and atorvastatin both lowers total cholesterol and increase the HDL cholesterol.*

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INTRODUCTION

Increased level of cholesterol is one of the major cause of atherosclerosis. The probable pathological ramifications of atherosclerosis contain myocardial infarction, cerebral infarction, aortic aneurism, peripheral vascular disease, mesenteric occlusion, sudden cardiac death, chronic ischaemic heart disease and ischaemic encephalopathy[1].

Low Density Lipoprotein (LDL) is one of the major risk factor for development of coronary artery disease as well as cardiac death. It is one of the major risk factor for the development of cardiac death. Blood LDL level and triglyceride (TG) level should be reduced to lower incidence of cardiac disease[2].

HDL is a cholesterol which has protective function against myocardial infarction and coronary artery disease[3]. Most of the heart diseases and stroke occur due to raised cholesterol. Increased cholesterol level is a major risk factor for ischemic heart disease and stroke in both developed and developing world. According to centers for disease control and prevention, prevalence of heart disease in United States, heart disease has been the leading cause of death in the United States[4].

Stroke is the third most common cause of death in United States[5]. Ischemic heart disease is the common cause of disability. The prevalence rate of ischemic heart failure is increasing day by day[6].

According to international journal of cardiology, the prevalence of coronary artery disease among Bangladeshi has greatly exceeded that of Caucasians[7]. In Europe non-communicable diseases such as cardiovascular disease, cancer, chronic obstructive pulmonary disease and diabetes causes 85% of death[8]. A 1% greater LDL value is associated with slightly more than a 2% increase in coronary artery disease; a 1% lower HDL value is associated with a 3 to 4% increase in coronary artery disease[9].

Atorvastatin is a cholesterol lowering agent which is called HMG COA reductase inhibitor[10]. It reduces LDL level, TG level, Total Cholesterol level, improves endothelial function, reduces peripheral resistance and decrease blood pressure[11,12].

Canola oil is a healthy oil. It contains very low amount of saturated fat and high amount of monounsaturated fat and omega 3 fatty acid. Canola oil lowers total cholesterol, LDL and triglyceride level. It also has effect on HDL levels. Canola oil contains monounsaturated and omega-3 fatty acids which help to reduce total body cholesterol. Canola oil reduces risk of myocardial infarction, arrhythmia and thrombosis. Canola oil contains eicosapentanoic acids and docosahexanoic acid and alpha linoleic acid which prevents cardiac disease and also reduce peripheral vascular disease.[13,14]

MATERIALS AND METHODS:

This experimental study was conducted in department of pharmacology and therapeutics, Dhaka Medical College, Dhaka (January 2018 to December 2018). Ethical approval from the ethical approval committee was obtained prior to the commencement of the study. Total 35 wistar rats were used for the study and divided into 5 groups (Group A, Group B, Group C, Group D, Group E).

Each group comprising of 7 rats. Group A received normal diet and distilled water. Group B received normal diet and cholesterol fed diet that was 10% cholesterol. Each rat received 1.5 ml olive oil with cholesterol. Group Creceived normal diet, 10% cholesterol and low dose canola oil (25ml/kg). Group D received normal diet, 10% cholesterol, and High dose canola oil (50ml/kg). Group E received normal diet, 10% cholesterol and Atorvastatin (1.3mg/kg). Each group was treated for 14 days and sacrificed on 15th day. Body weight was measured at the beginning day 0 and on 15th day of experiment. Blood was collected by cardiac puncture for estimation of lipid profile. At the day 0 of the experiment. We could not measure serum cholesterol level of each rat because we could not collect the blood. If we collected the blood the rats were died.

All data were registered, documented and in the statistical program Statistical Package for Social Science (SPSS) version 22. Continous data were expressed as mean ± Standard deviation (SD). After data analysis, study study was presented in the form of tables and diagram. Results between two groups done by unpaired t test and 3 groups or more than 3 groups by Anova test. values of probability p of <0.05 was considered to be statistically significant and 95% CI.

RESULTS

This result was carried out to determine the cholesterol lowering effect of canola oil in hypercholesterolemic rats in Dhaka medical college, during the period from January 2018 to December

2018. Thirty five rats were selected randomly. Appropriate statistical technic was used for data analysis. The findings are presented with table and diagrams. Figure 1 shows that the HDL level is lowest in Group B and highest in group E and from Group B to Group E gradually increases HDL Levels. Figure 2 shows that the TC level is highest in group B and lowest in group E. From group B to group E it decreases gradually. Figure 3 shows that the LDL level is highest in group B and lowest in Group E and from B to group E gradually decreases the LDL levels. Figure 4 shows that the TG level is highest in group B and lowest in Group E and from B to group E gradually decreases the TG levels.

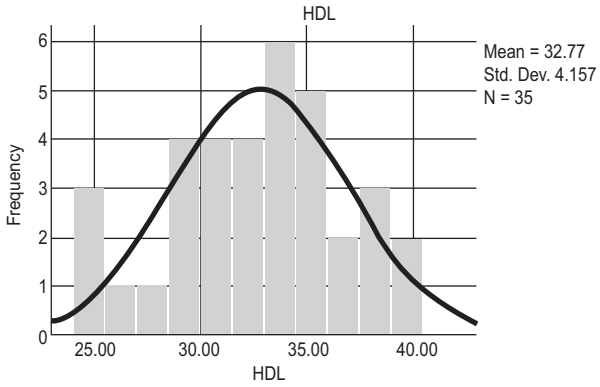

Fig.-1 : *Histogram showing high-density lipoprotein level in different Cholesterol fed groups of rats after 14 days of study.*

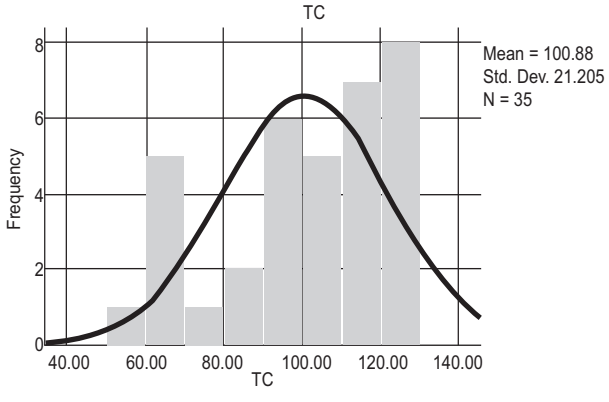

Fig.-2 : *Histogram showing serum total cholesterol level in different cholesterol fed groups of rats after 14 days of the study.*

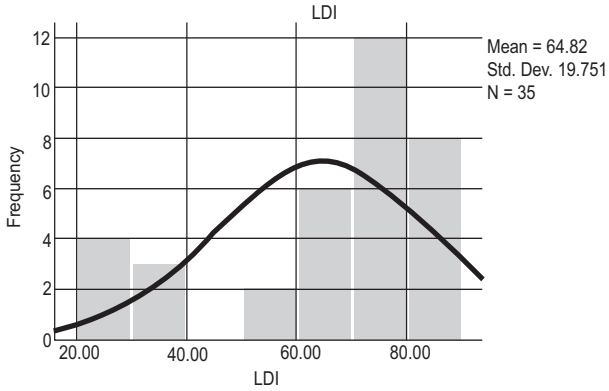

Fig.-3 : *Histogram showing serum low-density lipoprotein level in different Cholesterol fed groups of rats after 14 days of the study.*

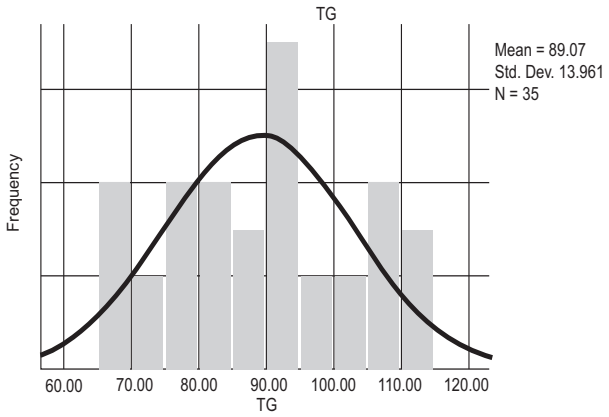

Fig.-4 : *Histogram showing serum triglyceride level in different Cholesterol fed groups of rats after 14 days of the study.*

Table I shows the change of body weight of rats of all groups. Group A, B, C, D and E from day 0 to day 15. The gain or loss in body weight during experimental procedure was calculated by subtracting the initial body weight (at the day of 0) from the final body weight (on the day of 15). The body weight was expressed in grams. In group A, mean ± SD, body weight is changes from 180.57 ± 1.72 to 181.14 ± 1.34 which is statistically not significant . The mean±SD initial and final body weight of group B rats is from 181.71±3.59 to 216.0±3.70 which is statistically significant.The mean initial and final body weights of group C is156±3.36 to 150.43±2.99 which is statistically significant. In group D the initial and final body weight is 159.57± 3.51 to 150.14±3.29 which is statistically significant . In group E initial and final body weight is 160.57±3.31 to 140.71±2.56 which is statistically significant.

Table-I: *Mean initial and final body weight of different groups of rats in the study*

Study Group's	Initial body weight (gm) (At day 0) (n=7) Mean±SD	Final weight (gm) (At day 15) (n=7) Mean±SD	Weight change (gm)	P value
Group A	180.57±1.72	181.14±1.34	WG 0.57	0.462^{ns}
Group B	181.71±3.59	216.0±3.70	WG 34.29	<0.001***
Group C	156.57±3.36	150.43±2.99	WL 6.14	<0.001***
Group D	159.57±3.51	150.14±3.29	WL 9.43	<0.001***
Group E	160.57±3.31	146.71±2.56	WL 13.86	<0.001***

WG= weight gain WL= weight loss

Table-II: *Comparison of Mean Lipid Profile of different groups of rats at the day of 15.*

Statistical analysis	p-valueTC	p-valueHDL	p-valueLDL	p-valueTG
Group A vs Group B	<0.001***	<0.001***	<0.001***	<0.001***
Group A vs Group C	0.002***	<0.001***	<0.001***	<0.001***
Group A vs Group D	<0.001***	<0.099 ^{ns}	<0.001***	<0.001***
Group A vs Group E	<0.001***	<0.001***	<0.001***	<0.001***
Group B vs Group C	<0.001***	<0.001***	<0.001***	<0.001***
Group B vs Group D	<0.001***	<0.001***	<0.001***	<0.001***
Group B vs Group E	<0.001***	<0.001***	<0.001***	<0.001***

Comparison done by students unpaired t test.

Table II shows that Group A which received normal diet vs Group B received cholesterol fed diet, P values of total cholesterol, LDL, HDL, TG, levels are statistically highly significant. Group A which received normal diet vs group C which received low dose canola oil, P values of TC, LDL, HDL, TG levels are statistically highly significant. Group A which received normal diet vs Group D which received high dose canola oil, p values of TC,LDL and TG levels are statistically highly significant except HDL which is statistically not significant. Group A which received normal diet vs Group E which received atorvastatin, p values of TC, LDL, HDL, TG levels are statistically highly significant.Group B which received cholesterol fed diet vs Group C which received low dose canola oil, p values of TC,HDL, LDL and TG levels are statistically highly significant. Group B which received cholesterol fed diet vs Group D which received high dose canola oil, p values of TC, LDL, HDL and TG levels are statistically highly significant. Group B which received cholesterol fed diet vs group E which received atorvastatin, p values of TC, HDL, LDL and TG levels are statistically highly significant.

DISCUSSION

The result showed that only cholesterol fed Group B rats gained body weight, and result was highly significant, (p is < 0.005).In comparison to other study by Marcia and Carlos, 1999 also showed that Cholesterol fed group gained their weight after the study and the result was significant. In this study cholesterol with canola oil fed group C and Group D loses their body weight, Cholesterol with atorvastatin fed group E was reduced. Here weight loss occur and all the results were highly significant. In comparison to other study by Aguila and Mandarium, 1999, also showed this type of result[14] ($p < 0.005$).

Regarding the lipid levels it was observed that mean lipid profile of different groups of rats after 14 days,

There was statically significant rise of serum TC, LDL and TG Levels occurs in cholesterol fed group B compared to that of group A, group C, group D, group E ($p<0.05$), the serum TC levels were significantly decrease in both canola oil and atorvastatin along with cholesterol fed group C, D and E ($p<0.05$) in comparison to only cholesterol fed group B but maximum effect was observed in atorvastatin group E. Serum LDL levels were significantly decreased in both canola oil and atorvastatin along with cholesterol fed group C, D and E($P<0.05$) in comparison to only cholesterol fed group B but maximum effect was observed in atorvastatin group E, serum HDL levels were significantly increased in canola oil fed group D and E and atorvastatin fed group E. Serum TG Levels were significantly decreased in both canola oil and atorvastatin along with cholesterol fed group C, D and E ($p<0.005$) in comparison to only cholesterol fed group B. This findings indicates that cholesterol fed diet is used to elevate the serum lipid profiles except HDL measured in this study. In comparison to another study by Striker et al, 2008 also showed that Canola oil decrease total cholesterol as well as LDL cholesterol and the result was significant[15].

Garg and Blake, 1997 showed that canola oil is rich monounsaturated and omega 3 fatty acids which lowers total body cholesterol. They said that sunflower oil which is rich in omega 6 fatty acids which also decrease total cholesterol but it deposited cholesterol in hepatic tissue which is harmful for body that canola oil not do[12].

In this study concomittant administration of canola oil, atorvastatin and hyperlipidemic diet daily orally for 14 days reduced serum TCL, LDL and TG levels. The reduction were highly significant in canola oil and atorvastatin diet and there were also significant increase in serum HDL levels.

CONCLUSION

The result and observation of the study provide ainformation for the use of canola oil in the development of new oil for consumption, much needed for the reduction of serum lipid levels (TC, TG, and LDL). Thus it could be useful in hyperlipidaemic condition, such as atherosclerosis, obesity, hypertension, hyperlipidaemia, IHD etc. As Canola oil is purely derived from natural source, so it might be a cost effective source to evaluate the cholesterol lowering property of Canola oil for advancement of the treatment of hypercholesterolemia in Humans.

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REFERENCES

1. Inedioha, I, J., Noel-uneke, O, A., Inedioha, T, E., 2011. Reference values for the serum lipid profile of albino rats of varied ages and sexes. Comp Clinical Pathology, 580 (11), pp1372-7'.
2. Goldenberg, J, I ., Benderly, M., Sidi, R., Boyko. V, Tenenbaum, A., Tanne, D., Behar, S., 2009. Relation of clinical benefit of raising high-density lipoprotein cholesterol in patients with coronary heart disease (from the Bezafibrate Infarction prevention Trial). American Journal of Cardiology, 1;103 (1), pp 41-5.
3. Li, J, Z., Chen, M, L., Wang, S., Dong, J, J., Zeng, P., Hou, L, W., 2004. Apparent protective effect of high density lipoprotein against coronary heart disease in the elderly. Chin Medical Journal (Engl), 117(4), pp 511-5
4. Kurt, J., Greenlund., Janet, B., Craft., George, A., Mensah., 2004. Prevalence of heart disease and stroke risk factors in persons with Prehypertension in United States. 164, pp 2113-2118.
5. Hsies, F., Hung, C., 2014. Stroke: morbidity, risk factor, and care in Taiwan. Journal of stroke, 16(2), pp 59-64.
6. Moran, A, E., Forouzanfar, M, H., Roth, G, A., Mensah, G, A., Ezzati, M, J., Flaxman, A., Murray, C, J., Naghavi, M., 2014. The global burden of ischaemic heart disease in 1990 and 2010: the Global Burden of Disease 2010 study. 129(14), pp1493-501.
7. Silbiger, J, J., Ashtiani, R., Attari, M., Spreill, T, M., Kamran, M., Reynolds, D., Stein, R., Rubinstein, D., 2011. Atherosclerotic heart disease in Bangladeshi immigrants: risk factors and angiographic findings. International journal of cardiology. 146(2), pp38-40.

8. Peracino, A., Paoletti, R., 2009. Health Policy Issues in Multiple Risk Factor Management in Cardiovascular Disease. 10(1), pp1-30.

9. Wilson, P, W., 1990. High density lipoprotein, low density lipoprotein and coronary artery disease. American Journal of Cardiology, 66(6), pp 7-10.

10. Wassmann, S., Laufs, U., Baumer, A, T., Muller, K., Ahlbory, K., Linz, W., Itter, G., Rogen, R., Bohm, M., Nickening, G., 2001. HMG-CoA Reductase Inhibitor Improve Endothelial Dysfunction in Normocholesterolemic Hypertension Via Reduced Production of Reactive Oxygen Species. 37, pp1450-1457.

11. Dupis, J ., Tardif, J, C., Cernacek, P., Theroux, P., 1999. Cholesterol reduction rapidly improves coronary syndromes. 99(25), pp3227-33.

12. Crespo, M, J., Quidgley, J., 2015. Simvastatin, atorvastatin, and pravastatin equally improve the hemodynamic status of diabetic rats. 6(10), pp-1168-1178.

13. Garg, M, L., Blake, R., 1997. Cholesterol Dynamic in rats fed diets containing canola oil or sunflower oil, Nutrition research, 17 (3), pp485-492.

14. Aguila, M, B., Mandarium, C, A., 1999. Numerical density of cardiac myocites in aged rats fed a cholesterol rich diet and a canola oil diet. 434, pp 451-453.

15. Strikem, H., Duchini, F., Facchini, M., Mombelli., Giorgio., 2008. Canola Oil decrease cholesterol and improves endothelial function in patients with peripheral arterial occlusive disease. 2,pp 67-73.

Review Article

A Review on Obesity in Asians: Recommended Cut-Off Value of BMI

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ABSTRACT

The Expert Consultation meeting of WHO held in 2002 recommended a new BMI cut-off value for being overweight and obese in the Asian population. We reviewed 23 articles & selected 10 articles by using search engine PubMed, Google Scholar and Google. There were 10 studies which have identified the BMI cut–off points for Asians populations lower than the international BMI cut- off points recommended by the National Health and Nutrition Examination Survey (NHANES) & the World Health Organization (WHO). Many of the studies have recommended lowering BMI cut-off point specific for Asian populations. Asian populations were also noted to have higher cardiovascular risk factors than Western populations at any BMI level. It is necessary to develop and redefine appropriate BMI cut-off points which are country-specific and ethnic-specific for Asians. More research would be needed to look at the all-cause mortality at same BMI levels between Asians and Caucasians in order to evaluate the BMI cut-off recommendations for Asian populations.

Keywords: *Obesity, BMI, cut-off value, Asians..*

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INTRODUCTION:

According to the World Health Organization (WHO), "Obesity" is defined as an excessive accumulation of fat within the body.[1] At present times, obesity is a major health challenge worldwide. The burden of obesity has become doubled in the last two decades particularly in Asian countries. WHO assumed that, non-communicable diseases (NCDs) due to obesity are the cause of 52% mortality, and are going to be 72% of total mortality by 2030 in Asia.[2-4] The National Health and Nutrition Examination Survey (NHANES) data showed that prevalence of obesity among Asian adults increased from 33.7% in 2007-2008 to 39.6% in 2015-2016.[5] Obesity poses serious health issues leading to several cardio-metabolic disorders such as hypertension, cardiovascular diseases (CVD), metabolic syndrome (MetS), type 2 Diabetes, dyslipidemia etc. Abdominal or central obesity is highly associated with the development of all these diseases and consequences of which ultimately reduce quality of life with life expectancy. The body mass index (BMI), calculated as weight in kilograms divided by height in meters squared (kg/m^2), is a widely used alternative way for assessing body fats. WHO recommended classifications of overweight and obesity with respect to risk of developing cardio-metabolic disorders mainly based on BMI.[7-10] BMI cut-off value set by WHO (to be used

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worldwide) was actually based upon the researches on population of Europe and America. It was in 2002 that WHO found out that a single BMI cut-off value is unacceptable for measuring risk factors of cardio-metabolic disorders among all ethnicities. They observed that for a "standard" cut-off value, the risk of several cardiovascular and metabolic diseases amongst Asian people increased as the Asians had a lower cut-off value than the others. Thus they decided to reduce this figure and brought it down to 23.0 kg/m^2 from 25.0 kg/m^2 for overweight and to 27.5 kg/m^2 from 30 kg/m^2 for obesity. The basis of this change was due to the fact that Asians are more likely to have a higher percentage of body fat at lower BMI than Europeans, which may lead to higher risk of cardiovascular and metabolic diseases.[2, 15-20]

However, it was observed that in reality the BMI cut-off for the Asians was even lower and this value further varied amongst people of different countries inside this continent.[4, 13,15] Therefore, we undertook a descriptive review of the studies that aimed to identify the optimal cut-off points of BMI developed for Asian population.

SEARCH STRATEGY

We performed an exploratory search from the relevant search engine as PubMed, Scopus, MedLine and Google Scholar. The search terms "Obesity," "BMI cutoff value" and "Asians" were combined with the name of many Asian countries like Bangladesh, India, China, Iran, Srilanka etc. Studies were searched by titles and/or abstracts. In addition, reference lists were also scrutinized to find relevant published articles.

The main inclusion criterion was English language full text articles published on or after the year 2000. Likewise, only population-based studies on apparently healthy subjects, aged ≥18 years, consisting of both genders and sample size of more than 100 were included. Studies on patients, targeted to particular occupational groups, conducted in hospital settings and among Asian immigrants were excluded.

This review examined a total of 10 studies comprising 14,515 males (44.1%) and 18,390 females (55.9 %). Two studies were conducted in Bangladesh [8,10] and one each in China, India, Indonesia, Iran, Japan, Korea, Thailand and Srilanka. Eight studies were carried out in urban settings[12–15,18,19,21,22], three in rural[24–26], four in both urban and rural[16,17,20,23], and one study did not mention setting.[27] Fifteen included studies that were cross-sectional and one was longitudinal. All the studies mentioned the study year, out of which two were in 2014, two in 2016 and two in 2017. Three studies had a participant range of 500 –1000, nine had between 500 and 2500 participants and four studies had more than 2500 participants. Thirteen studies selected study participants by randomized sampling method, whereas in two studies[21, 27], they were selected non-randomly. The response rate of the participants varied from 61.3 to 98.2%.

3. Defining obesity on BMI cut-off value:

Table I

Variables	Consensus guidelines for Asians	Prevalent International Criteria
Generalized obesity (BMI cut-offs in kg/m^2)	Normal : 18.0 - 22.9 Overweight : 23.0 - 24.9 Obesity : ≥25.0	Normal : 18.0 - 24.9 Overweight : 25.0 - 29.9 Obesity : ≥30.0

Table - II Findings of studies conducted on Asians

Study no.	Countries in Asia	1st author (y)	Study design	Study subjects	Findings on optimal BMI : based on cardiovascular and metabolic risk factors
1.	Bangladesh	Rahman et. al. 2017[10]	Nationwide survey	7433 individuals aged ≥35 yrs.	Hypertension and Diabetes Mellitus at BMI 23.0 - 24.9 kg/m^2
2.	India	Hunma et. al. 2016[5]		175 individuals aged between 20 -42 yrs.	Increased body fat percentage at BMI 21 - 22 kg/m^2 for the overweight and 26-27 kg/m^2 for the obese
3.	Iran	Babai et. al. 2016[15]	Cross-sectional study	12,283 individuals aged between 20 -65 yrs.	Metabolic Syndrome at an average BMI of 26.2 kg/m^2
4.	Korea	Kim et.al. 2013	Nationwide survey	12,217 individuals aged ≥20 yrs.	Increased body fat percentage, dyslipidemia and Insulin Resistance at BMI less than 23 kg/m^2
5.	Srilanka	Katulanda et. al. 2010[7]	Cross-sectional study	4474 individuals aged ≥18 yrs.	Hypertension, Dyslipidemia and Diabetes Mellitus at BMI 20.7 – 21.5 kg/m^2
6.	Indonesia	Hastuti et. al. 2017[14]	Cross-sectional study	600 individuals aged between 20 - 65 yrs.	Increased body fat percentage at BMI 21.9 – 23.6 kg/m^2
7.	Thailand	Temcharoen et. al. 2009[17]	Cross-sectional study	413 individuals aged between 35 – 50 yrs.	Hypertension and Dyslipidemia at BMI 23.0 – 24.0 kg/m^2
8.	China	Zeng et. al. 2014[13]	Large population-based cross-sectional study	2,21,270 individuals aged ≥20 yrs.	Hypertension at BMI 23.0 – 24.0 kg/m^2
9.	Japan	Heianza et. al. 2014[22]	Cross-sectional study	29,564 individuals between 18 - 90 yrs.	Hypertension, Dyslipidemia and Impaired fasting glucose at BMI < 25.0 kg/m^2
10.	Bangladesh	Siddiquee et. al. 2015[5]	Cross-sectional survey	2293 rural individuals aged ≥20 yrs.	Overweight at BMI 23.0 – 25.0 kg/m^2 and Obese at BMI ≥25.0 kg/m^2

DISCUSSION:

Our overview has shown that Asian people had greater cardiovascular risk factors than Western population at a lower BMI level.

Our first study showed that about 12% of Bangladeshi adults, both male and female, were within the BMI range of 23·0–24·9 kg/m^2 or moderately overweight. Compared with the reference BMI group (18·5–22·9 kg/m^2), they had an increased prevalence ratios for HTN (1·55–1·77) and T2DM (1·54–1·93). These increased prevalence ratios are similar to those for the WHO-defined overweight group (BMI =25·0–29·9 kg/m^2).[10]

Our second study showed that compared to body fat percentage predicted from BMI using Caucasian-

based equations, body fat percentage assessed by D_2O dilution was higher by 3–5 units in Indian men and women. Overall, WHO BMI cut-offs of 25 kg/m^2 and 30 kg/m^2 for overweight and obesity respectively, does not seem valid for Indian men and women whose BMI cut-offs are 3 – 4 units lower (21–22 kg/m^2 for the overweight and 26–27 kg/m^2 for the obese).[5]

Our third study showed that the optimum BMI cut-off point for predicting metabolic syndrome was 26.1 kg/m^2 and 26.2 kg/m^2 for Iranian males and females respectively. The overall BMI cut-off for both sexes was 26.2 kg/m.[2] The optimum BMI cut-off for acquiring metabolic risk factors in males decreased to 25.7 kg/m^2 and increased for women to 27.05 kg/m^2.[15]

Our fourth study showed that despite having a normal BMI (18.5 – 22.9 kg/m^2), the prevalence of "normal weight obesity" (body fat percentage in the overweight or obesity range) was considerably higher in the general Korean population.

Our fifth study showed that the common cut-off value of BMI for Srilankan adult males and females was 21.5 kg/m^2. [7]

Our sixth study proposed the new cut-off for BMI in Indonesian adults for determination of obesity to be 21.9 (kg/m^2) for males and 23.6 (kg/m^2) for females respectively.[14]

Our seventh study showed the prevalence of overweight in adult Thai subjects was 57.8 percent by the BMI > 23 kg/m^2, i.e. the Asian cut-off point criteria, while it was only 32.7 percent by the BMI > 25 kg/m^2, i.e. the WHO criteria. The cut-off points of BMI which corresponded with the at-risk level of SBP, DBP, TC, TG, LDL-C, and HDL-C were 23.5, 23.5, 22.5, 23.5, 23.0 and 24.0 kg/m^2, respectively. BMI at 23.5 kg/m^2 was suggested as the optimal cut-off point of BMI which reflects the risk-level of CVD risk factors.[17]

Our eighth study showed the optimal cut-off values were approximately 24·0 and 23·0 kg/m^2 for BMI in Chinese adult men and women, respectively. According to well-established cut-off values, this BMI was found to be a more sensitive indicator of hypertension in both adult Chinese men and women.[13]

Our ninth study showed the prevalence of hypertension, dyslipidemia and impaired fasting glucose at BMI < 25.0 kg/m^2 for Japanese adults.[22]

Our tenth study found the cut-off value of BMI in Bangladeshi adults for overweight to be 23.0 – 25.0 kg/m^2 and for obese to be e" 25.0 kg/m^2.[5]

CONCLUSION:

Asians had higher cardiovascular risk factors than Western populations at a lower BMI level. Further research would be needed to look at the causes of mortality and morbidities at the same BMI levels between Asians and other ethnicities in order to evaluate the BMI cut-off recommendations for Asians. It will be even better to redefine appropriate BMI cut-off points which are country-specific for Asians. This will definitely facilitate the development of appropriate preventive measures to address the public health problems arising due to obesity.

REFERENCES

1. Materko W, Santos EL. Optimal cut-off values for obesity using classification tree in middle aged adults living Rio de Janeiro city. International Journal of Research in Medical Sciences. 2017 Jun 24; 5(7):3172-7. DOI: http://dx.doi.org/10.18203/23206012.ijrms20173008.
2. Low S, Chin MC, Ma S, Heng D, Deurenberg-Yap M. Rationale for redefining obesity in Asians. Annals Academy of Medicine Singapore. 2009 Jan 1; 38(1):66. PMID: 19221673
3. Misra A, Shrivastava U. Obesity and dyslipidemia in South Asians. Nutrients. 2013 Jul 16;5(7):2708-33. PMID: 23863826, DOI: 10.3390/nu5072708.
4. Chhezom K, Arslan MI, Hoque MM, Biswas SK. Biomarkers of cardiovascular and metabolic diseases in otherwise healthy overweight subjects in Bangladesh. Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 2017 Nov 1; 11:S381-4. PMID: 28285989, DOI: 10.1016/j.dsx.2017. 03.021.
5. Hunma S, Ramuth H, Miles-Chan JL, Schutz Y, Montani JP, Joonas N, Dulloo AG. Body composition-derived BMI cut-offs for overweight and obesity in Indians and Creoles of Mauritius: comparison with Caucasians. International Journal of Obesity. 2016 Dec; 40(12):1906.
6. Hales CM, Fryar CD, Carroll MD, Freedman DS, Ogden CL. Trends in Obesity and Severe Obesity Prevalence in US Youth and Adults by Sex and Age, 2007-2008 to 2015-2016. JAMA. 2018 Apr 24; 319(16):1723-5. doi:10.1001/jama.2018.3060.
7. Biswas T, Garnett SP, Pervin S, Rawal LB. The prevalence of underweight, overweight and obesity

in Bangladeshi adults: Data from a national survey. PloS one. 2017 May 16; 12(5):e0177395. PMID: 28510585, https://doi.org/10.1371/journal.pone.0177395.

8. Siddiquee T, Bhowmik B, Moreira NC, Mujumder A, Mahtab H, Khan AA, Hussain A. Prevalence of obesity in a rural Asian Indian (Bangladeshi) population and its determinants. BMC public health. 2015 Dec; 15(1):860. PMID: 26341552. DOI: 10.1186/s12889-015-2193-4.

9. Katulanda P, Jayawardena MA, Sheriff MH, Matthews DR. Derivation of anthropometric cut-off levels to define CVD risk in Sri Lankan adults. British journal of nutrition. 2011 Apr; 105(7):1084-90.

10. Rahman M, Williams G, Al Mamun A. Hypertension and diabetes prevalence among adults with moderately increased BMI (23· 0–24· 9 kg/m 2): findings from a nationwide survey in Bangladesh. Public health nutrition. 2017 Jun; 20(8):1343-50. DOI: 10.1017/S1368980016003566.

11. de Wilde JA, van Dommelen P, Middelkoop BJ. Appropriate body mass index cut-offs to determine thinness, overweight and obesity in South Asian children in the Netherlands. PLoS One. 2013 Dec 19; 8(12):e82822.

12. Pasco JA, Holloway KL, Dobbins AG, Kotowicz MA, Williams LJ, Brennan SL. Body mass index and measures of body fat for defining obesity and underweight: a cross-sectional, population based study. BMC obesity. 2014 Dec; 1(1):9.

13. Zeng Q, He Y, Dong S, Zhao X, Chen Z, Song Z, Chang G, Yang F, Wang Y. Optimal cut-off values of BMI, waist circumference and waist: height ratio for defining obesity in Chinese adults. British Journal of Nutrition. 2014 Nov; 112(10):1735-44.

14. Hastuti J, Kagawa M, Byrne NM, Hills AP. Determination of new anthropometric cut-off values for obesity screening in Indonesian adults. Asia Pacific journal of clinical nutrition. 2017; 26(4):650.

15. Babai MA, Arasteh P, Hadibarhaghtalab M, Naghizadeh MM, Salehi A, Askari A, Homayounfar R. Defining a BMI cut-off point for the Iranian population: the Shiraz Heart Study. PLOS one. 2016 Aug 10; 11(8):e0160639.

16. WHO EC. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet (London, England). 2004 Jan 10; 363(9403):157. PMID: 14726171 DOI: 10.1016/S01406736(03)15268-3.

17. Temcharoen P, Temcharoen P, Kaewboonruang P, Pradipasen M, Pradipasen M, Srisorachart S, Srisorachart S. The optimal cut-off points of body mass index which reflect the risk factors of cardiovascular disease in the urban Thai male population. J Med Assoc Thai. 2009 Dec; 92 Suppl 7:S68-74. PMID: 20235359.

18. Jih J, Mukherjea A, Vittinghoff E, Nguyen TT, Tsoh JY, Fukuoka Y, Bender MS, Tseng W, Kanaya AM. Using appropriate body mass index cut points for overweight and obesity among Asian Americans. Preventive medicine. 2014 Aug 1; 65:1-6. PMID: 24736092. doi:10.1016/j.ypmed.2014.04.010.

19. Deurenberg Yap M, Chew SK, Deurenberg P. Elevated body fat percentage and cardiovascular risks at low body mass index levels among Singaporean Chinese, Malays and Indians. Obesity Reviews. 2002 Aug; 3(3):209-15.

20. Dudeja V, Misra A, Pandey RM, Devina G, Kumar G, Vikram NK. BMI does not accurately predict overweight in Asian Indians in northern India. British Journal of Nutrition. 2001 Jul;86(1):105-12.

21. Buderer NM. Statistical methodology: Incorporating the prevalence of disease into the sample size calculation for sensitivity and specificity. Academic Emergency Medicine. 1996 Sep; 3(9):895-900.

22. Kim MK, Han K, Kwon HS, Song KH, Yim HW, Lee WC, Park YM. Normal weight obesity in K orean adults. Clinical endocrinology. 2014 Feb; 80(2): 214-20.

23. Heianza Y, Kato K, Kodama S, Ohara N,Suzuki A, Tanaka S, Hanyu O, Sato K, Sone H. Risk of the development of Type 2 diabetes in relation to overall obesity, abdominal obesity and the clustering of metabolic abnormalities in Japanese individuals: does metabolically healthy overweight really exist? The Niigata Wellness Study. Diabet.Med.2015 May; 32:665-672.

24. Blüher M. Obesity: global epidemiology and pathogenesis. Nature Reviews Endocrinology. 2019 Feb 27:1.

Case Report

38 Weeks Pregnancy with Fetal Distress with Dengue Haemorragic Fever: A case Report

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ABSTRACT:

Dengue is an arthropod borne viral infection endemic in tropical and subtropical countries. Severe dengue is life threatening. Pregnant women are 3.4 times more prone to develop severe dengue. A 32 year old lady presented with Dengue hemmorrhagic fever in her 38 weeks of pregnancy with fetal distress. The awareness and timely recognition of this complication is very important for proper management.

Keywords: *38 weeks pregnancy, Fetal distress, Dengue hemorrhagic fever, Severe dengue.*

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INTRODUCTION:

World health organization (WHO) currently estimates there may be 50 - 100 million dengue infections worldwide every year with over 2.5 billion people at risk of dengue[1]. Severe dengue (dengue hemorrhagic fever-DHF and dengue shock syndrome-DSS) is a potentially deadly complication due to plasma leaking, fluid accumulation, respiratory distress, severe bleeding, or organ impairment. The increase spread of disease has led to occurrence of more atypical presentations which may be potentially serious and result in increased morbidity and mortality[2].

CASE REPORT:

A 32 year old normotensive, non-diabetic, 38 weeks pregnant woman admitted in 500 beded Mugda general hospital on 06/07/2019 in medicine department and on 07/07/2019 she was transferred to Obs&Gynae department presented with high grade continued fever associated with headache and generalized bodyache for 4 days. She gave no H/O skin rash or bleeding from any site. She was on regular antenatal check up. Her pregnancy period was uneventful. She noticed less fetal movements for last 1 day. She gave no H/O bowel/bladder abnormality. There was no H/O joint pain, no H/O miscarriage. On general examination reveals temperature was found raised (100^{o} F), mild anaemia with other vital signs were within normal limits. Abdominal examination revealed that there was a single fetus with Breech presentation. Liquor volume seemed to be inadequate, fetal movement was sluggish and fetal size was average. Patient was not in labor. On the 3rd day of fever laboratory investigation showed dengue NS1 antigen was positive. Hb – 8.4 gm/dl, white blood cell-5.80K/ul, neutrophil-77%, lymphocyte-20%, monocyte-02%, eosinophil-01%. Total platelet count-225K/ul, HCT-26.2%, ESR-38 mm in 1st hour. USG of pregnancy profile had shown- About 36 weeks 3 days of single live pregnancy, Breech presentation, placenta-anterior, AFI-7.0 cm (Oligohydramnios). A provisional diagnosis was made as 2nd gravida with fetal distress with Dengue fever. Pregnancy was terminated by LSCS on 08/07/2019 due to fetal distress and Dengue fever was treated conservatively according to the national guideline[3].

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On the 5th day fever subsided and CBC reports showed- platelet count-124K/ul, HCT- 27.8%, Hb-8.9gm/dl, ALT- 53U/L, AST- 43U/L. 1 unit of fresh whole blood was given per operatively and On the day of LSCS operation, CBC showed – platelet count-82K/ul, HCT- 29.6%, white blood cell-7.0K/ul, Hb-9.1gm/dl. Operation findings was - Liquor was meconium stained, less in amount, baby was delivered by breech extraction per abdominally and a drain tube was kept in situ. A 2.5 KG of male baby was delivered, Apgar score was 6/10 in 1st and 10/10 in 5th minutes.

On day 8th of fever and on 2nd post operative day patient abdomen became distended, drain tube collection was about 1 litre which was blood mixed fluid. Patient developed haemoperitoneum and hypovolaemic shock. Therefore the patient was shifted to intensive care unit. She was put under close observation. Her CBC reports showed platelet count was-32000/cumm, Hb- 3.5 gm/dl, S. lipase- 65U/L, FDP- 12.992µg/ml, Fibrinogen level-219 mg/dl, APTT- 37.2 sec(control-30 sec), prothrombin time-11.5 sec(control-11.0 sec, INR-1.10), S. ALT- 46U/L, S.AST- 97U/L, S. Creatinine-0.7 mg/dl, white blood cell- 16500/cumm, Red blood cee – 1.47 millions/cumm, neutrophil-78%, HCT-10.8%. USG of whole abdomen revealed no ascites or pleural effusion.

On 3rd post operative day, Hb- 5.2 gm/dl, Total white blood cell count- 17000/cumm, red blood cell count-1.92 millions/cumm, platelet count- 218x10^3/µl, HCT- 15.5%, D-dimer- 5.72 µg/ml (ref-<0.5µg/ml). USG of whole abdomen showed – Subcutaneous incisional hematoma, bilateral pleural effusion, mild ascites and mild pelvic collection. Pulse was-80beats/min, blood pressure- 120/80 mmHg, drain tube collection was – 30 ml, urine output- 250 ml and per vaginal bleeding was nil.

After transfusing several units of fresh whole blood gradually features of shock were improved. Haemoglobin concentration gradually raised to 12.6 gm/dl. Drain tube collection reduced in amount. Intravenous albumin was given. There developed subcutaneous hematoma which was explored and secondary suture was given on 23/07/2019. Again wound dehiscence occurred and tertiary suture was given on 09/08/2019. After that she was discharged on 11/08/2019 and asked to come for follow up after 7 days. Her stich were removed on 18/08/2019. Wound was healthy and she was in good health as well as her baby.

DISCUSSION:

Dengue is an *Aedes aegypti* mosquito-borne infection, caused by dengue virus serotypes1, 2, 3and 4. It is a major public health problem in tropical countries[4]. There are few reports of DF and DHF in pregnancy from literature review. Now a days, the incidence has been increasing among adults[5,6], more cases of DF and DHF in pregnancy like this present case can be found.

These presentations might be confused with other obstetrics complications, such as HELLP syndrome (hemolysis, elevated liver enzyme and low platelet counts) and other medical disease. A high index of suspicion is therefore required for the diagnosis, especially in areas of endemicity.

Several studies have suggested that Dengue infection can predisposefull-term pregnant women to postpartum hemorrhage, evenmassive bleeding. Chotigeat*et al.* reported one case of a patient

suffering from Dengue shock syndrome (DSS) which later developedpostpartum hemorrhage

Our patient had come with pregnancy related complication associated with Dengue hemorrhagic fever. However after LSCS the patient developed dengue shock syndromeand was transferred to intensive therapy unit where she was treated meticulously. *Nadya Adi Kusuma* and *Anak Agung Ngurah Jaya Kusuma* stated the same type of management for this type of complicated cases[7]. *T.V. Chitra* & *Seetha Panicker* had also matched with our management[8].

CONCLUSION:

Dengue fever in pregnancy most often is treated conservatively. Platelet count may fall rapidly but no activeintervention required unless patient is in labour or has bleeding disorder.

Severe thrombocytopenia requires prompt resuscitation with blood and blood products prior to and during delivery, and is a key point in successful outcome of individuals.

REFERENCES:

1. Senanayake S. Dengue fever and dengue hemorrhagic fever: a diagnostic challenge. AustFam Physician. 2006;35:609-12.
2. Chen TC, Lu PL, Chen YH, Tsai JJ, Chen TP. Dengue hemorrhagic fever complicated with acute idiopathic scrotal edema and polyneuropathy. Am J Trop Med Hyg. 2008;78:8-10.
3. World Health Organization: Denguehemorrhagic fever: diagnosis, treatment and control. *Geneva, World Health Organization*1986
4. Carles G, Peiffer H, Talarmin A: Effects of dengue fever during pregnancy in French Guiana. *ClinInfect Dis* 1999;28:637-640
5. GohKT:Dengue–are-emerging infectious disease in Singa- pore. *Ann Acad Med Singapore* 1997,26:664-670.
6. Thaithumyanon P, Thisyakorn U, Deerojnawong J, Innis BL: Dengue infection complicated by severe hemorrhage and vertical transmission in a parturient woman. *Clin In fect Dis* 1994,18:248-249
7. Kusuma, N.A., Kusuma, A.A.N.J. 2017. Dengue hemorrhagic fever in pregnancy with placenta abruption and vertical transmission: a case report. *Bali Medical Journal* 3(3): S100-S104. DOI:10.15562/bmj.v3i3.681
8. T.V. Chitra & Seetha Panicker 2011: Maternal and fetal outcome of dengue fever in pregnancy: *J Vector Borne Dis* 48, December 2011, pp. 210–213.