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Contents

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The North Bengal Medical College Journal (NBMC J) is a peer-reviewed journal published biannually. It is the official organ of North Bengal Medical College, Sirajganj, Bangladesh.

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From the Desk of the Editor-in-Chief

Congratulations !!

All praises to the Almighty. It is a great pleasure that North Bengal Medical College is the first private medical college in the Northern part of Bangladesh, going to publish its first scientific journal. It is undoubtedly a tremendous task to publish a journal but our devoted researchers and doctors contribute themselves to achieve this effort possible.

The aim of this journal is to enhance and upgrade the research work in the field of medical science. It provides an integrative forum for medical researchers across the globe to exchange their knowledge and views. It also helps to promote communication among fellow academicians and researchers worldwide. It provides an opportunity to academicians in exchanging their knowledge that is directly relevant to all domains of health sciences.

I would like to congratulate the journal committee and all concerned personnel for the publication of this first issue. I hope this journal will develop a new channel for authors for disseminating their research findings. Honorable medical researchers are invited to submit their research paper for the next issues.

Lastly, I express my heartfelt gratitude to all the researchers for their cordial endeavour. I expect regular publication of the biannual issues of this journal would brighten the academic and research environment of this institution. I am very much hopeful for the better outcome of this journal.

Professor Dr. S. M. Akram Hossain
Editor-in-Chief

Editorial

Extracorporeal Shockwave for Myocardial Revascularization (ESMR)

The ESMR therapy is a non-invasive therapy approach using Extracorporeal Shockwave technology for Myocardial Revascularization. Ischaemic myocardial areas no longer accessible by conventional revascularization therapies could be treated with the Cardiospec ESMR therapy to relieve symptoms resulted from the myocardial ischaemia. The treatment is performed using a shock wave generator that is designed to address the unique clinical-anatomical requirements of the chest cavity. Meta-analysis of Extracorporeal Shockwave Myocardial Revascularization (ESMR) trials presented between 2006 and 2012 where 494 patients in 17 medical centers across Europe and Asia were treated.[1]

ESMR uses shock waves. Shockwaves are special acoustics waves that can be targetted and focused non-invasively to a selected area inside the patient's body. Shock wave therapies have been used in the last decades in Nephrology (kidney stone lithotripsy), Orthopaedics (plantar facilities) and Urology (erectile dysfunction) applications. In-vitro and animal data indicated an increase of angiogenic factor production and signs of neo-vascularization following treatment with low intensity shock waves (10% of the energy used for lithotripsy). This is the basis for feasibility testing in regional myocardial ischaemia.[2]

At each treatment session, shock waves should be delivered to the border of the ischaemic area for triggering angiogenesis etc. within the viable tissue with a scheme of 3 sessions per week, up to 10 spots per session and 100 shocks per spot. Patients having viable myocardial segments with reversible ischaemia and/or hibernation, optimum medical therapy (last 6 weeks), absence of acute clinical events (for >1 months) and patients who are unsuitable for invasive revascularization are the probable candidates for ESMR. Those with active coronary inflammatory process, acute Myocardial Infarction (MI) <3 months prior to treatment, intra-ventricular thrombus, pregnancy, malignancy in the area of treatment and inability of adequate echocardiography window are not eligible for ESMR. Prior to ESMR ECG, echocardiography and cardiac SPECT for

detection of area of myocardial injuries are undertaken.[3-4]

The data from the current meta-analysis demonstrate that Extracorporeal Shockwave Myocardial Revascularization (ESMR) improved symptoms, delayed the ischemic threshold and increased exercise tolerance. No side effects were reported and no ESMR-related myocardial damage was observed.[1,2] It can be told that ESMR is a non-invasive therapy that is safe and appears to be efficacious in the treatment of Refractory Angina Pectoris. Extracorporeal Shockwave Myocardial Revascularization (ESMR) may therefore be regarded as an effective noninvasive method of treatment for myocardial ischemia in end-stage CAD patients.

Professor Dr. M. A. Muqueet
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Instructions for Authors

Authors are invited for submission of articles in all fields of medical science and all correspondence should be addressed to -

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Overall general Instructions

- Type manuscripts in British English in double-spaced paragraph including references, figures with legends and tables on one side of the page.
- Leave 2.5 centimeter margin on all sides with number in every page at the bottom of the page (middle) beginning with the abstract page and including text, tables, references and figures
- Cite each reference in text in numerical order with their lists in the reference section (As Vancouver Style).
- SI units of measurement should be used.
- Assemble manuscript in following order

(1) Title page
(2) Then next page with author designations and place of work.
(3) Abstract (structured) within 250 words.
(4) Main text which includes Introduction, Materials and methods, Results, Discussion, Conclusion, Acknowledgments (if any) and contributions of the authors in that specific study.
(5) References
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- Articles should not exceed over 10,000 words**.** Over–length manuscripts will not be accepted for publication.
- Submit two copies of the manuscripts with electronic version (MS word) which is needed to be submitted in a compact disc.

First title page with author information (1st page should not be numbered)

Text page must include:

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- **Abstract page (First numbered page)**
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- Limit use of acronyms and abbreviations. Abbreviations must be defined at the first mention.
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The Text

The Following are typical main headings:

i. **Introduction**
ii. **Materials and Methods**
iii. **Results**
iv. **Discussion and Conclusion.**

Introduction:

Summarize the rationale for the study with pertinent references. The purpose (s) of the study should be clearly elicited.

Materials and Methods:

Identify type of study and describe the study subjects and methods used with methods of statistical analysis. Cite reference (s) for standard study and statistical methods. Describe new or modified methods. Give proper description of the apparatus (with name and address of manufacturer) used. ***Generic name of drug must be given. Manuscripts that describe studies on humans must indicate that the study was approved by an institutional Ethical Committee and that the subjects gave informed consent.***

Results:

Present only important results observations in logical sequence in the text, tables or illustrations with relevant statistics.

Discussion:

Emphasize new and important results and the conclusions that follow including

implications and limitations Relate observations to other relevant studies.

Conclusion:

Include brief findings and authors suggestions on basis of findings of study.

Acknowledgments:

List all sources of funding for the research with contributions of individuals.

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1. World Health Organization: WHO Recommendations: Low Birth Weight: preventing and managing the Global Epidemic. Geneva, World Health Org, 2000 (Tech.Rep.Ser., no.894).
2. Rashid M. Food and Nutrition. In Rashid KM, Rahman M, Hyder S eds. Textbook of community Medicine and Public Health.4th edn. RHM Publishers: Dhaka. 2004; pp. 156-160.
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6. Hussain MN, Kamaruddin M. Nipah virus attack in South East Asia: challenges for Bangladesh. Prime Med Coll J. 2011; I (1): i-ii [Editorial].

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Each Table must be typed on a separate page. The table number should be followed by a Roman brief informative title. Provide explanatory matter in footnotes. For footnotes use symbol in this sequence; *, **, +, ++, etc.

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North Bengal Medical College Journal
Vol 1 No 1 July 2015

Original Article

Proteinuria Among the Patients with Diabetes Mellitus

Md. Shariful Haque[1], ARM Saifuddin Ekram[2], AKM Enamul Haque[3]

Revised: October 28, 2013 Accepted: January 12, 2014

Abstract

Introduction: *Diabetic nephropathy is one of the commonest microvascular diabetic complications. Nephropathy causes proteinuria in diabetic subjects.*

Methods: *This present cross-sectional study was carried out to observe proteinuria among the patients of diabetes mellitus at medicine wards of Rajshahi Medical College Hospital, Rajshahi during the period of two years enrolling 60 diabetic subjects who were selected by nonrandom purposive sampling.*

Results: *In this study mean age of female was 52.35 and of male was 53.33 years. Among sixty diabetic patients 34(56.67%) patients had significant proteinuria or microalbuminuria. Under 5 years durations there were 4 (6.67%) within 5-10 years 12 (20%) and above 10 years 18 (30%) cases were found to have significant proteinuria. Protein levels in urine were in the range of ≥500mg/24hrs-2.5gm/24hrs, in 25 (73.53%) patients, over 2.5gm/24 hrs in 6(17.65%).Only 3 (8.82%) cases had proteinuria ranging from 300mg/dl to 500 mg/24 hrs. Most of the eye complication developed in those with diabetes duration over 10 years, i.e.20 (33.33%) cases followed by 20% within 5-10 years.*

Conclusion: *Diabetes mellitus has relation with development of nephropathy with the duration of disease. So, physician should pay attention with the subjects with diabetes mellitus for long time during treatment.*

Key words: *Proteinuria, Diabetes mellitus.*

NBMC J 2015; 1 (1): 6-10

Introduction

In most Western countries, diabetic nephropathy (DN) has become the leading cause of End Stage Renal Disease (ESRD).[1] According to the United States Renal Data System (USRDS 2001), in 1999 DN was the primary diagnosis in 42.8 per cent (38,160 of 89,252) of incident patients (USRDS 2001), an increase by 23.8 per cent compared to 1990.[2]

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Nephropathy, characterized by proteinuria and a decreasing glomerular filtration rate, develops in about 35 percent of patients with insulin-dependent diabetes mellitus[3]. Renal disease in diabetes is predictably progressive in that the glomerular filtration declines linearly, at a rate of about 1 ml per minute per month. Thus, most patients reach end-stage renal failure within 10 years after the onset of proteinuria. The problem is so extensive that one third of new dialysis patients in the United States have diabetic nephropathy.[4] The creatinine clearance was found to be significantly different between without nephropathy and with nephropathy group and had associated with proteinuria. Once even microalbuminuria is present, creatinine clearance declines at the rate that widely vary from patients to patients, the average reduction is 10-12 ml/min/yr.[4]

Materials and methods

This hospital based cross-sectional study was carried out among the patients of diabetes mellitus at medicine wards of Rajshahi Medical College Hospital, Rajshahi during the period of June 2006 to February 2008.Total 60 diabetic cases were selected by purposive sampling. Detailed history was taken regarding duration and treatment of diabetes, co-morbid conditions, family history of diabetes, intercurrent illness. During hospitalized period all appropriate investigations were done. Thorough examination was carried out to find diabetic retinopathy, postural hypotension, neuropathy, peripheral pulses and related complications, i.e. infection, ulcer. Urine for microalbumin was done when routine urine examination is negative for albumin. History and physical examination, including relevant investigations of patients with hypertension were recorded on a predesigned proforma. Protein excretion rate of ≥300mg/24 hrs was considered having proteinuria. Patients were categorized based on duration as group A (diabetes duration <5 yrs), Group B (diabetes duration 5-10 yrs) and Group C (diabetes duration >10 yrs). Patients diagnosed as diabetic were included in the study irrespective of duration of diabetes or age of the patient. Those with RBS/Bl sugar 2ABF/PPBS ≥ 11.1 mmol/L or ≥200 mg/dl, FBS ≥7 mmol/L or ≥ 126 mg/dl and subjects on oral anti diabetic drug and / or on insulin were included. Subjects with co-morbid conditions that might cause significant proteinuria or confound the study independent of diabetes were excluded, i.e. high fever, severe hypertension, heart failure, pregnancy and UTI.

Results

In present study, age range of the patients was 25-75 years. Mean age of female was 52.35 and of male was 53.33 years. Here 7 (11.67%) patients were below 40 years of age. And 13 (21.67%) were in age group 40 – 49 years, 20 (33.33%) were in age group 50 – 59 years, 15 (25%) were in age group 60–69 years and only 5 (8.33%) patients were in age group more than 70 years (Figure I).

Out of sixty diabetic patients, 20 (33.33%) were female and 40 (66.67%) were male.

Among sixty diabetic patients, 34 (56.67%) had significant proteinuria or microalbuminuria of which 23 (38.34%)

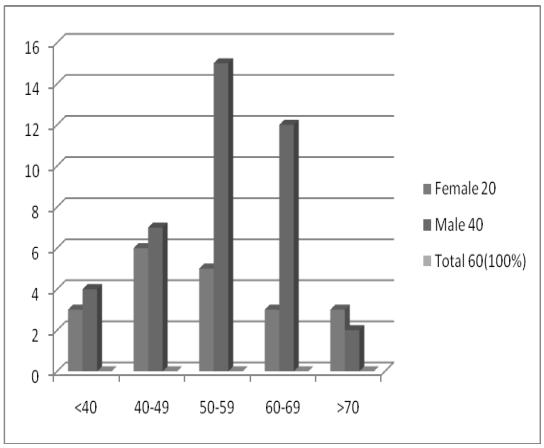

Figure 1: Bar diagram showing age distribution of the study subjects.

were males and 11 (18.33%) were females.(Table I). Under 5 years durations, there were 4 (6.67%), within 5-10 years duration 12 (20%) and above 10 years duration 18 (30%) were found to have significant proteinuria.

Table I: Duration of diabetes (in year) among the proteinuric patients

Gender	Number of patients with duration of diabetes				
	<5yrs	5-10 yrs	> 70yrs	Total	
M	3	8	12	23	
F	1	4	6	11	
	4	12	18	34	18(30%)

Among the persons having proteinuria (≥300mg/24 hrs), majority were in the range of 60-69 years.i.e.12 cases (20%), followed by 9 cases (15%) in the range of 50-59 years age group. The least among over 70 years, only one case (1.67%) (Figure 2).

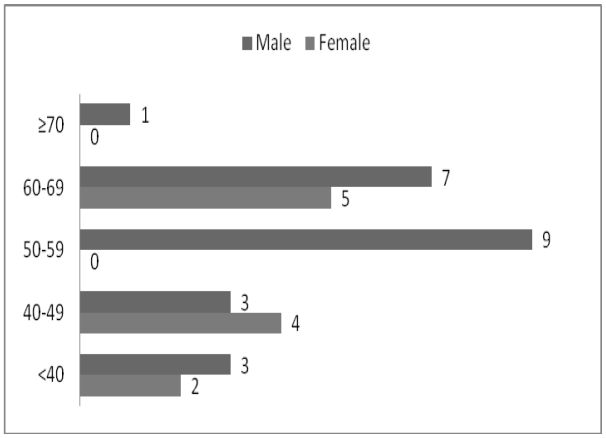

Figure 2: Gender distribution of patients in different age groups with proteinuria.

Protein levels were in the range of ≥500mg/24hrs-2.5gm/24hrs, in 25 patients

(73.53%), over 2.5gm/24 hrs in 6(17.65%). Only 3 cases (8.82%) were from 300mg/dl to 500 mg/dl in 24 hrs. (Table II)

Table II: Level of proteinuria in study subjects

≥300mg/24hrs-500mg/24hrs.	≥501mg/24hrs-2.5gm/24hrs	≥2.51gm/24hrs
3(8.82%)	25(73.53%)	6(17.65%)

Twenty nine patients (48.33%) had retinopathy. Eight cases (13.33%) had proliferative retinopathy and twenty one (35%) had non-proliferative retinopathy. Of the retinopathy cases, 19 (65.5%) were male and 10 (34.5%) were female. Under 5 year's duration of diabetes there were five cases, within 5-10 years, twelve cases and above 10 years twenty cases having eye complications. 27 (45%) cases had neuropathy, of which 19 (31.67%) were male and 8 (13.33%) were female. 7 cases (11.66%) had cataract; 3 patients (5%) had diabetic foot. One case (1.6%) had glaucoma and 1 (1.6%) case had cellulitis. Among neuropathic patients 19 (31.67%) were male and 8(13.33%) were female. 19 cases had combined retinopathy and neuropathy comprising 31.67%. Most of the eye complication developed in those with diabetes duration over 10 years, i.e.20 cases (33.33%) followed by 20% within 5-10 years.

Discussion

In current study, majority (30.33%) of the patients were of age between 50-59 years. That means maximum number of patient was found in the 6th decade, followed by 7th decade (60-69) which comprised 25%. Extremes of age i.e. below 40 years and above 70 years were relatively small 7 cases (11.67%) and 5 cases (8.3%) respectively. Likely explanation is that, most cases below 40 years were type 1 diabetes mellitus DM that rarely presents with chronic complication. And in case of above seventy, mortality is high due to co-morbidity. It is known that type 1 DM does not present with complication at presentation in contrast to that of type 2 DM that frequently presents with complications due to long asymptomatic period before diagnosis.[3] In our study, 34 (56.67%) patients were found to have significant proteinuria ≥300mg/dl, or albumin ≥200µg/L and/or microalbuminuria (20-200µg/L). 25 cases were male (41.67%) and 11 (18.33%) patients were female among the study population. This study does not match that seen at a diabetes centre in southern India. They measured 24 hours urinary protein excretion in frequency of proteinuria in type 2 DM. Proteinuria was diagnosed in 28% of the diabetic patients. The discrepancy probably resulted as we have conducted this study in hospital in patients those have frequent co-morbidities. Moreover, they included patients with ≥500mg/24 hrs protein excretion. We have studied ≥300mg/24 hrs protein excretion instead.

Retinopathy and other eye diseases (glaucoma, early cataracts) are an important cause of vision loss all over the world. Retinopathy virtually never appears within 3-5 years of type 1 diabetes or before puberty. Whereas up to 20% of patients with type 2 diabetes has retinopathy at the time of diagnosis. Among diabetics 37 cases having some sort of eye complications including 29 cases of retinopathy (48.33%). 8 (13.33%)

cases had proliferative retinopathy and 21 (35%) have non-proliferative retinopathy. 19 (65.5%) were male and 10 (34.5%) cases were female. Under 5 years duration of diabetes there were five cases: within 5-10 years 12 cases and above 10 years twenty cases having eye complications. 9 cases had significant eye diseases without significant proteinuria. Neuropathy was present in the form of bilateral loss of ankle jerks, or loss of vibration sense; or postural hypotension. Postural hypotension was not considered as neuropathy those receiving higher dose of diuretics or vasodilator antihypertensive. The Rochester Diabetic Neuropathy Study revealed 54% and 45% polyneuropathy in case of IDDM and NIDDM respectively. In our study, 27 (45%) of which males 19 (31.67%) and female 8 (13.33%) is consistent.

Conclusion

This study of sixty cases of diabetes mellitus may not reflect the exact situation in the community but its proximity to the reality cannot be underestimated. As Diabetes mellitus has relation with development of nephropathy with the course of duration of disease, therefore, physician should pay attention with the subjects with diabetes mellitus for long time during treatment.

Contribution of the authors:

First author was the main researcher, second author was the guide of the research work and third author did the statistical analysis of the research.

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Original Article

Effect of Aqueous Extract of *Aegle marmelos* Fruit and Leaf on Serum Insulin on Non Diabetic and Type 1 Model Diabetic Rats

Rupali Debnath[1], Masfida Akhter[2,] Murshida Aziz[3], Liaquat Ali[4]

Revised: August 22, 2014 Accepted: November 22, 2014

Abstract

Introduction: *Diabetes mellitus (DM) is one of the commonest endocrine and metabolic disorders affecting mankind all over the world. Plants are considered to be source of therapeutic agents. Aegle marmelos are used extensively in the indigenous system of medicine as an antidiabetic agent.*

Methods: *To see effect of aqueous extract of Aegle marmelos fruit and leaf on serum Insulin on non diabetic and type 1 model diabetic rats, this present study was carried out in Biomedical Research Group (BMRG), Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorder (BIRDEM), Dhaka. A total of 47 Long-Evans rats were taken for the experiment among which 23 were nondiabetic and 24 was diabetic rat. Both the Diabetic and non diabetic animals were fed with both extracts at a dose of 250 mg/kg/body weight/day.*

Results: *In the diabetic rats serum insulin values did not change significantly in the leaf extract group; however there was about 30% increase of insulin level in the fruit extract group which was not significant also.*

Conclusion: *It was concluded that that Aegle marmelos fruit and leaf had no significant effect on insulinaemic value on Diabetic or nondiabetic rat models.*

Key words: *Aegle marmelos, Insulinaemic value.*

NBMC J 2015; 1 (1): 11-16

Introduction

Diabetes mellitus (DM) is one of the commonest endocrine and metabolic disorders of mankind all over the world. It is widely recognized as one of the leading causes of death and disability worldwide.[1]

Conventionally, Type 1 Diabetes Mellitus (T1DM) is treated with exogenous insulin and Type 2 Diabetes Mellitus (T2DM) with synthetic oral hypoglycemic agents like sulphonylureas and biguanides. A substantial proportion of T2DM also require insulin.

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However, the existing therapeutic agents have considerable limitations in the management of this complex disorder and search for alternate agents are continuing all over the world.[2,3] Plants are considered to be source of treatment of diseases, as there are multiple therapeutic properties like antiulcer, antidiabetic, antihyperlipidaemic, anticancer, antimicrobial, radioprotective, antipyretic, analgesic and antispermatogenic effects.[4-7] The plant kingdom has become a target for multinational drug companies and research institutes for the discovery of new biologically active compounds and potential drugs.[8] The World Health Organization has recommended, specially in developing countries, the initiation of programmes designed to use medicinal plants more effectively in the traditional health care system.[7] The resolution of the 31st World Health Organization Assembly requested a complete inventory, and a thorough evaluation of the efficacy, safety and standardization of medicinal plants for the treatment of diabetes.[10] *Aegle marmelos* was originated in India and is presently growing in most of the countries of Southeast Asia. *Aegle marmelos* are used extensively in the indigenous system of medicine as an antidiabetic agent, so *A. marmelos* leaf has already shown great potential as a source of antidiabetic agent.[2,9,10] In fact, turning this potentiality into a scientifically validated product needs further work on the mechanism of action of the plant extract. Although some works have been done on the insulin releasing or B cell regenerating action of the leaf extract, a number of potential targets have not yet been investigated.[9,10]

Materials and methods

Aegle marmelos leaves and fruits were collected from Chapainawabgonj, a district of Rajshahi division. The aqueous extract of *A. Marmelos* fruit and leaf was made by standard method. A total of 47 Long-Evans rats were taken for the experiment among which 23 were nondiabetic and 24 were diabetic. *Aegle marmelos* fruit pulp was dried in sunlight for 5/6 days, coarsely powdered by grinder machine and stored in room temperature until the making of extracts. All the collected leaves were washed carefully again and again to get neat and clean leaves. Wet leaves were primarily spread over brown paper to soak the extra water. After soaking the water the leaves were spread over aluminum foil and crisp dried for 3 days at 48^0C in an oven. The dried leaves were crushed in an electric grinder to make a fine powder stored in room temperature until the making of extracts.

Every 100 gram *A. marmelos* fruit and leaf powder with 500 ml distilled water in a beaker was mixed. This mixer was mixed nicely with a spoon. The beaker was covered by aluminum foil and placed over magnetic stirrer with a magnate inside the beaker. The mixer was rotated at a rotation cycle of 600 rotations /min. The mixer was stirred for 8 hours. The mixer was sieved in beaker. The hard pellet was again mixed with 100 ml distilled water and again stirred for one hour and sieved. Combined liquid was taken in a round bottom flask and evaporated and concentrated in rotary evaporator under a temperature ranging from 40°-50°C and under a rotation at 60 rotations/min.

It was concentrated till the total liquid was changed into a viscous pest. This pest was freeze dried under vacuum of gel solid yield. The dry sample was stored in a reagent bottle at 4^{o}C in a freezer. The experiments were carried out on adult Long-Evans rats (125-220g) of both sexes, bred at BIRDEM animal house and maintained at a constant room temperature of 22 ± 5^{0}C with humidity of 40-70 % and the natural 12 hours day-night cycle. The rats were fed on a standard laboratory pellet diet and water supplied *ad libitum*, except during the day of experimental procedure. The influence of circadian rhythms was avoided by starting all experiments at 8.30 a.m. These diabetic model rats were induced by single injection of Streptozosin (STZ). After 7days of injection, injected rats were tested whether they had T1DM or not. The drug dose was 250 ml/Kg/10 ml. On '0' day after 12 hours fasting, body weight was taken and blood was collected from the tail tip by giving mild anaesthesia, centrifuged and serum used for measuring Insulin. Then for 14 days extract was feed with normal diet. On the 15^{th} day, blood was taken from tail tip by giving mild anaesthesia on them. Again blood was centrifuged and serum used for measuring Insulin. Values were calculated by SPSS (V. 19) and result was made.

Results

Table 1 shows effects of aqueous extracts of *A. marmelos* fruit and leaf on insulin of nondiabetic rats during 0-15 days time period. Insulin (ng/dl, Mean ± SD) of the *A. marmelos* fruit group (n=9) was 1.41±0.47 (on `0´ day) and 1.08±0.44 (on `15´ day), *A. marmelos* leaf group (n=4) was 0.59±0.34 (on `0´ day) and 0.57±0.13 (on `15´ day). In *A. marmelos* fruit group percentage deviation '0' day versus '15' day (ng/dl, Mean ± SD) was 17.28±39.53 and in *A. marmelos* leaf group was 0.8±.22. In percentage deviation, no significant difference was found between two groups. In paired' test in *A.*

marmelos fruit and *A. marmelos* leaf group no significant difference was found.

Table 1: Effect of aqueous extracts of *A Marmelos* fruit and leaf on insulinaemic status of nondiabetic rats

Group & parameter	**0 day (M±SD) *Insulin(ng/dl)***	**15 day *Insulin(ng/dl)***	**t/p value**	**Deviation from 0 day (%)**
AMFE (n=9)	1.41±.47 (100)	1.08±.44 (82.72±39.53)	1.14/.199	17.28±39.53
AMLE (n=4)	.59±.34 (100)	.57±.13 (99.2±.22)	1.71/.185	0.8±.22

Note: Comparison between 0 day (baseline) and 15 day values of the same group was compared by Paired- t test. Values were expressed as Mean±SD. P<0.05 was considered as statistically significant, n= number of subjects; AMFE group=*Aegle Marmelos* fruit extract treated group, AMLE group=*Aegle Marmelos* leaf extract treated group.

Table 2: Effect of aqueous extracts of *A. marmelos* fruit and leaf on insulinaemic status of diabetic rats

Group & parameter	**0 day (M±SD) *Insulin(ng/dl)***	**15 day *Insulin(ng/dl)***	**t/p value**	**Deviation from 0 day (%)**
AMFE (n=8)	.25±.09 (100)	.32±.16 (130.55±46.05)	-1.79/.116	-30.55±46.05
AMLE (n=7)	.27±.18 (100)	.24±.17 (87±101.50)	.48/.647	13.73±101.50

Note: Comparison between 0 day (baseline) and 15 day values of the same group was compared by Paired- t test. Values were expressed as Mean± SD. P<0.05 was considered as statistically significant, n= number of subjects; AMFE group=*Aegle marmelos* fruit extract treated group, AMLE group=*Aegle marmelos* leaf extract treated group.

Discussion

It was evident that in nondiabetic rats (who have healthy beta cells) serum insulin values increased over a period of 15 days which may be a normal fluctuation over a growing period. In the two treatment groups, the value did change from baseline and there is no consistent difference between the groups. In the diabetic rats, serum insulin values did not change significantly in the Leaf Extract group; however there was about 30% increase of insulin level in the Fruit Extract group. It seems that the hypoglycaemic effect of the aqueous extract of *A. marmelos* fruit is mediated by increased secretion of insulin in the diabetic model rats. It was also previously[3-6] suggested that the antidiabetic effect of *A. marmelos* fruit may probably be due to the potentiation of insulin secretion from ß cells. It is unclear whether the rise in insulin level is due to stimulation of secretion in existing beta cells or prevention of further damage in the cells. The regeneration of cells may also be conceived and all these need further investigation with *in vivo* as well as *in vitro* techniques.

In contrast to the fruit extract the leaf extract of *A. marmelos* did not show any hypoglycaemic activity in nondiabetic or diabetic model rats in the present study. Also it did not show any significant effect on serum insulin level of the rats. The finding in nondiabetic rats is in contrast with the finding[11-13] where it was found the antihyperglycemic and insulin releasing effects of *A. marmelos* leaves on normal fasted rabbits. The finding in diabetic rats is also in contrast with the observation[11] which had reported hypoglycaemic and insulin releasing properties of *A. marmelos* leaf extract in similar model rats.

Conclusion

It may be concluded that *Aegle marmelos* fruit and leaf has no significant effect on insulinaemic value on Diabetic or nondiabetic rat.

Contribution of the authors

First author was the chief researcher, second and third authors helped in data collection. Fourth author was the guide of the research work.

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Original Article

Effect of Random Blood Sugar (RBS) on In-Hospital Outcome of Acute Myocardial Infarction in Diabetes Mellitus

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Abstract

Introduction: *Hyperglycaemia is one of the causes of coronary artery disease in Diabetic patient. Control of glucose level reduces the mortality and morbidity in coronary artery patient with diabetes.*

Methods: *This prospective observational study was carried on a total of 82 adult diabetic patients with acute myocardial infarction, in the Department of Medicine, Dhaka Medical College, Dhaka, over a period of six months.*

Results: *The mean age was 58.39 years with standard deviation of mean of ±15.58 years and their age ranged from 30 to 74 years. In this present study 62.19% were male and rest 37.81% were female. It was observed that most (78.04%) had random blood sugar (RBS) level between 16-20 mg/dl during the time of admission. Mean RBS among the survivors and non- survivors ware 14.85 mg/dl and 20.74 mg/dl respectively, and the difference was statistically significant. Overall mortality of diabetic patients in acute myocardial infarction was 5 in 82# (6.09%) in the present study.*

Conclusion: *Diabetes mellitus has relation with development of nephropathy with the course of duration of disease. So, physician should pay attention to the diabetes mellitus patients for long time during treatment.*

Key words: *Acute Myocardial infarction, Random blood sugar, Diabetes Mellitus.*

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Introduction

Acute Myocardial Infarction (AMI) can be considered as a potential epidemic for mankind.The hospital mortality rate of acute Myocardial Infarction in Bangladesh is 2.54 %.[1]

AMI is one of the most common diagnoses in hospitalized patients in industrialized countries. In the United States, approximately 650000 experience a new AMI and 450000 experiences a recurrent AMI each year.

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The early (30 days) mortality rate from AMI is 30%, with more than half of these deaths occurring before the affected individual reaches the hospital. Although the mortality rate after admission for AMI has declined by 30% over the past two decades.[2] Myocardial infarction (MI) is a common presentation of ischemic heart disease (coronary artery disease). The World Health Organization estimated in 2004, that 12.2% of worldwide deaths were from ischaemic heart disease; with it being the leading cause of death in high or middle income countries and second only to lower respiratory infections in lower income countries.[3] Worldwide more than 3 million people have ST segment elevation myocardial infarction (STEMIs) and 4 million have Non ST-segment elevation myocardial infarction (NSTEMIs) per year.[4,5] Rates of death from ischemic heart disease have declined in most high income countries, although cardiovascular disease still accounted for 1 in 3 of all deaths in the USA in 2008.[6] In contrast, ischaemic heart disease is becoming a more common cause of death in the developing world. For example in India, ischaemic heart disease had become the leading cause of death by 2004 accounting for 1.46 million deaths (14% of total deaths) and deaths due to ischaemic heart disease were expected to double during 1985–2015.[5] Globally it is predicted that disability adjusted life years (DALYs) loss due to ischaemic heart disease will account for 5.5% of total DALYs in 2030, making it the second most important cause of disability as well as the leading cause of death by this date.[7]

Patients with DM are at increased risk of developing cardiovascular diseases and have greater morbidity and mortality.[5] It has been shown that diabetic patients without previous MI and cardiovascular disease have as high a risk of MI as nondiabetic patients with previous MI and cardiovascular disease.[6, 7, 9] It has also been documented that in-hospital and long term morbidity and mortality are increased in patients with diabetes.[7-12]

Several studies regarding diabetes mellitus with AMI had been conducted in our country but a very few studies had conducted regarding effect of random blood sugar in Bangladesh.

Materials and methods

This observational study was carried out to evaluate 82 subjects aged 30-74 years suffering from AMI in the Department of Medicine, Dhaka Medical College, Dhaka with the general objective to evaluate the in-

hospital outcome of acute myocardial infarction among the patients with diabetic mellitus. The study subjects were enrolled in this study after fulfillment of the inclusion criteria and MI was diagnosed on basis of ECG findings. The objective of the study was discussed in details with the patients or their attendants before their decision to enroll themselves into the study. ECG report was collected from previous ECG investigation or during bedside ECG. Demographic information was prospectively recorded and substantiated by means of inspection of medical record. Information included was the subject's age, gender, medical history, including history of diabetes. Comparison between RBS in outcome of AMI was done by independent t-test.

Results

A total of 82 cases were included in the study. The mean age was 58.39 years with standard deviation of mean (SD) ±15.58 years and their age ranged from 30 to 74 years. Majority [40 (38.09%)] of the respondents was found in the age group of 51-60. About 34.28% subjects were found in 41-50 years age group. Fourteen (13.33%) subjects had age below 40 years. Fifteen (14.30%) subjects belonged to 61 years and above age groups. Out of total 82 subjects, 51 (62.19)% were male and 31 (37.81)% were female (Figure 2).

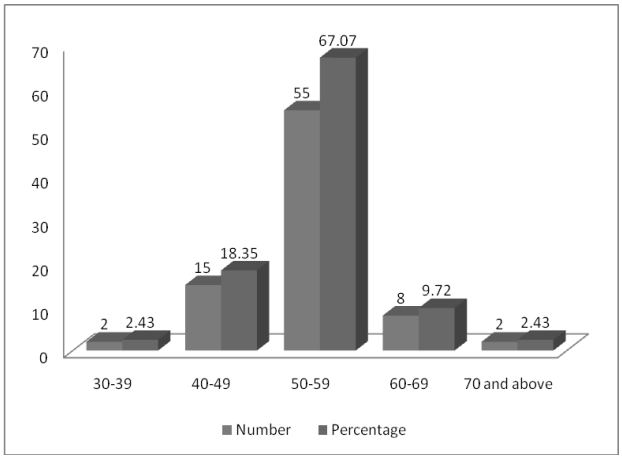

Figure 1: Bar diagram showing age distribution of the study subjects.

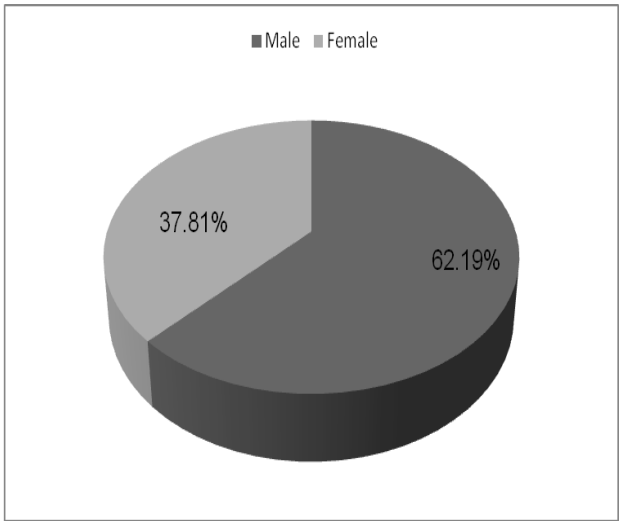

Figure 2: Pie chart showing gender distribution of the study subjects.

The mean duration of diabetes, was 6.73 (±3.22) years (Table I). The respondents suffered from diabetes for 3 to 10 years.

Majority (54.87%) of the subjects had diabetes for more than 5 years.

Table I: Duration of diabetes mellitus in the study subjects

Duration of Diabetes (years)	N	%
≤5	37	45.13
>5	45	54.87
Mean±SD	06.73±03.22	
Range (Minimum-maximum)	03-10	

It was revealed that most 64 (78.04%) had random blood sugar (RBS) level between 16-20 mg/dl during the time of admission. 12 (14.63%) subjects had random blood sugar (RBS) level between 10-15 mg/dl. Only 6 (7.33)% had a level of blood sugar at 21 mg/dl and above. In general mean RBS among the study subjects was 14.27±08.92 mg/dl. Mean RBS among the survivors and non- survivors ware 14.85 mg/dl and 20.74 mg/dl respectively and there was statistically significant difference between mean RBS between the survivors and non- survivors (Table II).

Table II: Glycaemic (RBS) status of the study subjects during admission (n=82)

RBS (mg/dl)	N	%
10-15	12	14.63
16-20	64	78.04
21 and above	06	07.33
Mean ± SD (mg/dl)	14.27±08.92	
Mean ± SD (mg/dl) in survivors	14.85±5.58	t/P value
Mean ± SD (mg/dl) in non-survivors	20.74±03.65	2.54/0.025

Note: S= significant, P value reached from t – test and value was considered significant when P<0.05

Discussion

Among the 82 cases of acute myocardial infarction with diabetes mellitus under study the mean age was 58.39 years and their age ranged from 30 to 74 years. Majority of the respondent was found in the age group of 51-60. This present study findings are very much comparable with the described epidemiology [8, 15] of diabetic acute MI patients.

The mean RBS among the study subjects was 14.27±08.92 mg/dl. Mean RBS among the survivors and non- survivors were 14.85 mg/dl and 20.74 mg/dl respectively and there was statistically significant difference between mean RBS between the survivors and non-survivors. So, it could be assumed that higher blood glucose level might have effect on mortality among the diabetic subjects with acute MI. In a recent study, Krishna et al. (2012) [13] found that 40% mortality occurred in those having plasma sugar levels (PSL) >126mg% at the time of admission. Although mortality rate in the present study was lower (6.09%) than the study conducted by Krishna et al.[13] it was clear from these both studies that hyperglycemia was one of the contributing factors for mortality in diabetic MI subjects.

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Conclusion

From the study findings it could be concluded that diabetic subjects with AMI had poor Glycaemic control and this uncontrolled blood sugar level had significant effect on mortality rate. So physicians should pay extra attention in case of diabetic patients with acute MI to reduce mortality and other complications efficiently.

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Original Article

Nerve Conduction Abnormalities in Patients with Diabetes Mellitus

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Abstract

Introduction: *Diabetic Neuropathy is the most common complication of long-term diabetes mellitus (DM). Neuropathy can be diagnosed by nerve conduction study.*

Methods: *This case control study was conducted over a period of one year with the aim to assess peripheral nerve conduction abnormalities in diabetic patients in the department of neuro-medicine, BIRDEM.*

Results: *A total number of 33 diabetic patients with peripheral neuropathy and 22 diabetic control subjects without peripheral neuropathy were enrolled on basis HbA_1C in this study. DM was diagnosed on basis of World Health Organization criteria (1997) and nerve conduction velocity was measured by electro-physiology. It was observed that the diabetes neuropathy (DN) ones showed higher Ulnar nerve distal latency (UD Latency) (msec, M±SD; 3.18±0.94 Vs 5.28±2.32, p<0.001), lower compound muscular action potential (PCAMP) (µV, 4.28±1.71 Vs 2.20±1.40, p<0.001), lower peripheral nerve conduction velocity (PNCV) (m/sec, 47.54±3.40 Vs 40.96±6.37, p<0.001), higher Sural nerve distal latency (SUD Latency) (msec, 2.11±0.54 Vs 2.40±0.24, p<0.005) and lower sensory ulnar nerve conduction velocity (UNCV) (m/sec, 46.91±4.09 Vs 42.96±5.94, p<0.005).*

Conclusion: *It was concluded that both ulnar (Motor as well as sensory functions) and peroneal nerves (only Motor function) are affected in middle aged type 2 DM patients, was as sural nerve is least affected.*

Key words: *Nerve Conduction Abnormalities, Diabetes Mellitus.*

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Introduction

Diabetes mellitus is a chronic disorder, if not properly treated leads to long-term macrovascular and microvascular complications affecting tissues such as heart, kidney, retina and peripheral nerves. Although defective insulin secretion or insulin resistance are the basic disorders of diabetes but other factors such as genetic susceptibility of certain ethnic groups, environmental and behavioral factors such as sedentary life style, nutrition and obesity are also important.[1]

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But actual reason underlying this disorder is not entirely clear. During the last ten year it has been established that diabetes mellitus is not a single disease but a heterogeneous group of disorders characterized by hyperglycemia with varying degrees of insulin insufficiency and insulin resistance.[2] Diabetic neuropathy is a descriptive term meaning a demonstrative disorder, either clinically evident or subclinical, that occurs in the setting of diabetes mellitus without other causes of peripheral neuropathy. It has been suggested that microvascular disease plays a more important role in development in type 2 than in type 1 diabetes where etiology is metabolic rather than vascular.[3] In the pathogenesis of human diabetic neuropathy no single cause can fully explain its development and progression.[4] A wide range of disturbance may affect the peripheral nervous system.[5] Prevalence rate for diabetic neuropathy are sparse and it is virtually impossible to obtain reliable estimates of the prevalence of neuropathy among the diabetic population. The prevalence of diabetic neuropathy appears to be parallel with duration severity of hyperglycemia in both type-1 and type-2 diabetes.[6,7,8] Studies have confirmed the predominance of men and an association with height and increasing age (irrespective of duration of diabetes). Smoking and microalbuminuria are also seemed to be risk factors for diabetic neuropathy.[9,10]

Materials and methods

This observational case control study was carried out in the department of Neuromedicine, BIRDEM over a period of one year enrolling a total number of 33 diabetic patients with peripheral neuropathy and 22 diabetic control without peripheral neuropathy. Cases and Controls were selected on basis of HbA_{1c} level neuropathic complains & clinical neurological examination. Pregnant subjects, diabetic with acute complication and subjects with chronic illness were excluded. After taking proper informed consent, fasting blood glucose were measured and nerve conduction velocity was measured by standard EMG machine in room with a temperature of 37^{o}C. Data were analyses by SPSS (v. 10) and expressed as Mean (±SD). Comparison between groups was done by independent t-test.

Results

In Diabetic subjects without neuropathy group, Ulnar nerve distal latency (mean±SD, msec) was 3.18±0.94. Mean±SD of compound muscle action potential was 7.40±1.22 µV;

p=0.151 and Ulnar Motor nerve conduction velocity (mean±SD, m/sec) was 48.67±4.69.

In Diabetic subjects with neuropathy group, Ulnar nerve distal latency (mean±SD, msec) was 5.28±2.32. Mean±SD of compound muscle action potential was 6.61±2.72 µV and Ulnar Motor nerve conduction velocity (mean±SD, m/sec) was 49.63±6.56; p=0.529.

In Diabetic subjects without neuropathy group, peroneal nerve distal latency (mean±SD, msec) was 10.37±3.02; p=0.282. Mean±SD of peroneal compound muscle action potential was 4.28±1.71µV; p=<0.001 and peroneal nerve conduction velocity (mean±SD, m/sec) was 47.54±3.40; p=<0.001.

In Diabetic subjects with neuropathy group, peroneal nerve distal latency (mean±SD, msec) was 11.57±4.39; p=<0.282. Mean±SD of peroneal compound muscle action potential was 2.20±1.40µV; p=<0.001 and peroneal nerve conduction velocity (mean±SD, m/sec) was 40.96±6.37; p=<0.001.

In Diabetic subjects without neuropathy group, Sural nerve distal latency (mean±SD, msec) was 3.65±1.10; p=0.184. (Mean±SD) of sural sensory action potential was 16.39±10.53 µV; p=0.085 and Sural nerve conduction velocity (mean±SD, m/sec) was 45.08±7.55; p=0.087.

In Diabetic subjects with neuropathy group Sural nerve distal latency (mean±SD, msec) was 3.99±0.39; p=<0.184. (Mean±SD) of sural sensory action potential was 12.08±4.42µV; p=<0.085 and Sural nerve conduction velocity (mean±SD, m/sec) was 42.08±2.41; p=0.087.

Table I: Latencies of nerves in different groups

Variable	Non-DN(n=22)	DN(n=33)	t/p value
UD latency (msec)	3.18±0.94	5.28±2.32	-4.66/<0.001
UCAMO (µV)	7.40±1.22	6.61±2.72	1.46/0.151
MU CAMP (m/sec)	48.67±4.69	49.63±6.56	-0.63/0.529
PD Latency (msec)	10.37±3.02	11.57±4.39	-1.09/0.282
P CAMP (µV)	4.28±1.71	2.20±1.40	4.25/<0.001
P NCV (m/sec)	47.54±3.40	40.96±6.37	4.55/<0.001
SUD Latency (msec)	2.11±0.54	2.40±0.24	-2.357/0.026
USNAP (µV)	19.66±7.81	17.65±5.63	1.042/0.304
UNCV (m/sec)	46.91±4.09	42.92±5.94	2.948/0.005
SD Latency (msec)	3.65±1.10	3.99±0.39	-1.36/0.184
S SNAP (µV)	16.39±10.53	12.08±4.42	1.78/0.085
S NCV(m/sec)	45.08±7.55	42.08±2.41	1.78/0.087

Note: Non DN= Diabetic subjects without neuropathy, DN= Diabetic subjects without neuropathy, UD Latency=Ulnar nerve distal latency, PCAMP=Lower compound muscular action potential, PNCV=Lower peripheral nerve conduction velocity, SUD Latency=Higher Sural nerve distal latency, UNCV=Lower sensory ulnar nerve conduction velocity.

Discussion

Diabetic neuropathy (DN) is one the least understood complications of diabetes mellitus leading to still inadequate definition, classification and intervention guidelines. It is now regarded as a syndrome comprising of several mono and poly neuropathies involving somatic as well as autonomic nerves.[1,2] It is very often difficult to ascertain to what extent the confounding factors are responsible for the subclinical or clinical forms of the disorder in a particular population. In current study subjects were from a hospital based population and the diagnosis was confirmed by measurement of nerve conduction velocity (NCV) s which is gold standard upto the moment. Analysis of the NCV parameters in the non Diabetic and Diabetic group led to an idea regarding the site and nature of nerve involment in the present type 2 DM subject. It was apparent that both ulnar and Peroneal nerves were highly affected, but the Sural nerves were still protected to a great extent. There was also difference in the details of abnormalities between the ulnar and Peroneal nerves. Decrease in the Compound Muscle Action Potential and Nerve conduction velocity was the main defects in the Peroneal nerve (As PD Latency remaining not different from Non-DM group). The site and pattern of nerve involvement in these patients are, in general, similar to those found in the literature[5,7,8] and in a young diabetic group in the same population.[4] It can thus be inferred that in this middle aged Bangladeshi type 2 diabetic populations a number of electrophysiology abnormalities are present in ulnar (both Motor and Sensory) and Peroneal (only motor) nerves, but Sural nerve is somehow spared.

Conclusion

It was concluded that both Ulnar (motor as well as sensory functions) and Peroneal nerves (only motor function) were affected in middle aged type 2 DM patients where as Sural nerve was least affected.

Contribution of the authors

First author was the principle researcher, second and third authors helped in data collection. Third author also did the statistical analysis of the research.

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Original Article

Relationship of Antenatal Care of the Pregnant Mothers with Birth Weight of the Newborn

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Abstract

Introduction: *Birth weight is the single most important determinant of infant survival, healthy growth and development. Low Birth Weight babies carry relatively higher risk of perinatal and neonatal mortality and substandard growth and development subsequently.*

Methods: *This was a cross-sectional study carried out at Rajshahi Medical College Hospital for a period of one year to explore the relationship between the utilization of antenatal care (ANC) and the birth weight of the newborn. A total 301 pregnant mothers were selected purposively and data were collected with a pre- tested questionnaire.*

Results: *Among the respondents, 84.6% mother had received antenatal care. The prevalence of low birth weight (LBW) was 6.1% among the ANC recipient mothers and 43.9% were non ANC recipients. The association between birth weight and ANC was statistically significant [complete, incomplete or no antenatal care] [x^2 = 45.014, p< 0.001]. Most of the literate respondents (90.0%) received ANC. On the other hand majority of illiterate mothers (52.0%) did not receive ANC in last pregnancy. The relationship between education and ANC was statistically highly significant (P = 0.000). About Thirty Nine percent respondents with gestational age ≥ 37 weeks and 61.1% women with gestational age less than 37 weeks had delivered LBW babies respectively. The association between the gestational age and birth weight was statistically highly significant.*

Conclusion: *The study revealed that ANC has remarkable influence on birth weight of the newborn. Pregnant mothers should be motivated to utilize ANC properly for the promotion of reproductive health and reduction of LBW incidence in the country.*

Key words*: ANC, Birth Weight, Gestational age*

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Introduction

According to UNICEF, about 18 million infants are born with low birth weight (LBW) globally every year. Morbidity and mortality rates among such neonates are very high.[1] Birth weight less than 2.5 kg (up to and including 2499 gm), the measurement being taken preferably within first hour of life, before significant weight loss has occurred is termed as LBW.[2] LBW is a major public reproductive health problem in many developing countries. It is around 20%-30 % or even higher as compared to 3% - 5% in developed country.[3]

ANC refers to the care of the women during pregnancy. Ideally mother should receive antenatal visit once a month for 7 months, twice a month during the next month; and thereafter, once a week, if everything is normal. A high proportion of mothers in Bangladesh are working women. In these case, minimum 3 visits -1st visit at 20 weeks, 2nd at 32 weeks and 3rd at 36 weeks are required.[3-5]

Maternal malnutrition, obstetric and medical complications, associated with pregnancy, heavy work during pregnancy, high parity and very close birth spacing, intrauterine infection, pregnancy in very young age, body built of mother are regarded as maternal factor of LBW. A study in rural Bangladesh revealed that 24% babies were born with LBW and mean birth weight was 2961 g. It also showed that LBW was associated with mother's age, weight, parity, and Hb level, weight gain and health problems during pregnancy, tobacco consumption, and gestational age.[4-14]

Studies showed that mother's age, education, occupation, yearly income, gravid status, gestational age at first visit, number of antenatal care visit attended, quality of antenatal care received and pre-delivery body mass index had significantly associated with the incidence of LBW.[5,10,12,14] Oruamabo RS and John CT found that at birth, 8.9% of the singleton babies and 70% of those of multiple birth weighed less than 2500 g. Maternal factors significantly associated with increased incidence of LBW were antepartum haemorrhage, short stature, age and parity.[6, 10] A hospital based study in India revealed that proportion of LBW was 23.8%. Proportion of LBW was higher among babies born to mothers aged < 20 yrs of age (50.0%), poorly educated (32.6%), family income < Rs. 2000 per capita, (28.9%), poorly nourished with pre-pregnancy weight < 45 kg (50.0%), as compared to others. Primi mothers were comparatively at lower risk of delivering

LBW babies as compared to multi-gravida mothers. Low literacy level, low per capita income, birth order two and above and maternal age above 30 years were found to be significant risk factors of LBW.[1,11] A study in Rajshahi Medical college Hospital showed LBW is more prone to develop asphyxia, intracranial birth injury, infection and hypothermia. Death of LBW infants is 30 times more frequent than death of new born of normal birth weight.[7] In another study in a periurban setting in Bangladesh revealed that LBW is an important cause of perinatal, neonatal and post neonatal mortality and morbidity.[7,8] The present study was carried out to explore the utilization of antenatal care by the pregnant mothers delivered at Rajshahi Medical College Hospital and to observe the relationship between antenatal care and birth weight of the newborn.

Materials and methods

This was a cross-sectional type of descriptive study carried out at Rajshahi Medical College Hospital for the period of one year. All the pregnant mothers admitted at Obstetric ward in Rajshahi Medical College Hospital (RMCH) constituted the study population for the present study. Mothers delivered baby in RMCH and birth weight of the newborn recorded within first hour were included in the study. On the other hand, mothers with toxaemia of pregnancy, suffering from medical problems and unconscious were excluded from the study. Purposive sampling technique was applied to select 301 mothers from the study population. Data were collected by face to face formal interview on socio-demographic, economic information as well as current pregnancy, Antenatal care with its different elements of the research participants using a pre-tested questionnaire. The aim and purpose of the study was explained to every participant before obtaining informed written consent. Thorough clinical examination of new born with prior permission of the mothers was carried out. The researcher himself measured the weight of the new born within 1st hour of life using Baby Weight Machine (Yamoto, Manufactured by Japan). Hospital records such as patient's register, treatment files were reviewed to collect data for the present study. Document review for the current study was providing data to analyze and make internal comparison between study variables.

Results

The results have been described in the following sections with tables.

Table I: Socio-demographic characteristics of the study subjects (N= 301)

Variable	N (%)	Mean±SD
Age in years		23.34±4.71
<18	12(4.0)	
18-23	164(54.5)	
24-29	83(27.6)	
30-35	38(12.6)	
>35	4(1.3)	
Religion		
Islam	284(94.4)	
Hinduism	17(5.6)	
Education		
Illiterate	25(8.3)	
Primary	72(23.9)	
High school	112(37.2)	
SSC and HSC	68(22.6)	
Graduate and above	24(8.0)	
Occupation		
House wife	291(96.7)	
Doing job outside	9(3.3)	
Monthly family income(Taka)		
Tk. ≤3000	67(22.3)	
Tk.3001- Tk. 4500	47(15.6)	
Tk.4501- Tk. 7500	94(31.2)	
Tk.7501- Tk. 10000	49(16.3)	
Tk. >10000	44(14.6)	
Number of children in the family		
1	175 (58.1)	
2	90(29.9)	
>2	36(12.0)	

The study revealed that 54.5% respondents were in the age group of 18-23 years. Respondents from extreme age group were few. The mean age of the respondents was 23.34 years and standard deviation ± 4.71. Most of the respondents [284 (94.4%)] were Muslim. About education, 91.7% respondents were literate. Regarding monthly family income, 31.2% mothers had family income Taka (4501 – 7500) and 22.3% respondents had monthly income Taka 3000 and below. It was reported that majority of the respondents [175 (58.1%)] had one child and only 12.0% respondents had more than 2 children.

Table II: ANC Status of the respondents in last pregnancy

Antenatal care (ANC)		Frequency	
		N	**%**
Not received ANC		41	13.6
Received	Incomplete	53	17.6
	Complete	207	68.8
Total		301	100.0

It was found that majority 207 (68.8%) received complete ANC and about 53 (18) % had incomplete ANC from health care facilities (Table II).

Table III: Minimal pathological test during last pregnancy ANC visit (n = 260)

Minimal pathological test		Frequency	
		N	%
Hb%	Done	209	80.4
	Not done	51	19.6
Urine test	Done	200	76.9
	Not done	60	23.1

It was revealed that most of the respondents 209 (80.4%) had estimated their Hb% and 76.9% had done their urine test during last pregnancy (Table III).

Table IV: ANC advices received during last pregnancy (n = 260)

ANC advices	Frequency	
	Received	Not received
	N (%)	N (%)
Diet	248(95.4)	12(4.6)
Drugs	255(98.1)	5(1.9)
Family planning advice	104(40.0)	156(60.0)
Immunization(TT)	297(98.7)	4(1.3)
Personal hygiene	242(93.1)	18(6.9)

It was found that most of the respondents received advice about diet, dugs, immunization (TT) and personal hygiene (95.4%, 98.1%, 98.7% and 93.1% respectively) but family planning advice received only104(40%) in the last pregnancy (Table IV).

Table V: Birth weight of the new born.

Birth weight		Frequency	
		N	Total (%)
Low birth wt.	< 2 Kg	10	**36(12.0)**
	2-<2.5 Kg	26	
	Total		
	36		
Normal birth weight	2.5-<3.00 Kg	77	**265(88.0)**
	3.0 - <3.5 Kg	125	
	3.5-<4.0 Kg	51	
	≥ 4.0 kg	12	
	Total	**265**	
Total		**301**	**301(100.0)**

Mean=2.95 Median=3.0 SD=0.517 Range=2.75

Table V shows that most of the women [265 (80.0%)] delivered normal birth weight baby and 12.0% mothers delivered LBW baby. The mean birth weight was 2.95 kg and standard deviation 0.517. Regarding the gestational age, majority of the mothers (66.1%) delivered at and beyond 37 weeks of gestation.

Table VI: Relationship between birth weight and some selected variables

Independent variable		Dependent variable Birth weight		*P* value
Antenatal care (ANC)		**Low birth weight (< 2.5 kg)**	**Normal birth weight (≥ 2.5 kg)**	
		N (%)	**N (%)**	
No ANC		18(43.9)	23(56.1)	*P* = 0.00
Received ANC	Incomplete (<3 visits)	10(18.9)	43(81.1)	
	Complete (≥ 3 visits)	8(3.9)	199(96.1)	
Received advice on diet, n = 260				
Received		16(6.5)	232(93.5)	*P* = 0.173
Not received		2(16.7)	10(83.3)	
Received advice on drugs, n = 260				
Received		17(6.7)	238(93.3)	*P* = 0.173
Not received		1	4(80.0)	
Received advice on FP				
Received		7(6.7)	97(93.3)	
Not received		11(7.1)	145(92.9)	*P* > 0.05
TT immunization				
Received		17(6.6)	242(93.4)	*P* = 0.000
Not received		1(100.0)	0(0.0)	
Advice on personal hygiene				
Received		16(6.6)	226(93.4)	*P* = 0.468
Not Received		2(11.1)	16(88.9)	
Hb% estimation				
Done		15(7.2)	194(92.8)	*P* > 0.05
Not done		3(5.9)	48(94.1)	
Urine examination				
Done		13(6.5)	187(93.5)	*P* > 0.05
Not done		5(8.3)	55(91.7)	
Educational status				
Illiterate		8(32.0)	17(68.0)	*P* = 0.001
Literate		28(10.1)	248(89.9)	
Monthly income in Taka				
< 4500		15(13.5)	96(86.5)	*P* = 0.526
≥ 4500		21(11.1)	169(88.9)	
Gravid status				
Primi gravid		14(9.1)	140(90.9)	*P* = 0.116
Multigravida		22(15.0)	169(88.9)	
Mother's gestational age				
< 37 wks		22(61.1)	80(30.2)	*P* = 0.000
≥ 37 wks		14(38.9)	185(69.8)	

It was revealed that among the complete and in-complete ANC recipient mothers, 3.9% and 18.9% delivered LBW babies respectively. Among the ANC non recipient mothers, 43.9% had LBW. The prevalence of normal birth weight babies was higher among the mothers with complete ANC (96.1%) than that of mothers received incomplete ANC. The association between receive of ANC and birth weight of new born was highly significant statistically (x^2 = 45.014, *df* = 2, *P* = 0.000) [Table-VI].

It was found that 6.5% women received advice on diet who delivered LBW babies while 16.7% mothers did not receive advice on diet delivered LBW babies. The relationship between birth weight and advice on diet was not significant statistically

(x^2 =1.854, *df* = 1, *P* = 0.173). Among the TT vaccinated women, 6.6% of the new born had LBW and the association between TT vaccination and LBW was statistically highly significant (x^2 = 13.496, *df* = 1, *P* = 0.000). The relationship between advice on personal hygiene and birth weight of new born was not significant statistically (x^2 = 0.526, *df* = 1, *P* = 0.468).

The study showed that higher proportion (32.0%) of illiterate mothers delivered LBW than that of literate mothers (10.1%). The association between educational level and birth weight of the new born was statistically highly significant (x^2 = 10.399, *P* = 0.001, *df* = 1). On the other hand the relationship between birth weight of the new born and monthly income was statistically not significant (x^2 = 0.403,*P* =0.526 ,*df* = 1). The proportion of multi gravida mothers (15.0%) was higher than that of primi mothers (9.1%) delivered LBW babies. The relationship between gravida and birth weight of the new born was statistically not significant (x^2 = 2.465, *P* =0.116, *df* =1). About 61.0% of the respondents had LBW baby with gestation age below 37 weeks and 39.0% mothers delivered LBW baby with complete gestational age (≥ 37weeks**)**. The association between gestational age and birth weight was statistically highly significant (x^2 = 28.211, *P* = 0.000, *df* = 2).

Discussion

Regarding age distribution, majority (54.5%) of the respondents was in the age group of 18-23 years. Mothers within 18-23 years was higher because of women are more fertile in this age group in our country. Most of the respondents (94.4%) were Muslim that indicates the Muslims are predominant in Bangladesh population but the data are not consistent with religion distribution published by Bureau of statistics.[16] The monthly family income of the majority of the respondents (31.2%) was Taka 4501 - 7500. About 22.3% mothers had monthly income Taka 3000 and less. The mean monthly income was Taka 7623.26. The results showed that majority of the mothers belonged to low income family.

Most of the mothers (86.4%) received ANC in last pregnancy. But the result is not similar with other studies carried out by UNICEF.[16] It was due to people's awareness about the importance of antenatal care for safe delivery and healthy baby with optimum birth weight.

It is highly encouraging that most of the mothers (95.4%) received advice about diet from their ANC providers. A good proportion of pregnant women (60.0%) did not receive advice on FM methods during ANC visit. It indicates ANC providers are reluctant about giving advice on FM. Most of the respondents (98.7%) received TT vaccine which is quite satisfactory. Most of the new born (88.0%) had normal birth weight (2.5-4.0 kg) and about 12.0% babies had LBW. The prevalence

of LBW is low among the study mothers in comparison to other parts of the country. In Bangladesh the prevalence of LBW is 36%.[14] For the present study majority of the pregnant women received ANC which might help them to maintain optimum nutritional status. About 44.0% ANC non recipient mothers had LBW babies. The findings confirmed that birth weight and ANC status was statistically highly significant. The finding of the present study is in agreement with many similar studies in developing countries.[5, 12, 13, 15]

It was revealed that higher proportion of illiterate mothers (32.0 %) delivered LBW babies than that of literate mothers (10.1 %). The association between education and birth weight was statistically highly significant (P = 0.001). The finding is consistent with others similar studies.[1, 5, 13, 14.] About monthly family income has no significant relation with birth weight (P = 0.911).These findings were not consistent with the other similar studies.[1, 5, 13, 14] The association between the gestational age and birth weight was statistically highly significant (P = 0.000). Similar result also observed by Neeraj Agarwal et al and V.P.Reddiash et al at All India Institute of Medical Science , New Delhi.

Conclusion

The study findings concluded that birth weight and ANC status was statistically significant. The existing MCH programme should be strengthen to cover all the pregnant women.

Contribution of the authors

First author was the principle researcher. Second and third authors did the statistical analysis of the research.

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Review Article

European Guidelines for the Diagnosis and Management of Osteoporosis in Postmenopausal Women

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Abstract

The European Foundation for Osteoporosis and Bone disease (subsequently the International Osteoporosis Foundation) published guidelines for the diagnosis and management of osteoporosis in 1997. This manuscript updates these in a European setting. Here guidance is provided on the assessment and treatment of postmenopausal women with or at risk from osteoporosis. The following areas are reviewed; the role of bone mineral density measurement for the diagnosis of osteoporosis and assessment of fracture risk, general and pharmacological management of osteoporosis, monitoring of treatment; assessment of fracture risk, case finding strategies and investigation of the patients. Here a platform is provided on which specific guidelines can be developed for national use.

Keywords: *Bone mineral density, Diagnosis of osteoporosis, Fracture risk assessment, Treatment of osteoporosis.*

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Introduction

Osteoporosis is defined as a systemic skeletal disease characterised by low bone mass and micro architectural deterioration of bone tissue, with a consequent increase in bone fragility and susceptibility to fracture.[1] The clinical significance of osteoporosis is bone fracture.

Common sites for osteoporotic fractures are Hip, Distal forearm, Spine and Proximal humerus. The remaining lifetime probability of a fracture in women at the menopause at any one of these sites is 40% or more in developed countries.[2] In the year 2000, there were estimated to be 620,000 new fractures at the hip, 574,000 at the forearm, 250,000 at the proximal humerus; and 620,000 spine fractures in men and women aged 50 years or over in Europe. These fractures accounted for 34.8% of such fractures worldwide[3].

Collectively, all osteoporotic fractures account for 2.7 million fractures in men and women in Europe at a direct cost of 36 billionEuros[4] Osteoporotic fractures are a major cause of morbidity in the population. It is widely recognized that osteoporosis and the consequent fractures are associated with increased mortality.

Assessment of fracture risk

The following are clinical risk factors used for the assessment of fracture probability

1. Advancing age
2. Sex- female
3. Low body mass index
4. Previous fragility fracture, particularly of the hip, wrist and spine
5. Glucocorticoid treatment (Less than 5 mg prednisolone daily for 3 months or more)
6. Smoking
7. Alcohol intake 3 or more units daily
8. Secondary cause of osteoporosis
9. Untreated hypogonadism in women e.g. premature menopause, bilateral oophorectomy
10. Prolonged immobility

Investigation of patients with osteoporosis

Bone mineral measurements and diagnosis of osteoporosis

The objectives of bone mineral measurements are to provide diagnostic criteria, prognostic information on the probability of future fractures. Bone measured density (BMD) is the amount of bone mass per unit volume (volumetric density), or per unit area (areal density). Dual-energy X-ray absorptiometry

(DXA) is the most widely used bone densitometric technique.

It is versatile in the sense that it can be used to assess bone mineral content of the whole skeleton as well as of specific sites, including those most vulnerable to fracture [7]

Diagnostic thresholds

The following four general descriptive categories are given below for adult men and women using measurements of DXA at the femoral neck[8]

1. Normal: a value for BMD that is higher than 1 standard deviation below the young adult female reference mean (T-score greater than or equal to −1 SD).
2. Low bone mass (osteopenia): a value for BMD more than 1 standard deviation below the young female adult mean, but less than 2.5 SD below this value (T-score >−1 and <−2.5 SD).
3. Osteoporosis: a value for BMD 2.5 SD or more below the young female adult mean (T-score more than or equal to −2.5 SD).
4. Severe osteoporosis (established osteoporosis): a value for BMD 2.5 SD or more below the young female adult mean in the presence of 1 or more fragility fractures.

Other techniques to measure bone mineral

1. Quantitative ultrasound (QUS)

a Broad band ultrasound attenuation (BUA)

b. Speed of sound (SOS)

2. Quantitative computed tomography (QCT).

General management

Encourage mobility

Immobilization is a very important cause of bone loss. Immobilized patients may lose as much bone in a week when confined to bed as they would otherwise lose in a year. For this reason immobility should, wherever possible be avoided. Exercise forms an integral component of management.[9] But the amount of weight-bearing exercise that is optimal for skeletal health in patients with osteoporosis is not known, Walking is safest & easiest, but does not have an impact on bone density.

Nutrition

There is a high prevalence of calcium, protein and vitamin D insufficiency in the elderly. Intakes of at least 1,000 mg/day of calcium, 800 IU of vitamin D and of 1 g/kg body weight of protein can be recommended in the general management of patients with osteoporosis.[10]

Major pharmacological interventions

The most commonly used agents in Europe are raloxifene, the bisphosphonates alendronate, ibandronate and risedronate. Until recently, hormone replacement treatment is also widely used.

Selective oestrogen-receptor modulators

Selective oestrogen-receptor modulators (SERMs) are non-steroidal agents that bind to the oestrogen receptor and act as oestrogen agonists or antagonists, depending on the target tissue. Raloxifene is the only SERM available for the prevention and treatment of postmenopausal osteoporosisIt prevents bone loss.[11]

Limitation

1. There was no significant reduction of non-vertebral fractures.

2. The only severe (but rare) adverse event was an increase in deep venous thromboembolism.

3. The overall risk benefit ratio of Raloxifene is favourable & the drug is approved widely for the prevention & treatment of postmenopausal osteoporosis

Bisphosphonates

Bisphosphonates are stable analogues of pyrophosphate They are potent inhibitors of bone resorption and produce their effect by reducing the recruitment and activity of osteoclasts and increasing their apoptosis. Alendronate 70 mg once weekly and risedronate 35 mg once weekly are the most commonly used bisphosphonates worldwide. It reduces the incidence of vertebral, wrist and hip fractures by approximately half in women with prevalent vertebral fractures.[12] The overall safety profile of Bisphosphonates is favourable. Oral bisphosphonates are associated with mild gastrointestinal disturbances, and rarely cause oesophagitis.

Other pharmacological interventions

Hormone replacement therapy (HRT)

Oestrogens reduce the accelerated bone turnover induced by the menopause, and prevent bone loss at all skeletal sites &

decrease the risk of vertebral and non-vertebral fractures. The combined use of conjugated oestrogen and medroxy progesterone acetate was associated with a 30% increased risk of coronary heart disease (CHD) and breast cancer, and with a 40% increase in stroke.[13,14] Thus, HRT is no longer recommended as a first-line treatment for the prevention and treatment of osteoporosis.

Calcitonin

Calcitonin is an endogenous polypeptide hormone that inhibits osteoclastic bone resorption.[1,2] For clinical use it can be administered either by injection or nasal application.[15] It likely reduces the risk of vertebral fracture. The drawbacks of repeated injections and the high costs of the nasal formulation preclude the long-term use of calcitonin as a first-line treatment of osteoporosis.

Peptides of the parathyroid hormone (PTH) family

Intermittent administration of PTH (e.g. with daily subcutaneous injections) results in an increase in the number and activity of osteoblasts, leading to an increase in bone mass and in an improvement in skeletal architecture at both cancellous and cortical skeletal sites. The recommended doses are 20 μg of teriparatide daily as subcutaneous injection. The most common reported adverse events in patients treated with teriparatide are nausea, pain in the limbs, headache and dizziness.

Strontium ranelate

Strontium ranelate is a recently registered agent that is marked for the treatment of postmenopausal osteoporosis, to reduce the risk of vertebral and hip fractures. Strontium ranelate both inhibit bone resorption & stimulates bone formation. The recommended daily dose is one 2-g sachet once daily by mouth.

Monitoring of treatment with densitometry

The goal of drug therapy in a patient with osteoporosis is to significantly increase bone strength, in order to decrease the risk of fracture. Alendronate was attributed to an increase in BMD at the lumbar spine and hip and causes 16% of vertebral fracture risk reduction.[16] Raloxifene causes 4% of the vertebral fracture risk reduction.

Monitoring of treatment with biochemical markers of bone turnover

Several markers have been developed over the past 20 years that reflect the overall rate of

bone formation and/or bone resorption. The most informative ones for the investigation of osteoporosis are osteocalcin and procollagen I N-terminal extension peptide (P1NP) for assessing bone formation, and type I collagen – and C-telopeptide breakdown products to assess bone resorption.[15] Antiresorptive therapies such as calcitonin, estrogen, SERMs and bisphosphonates induce a significant decrease in bone markers that return to the premenopausal range within 3–6 months for the resorption markers and within 6–9months for markers of formation.

Conclusion

From the above discussion, a platform is provided on which specific guidelines can be developed for national use.

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Case Report

Multiple Brain Abscess in a Young Boy with Acyanotic Tetralogy of Fallot: A Case Report

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Abstract

Tetralogy of Fallot is the most common congenital cyanotic heart defect during infancy. It is composed of a ventricular septal defect, an overriding aorta, obstruction of right ventricular outflow, and right ventricular hypertrophy. Most patients experience cyanosis at birth and die in childhood without surgical intervention. Patients with congenital cyanotic heart disease (with a right-to-left shunt) are at risk for developing a brain abscess. A 10 years old boy with previously diagnosaed as acyanotic Tetralogy of Fallot was presented with headache and irregular fever for 2 months in Shaheed Ziaur Rahman Medical College Hospital, Bogra, Bangladesh. Ultimately the cause of headache and irregular fever were multiple brain abscesses revealed in CT scan. In most series of patients from developed countries, cyanotic heart disease is the most commonly identified risk factor for development of brain abscess in immunocompetent patients. Cyanosis may be absent if right ventricular out flow obstruction is mild.

Keywords: *Brain Abscess, TOF*.

NBMC J 2015; 1 (1): 44-47

Introduction

Tetralogy of Fallot (TOF), was first described in 1888 by the French physician Etienne-Louis Arthur Fallot, is one of the most common types of cyanotic congenital heart defects, with an estimated incidence of 5% in patients with congenital heart disease.[1-4]

The original anatomic description of TOF included tetra-malformations, namely, ventricular septal defect (VSD), right ventricular outflow tract obstruction (RVOTO), aorta overriding the ventricular septum and RV hypertrophy (RVH).

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TOF is the most common cyanotic heart defect seen in child en beyond infancy. The VSD in TOF is a perimembranous defect with extension into the subpulmonary region. Additional muscular VSDs may be present. The right ventricular (RV) outflow tract obstruction (RVOTO) is most frequently found in the form of infundibular stenosis (45%) and rarely only at the level of the pulmonary valve (10%).[5-8]

Case report

Selim, a 10 years old young boy from Sirajgonj, a known case of TOF for 2 years admitted through emergency department of Shaheed Ziaur Rahman Medical College Hospital, Bogra. He had headache and irregular fever for last 2 months which became continued for last 10 days. He was obtunded for last 10 days and became unconscious and nonresponsive for last 2 days. Physical examination revealed growth retarded febrile and acyanotic patient with grade I clubbing, pulse 68/min, BP 110/80. No oedema was present. History of cyanotic spell, squatting was absent. Hb 11.0 gm/dl, ESR 45 mm, TC-WBC 15000 with 90% neutrophils. There was left parasternal heave, early ejection systolic murmur along left sternal edge at 3 and 4 intercostal spaces; and soft single S_2 without any obvious murmur or thrill at pulmonary area. Plantar reflex was extensor. X-ray chest revealed oligaemic lung fields with less prominent pulmonary artery and acute cardiophrenic angle suggestive of pulmonary stenosis and RVH respectively.

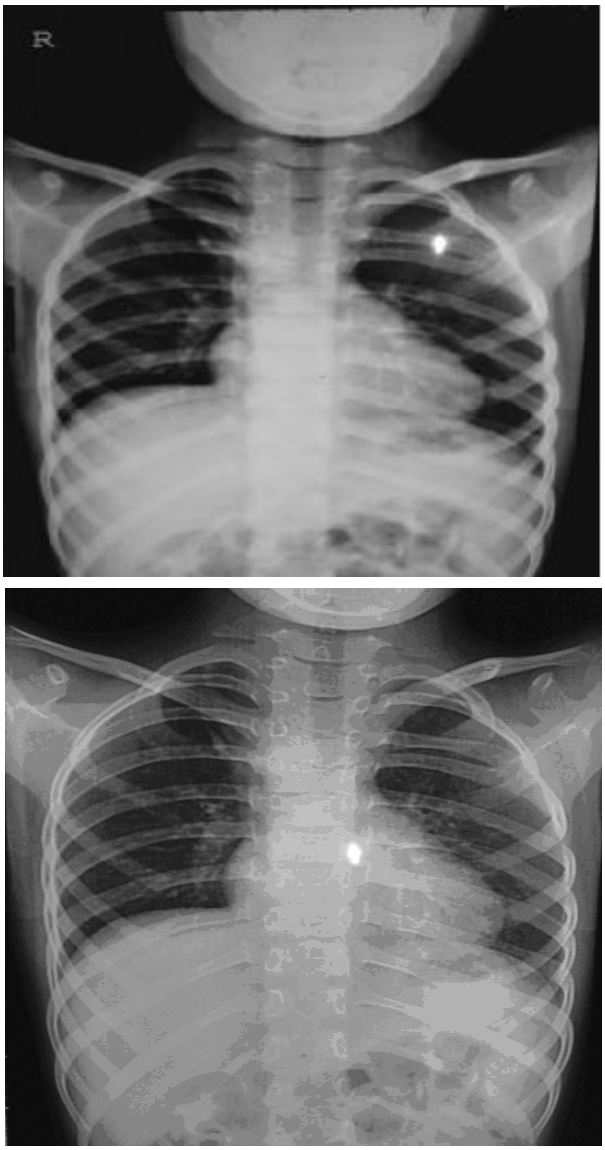


Figure: 1 (a, b): X-ray chest P/A View: Borderline cardiomegaly, acute cardiophrenic angle, concave pulmonary bay and mild oligaemia.

Echo cardiography showed Perimembranous interventricular septal defect (6mm), normal aorta with overriding of about 40%, pulmonary stenosis with narrow pulmonary artery and intact Interatrial septum.

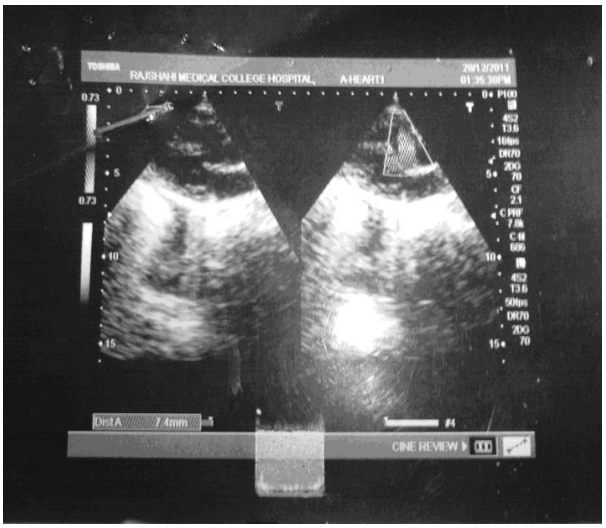
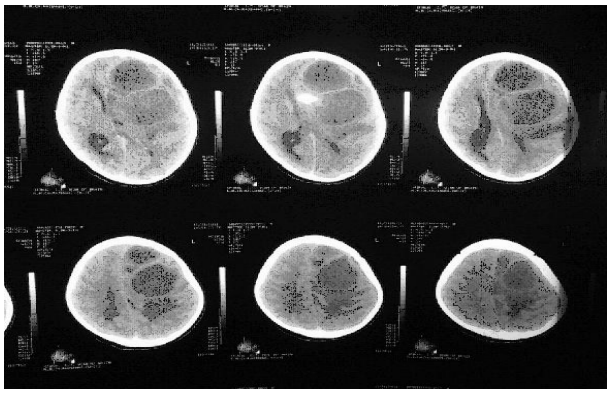


Figure-2: M-Mode & 2D echo.

CT Scan of brain revealed two hypodense area of about 53×45 mm and 45×35 mm in left temporo-parietal and left frontal region respectively having marked perifocal oedema. Left lateral ventricle was effaced.Midline shift was noted towards right. Left sided brain abscess with mass effect was diagnosed.



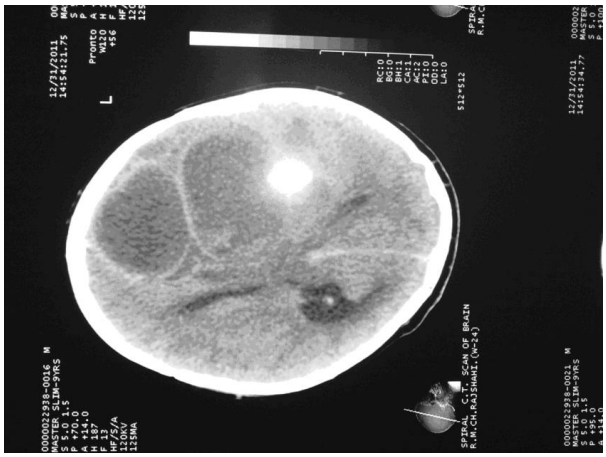


Figure-3 (a, b): CT scan of brain shows two abscess on left side with perifocaloedema and midline shift.

Patient was treated initially with impirical parenteral Ceftriaxone, Flucloxacillin, Metronidazole. Burr-hole operation was done under local anaesthesia as he was not fit for G/A due to low O_2 saturation. Aspiration of abscess was done on two occasions. Pus was sent for culture. Patient became afebrile on 4th post operative day and consciousness was improved. Inj. Amikacin was added after culture yielded Staphylococcus aureus. Patient was discharged fully conscious with oral cefuroxime, flucloxacin; and metronidazole.

Discussion

TOF is a leading cause of cyanotic congenital heart disease and forms about 10% of total congenital heart diseases and constitutes 13-

70% of all brain abscess.[1] In present case the patient had Perimembranous interventricular septal defect, normal aorta with overriding of about, pulmonary stenosis with narrow pulmonary artery; and intact Interatrial septum. These findings were consistent with the echo findings of previous studies.[3, 4, 5] Present case had no cyanosis although TOF is a cyanotic congenital heart disease. The incidence of brain abscess in patients with cyanotic heart disease has been reported to range between 5 and 18.7 %.[3, 4] Most brain abscesses are single, but 10-27% are multiple and may involve more than one lobe.[3] In current case the patient had multiple abscesses involving the left cerebral hemisphere. Previous studies revealed the organisms for brain abscess were Streptococcus milleri, Staphylococcus, other Streptococcus spp; and Haemophilus.[5] Studies in Malaysia [6,7] and Srilanka[8] found Streptococcus milleri as commonest organism. In our case the organism was Staphylococcus aureus. Howvere, multiple organisms had also been isolated in some patients.[4]

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Case Report

Sever Disease – A Case Report

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Abstract

A 10 year old male patient reported to orthopaedic out patient department (OPD) of North Bengal Medical College Hospital, Siraganj with the complaints of pain in left heel at the posterior aspect that was made worse by sports, especially those involving jumping. The onset was usually gradual. Often, the pain had been relieved somewhat with rest. He had history of fall from height and trauma to left heel. Then his parents were advised to do X ray both ankles lateral views. X ray report revealed dense left calcaneal apophysis with a lucent area within. Right calcaneal apophysis appeared normal. Rest of the bones and joint spaces of both ankles were unremarkable. Considering his history and x-ray findings he was diagnosed as a case of left sided calcaneal apophysitis or Sever Disease. Further x ray of left ankle two weeks later revealed denser calcaneal apophysis than the previous which confirmed diagnoses of calcaneal apophysistis or Sever disease.

Key words: *Calcaneal apophysitis, Sever Disease.* NBMC J 2015; 1 (1): 48-53

Introduction

Sever disease, first described in 1912, is a painful inflammation of the calcaneal apophysis. It is classified with the child and adolescent nonarticular osteochondroses. The calcaneal apophysis develops as an independent center of ossification (possibly multiple). It appears in boys aged 9-10 years and fuses by age 17 years; it appears in girls at slightly younger ages. During the rapid growth surrounding puberty, the apophyseal line appears to be weakened further because of increased fragile calcified cartilage.[1-3] Microfractures are believed to occur because of shear stress leading to the normal progression of fracture healing.

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This theory explains the clinical picture and the radiographic appearance of resorption, fragmentation; and increased sclerosis leading to eventual union (Figure 4). The radiographs showing fragmentation of the apophysis are not diagnostic, because multiple centers of ossification may exist in the normal apophysis, as noted. However, the degree of involvement in children displaying the clinical symptoms of Sever disease appears to be more pronounced.[3] Although no exact figures on the occurrence of Sever disease are available, this condition is a relatively common problem in growing active children.[4] Although no well-recognized, long-term sequelae of untreated Sever disease exist, this condition causes pain that can limit performance and participation in sports and if left untreated, can significantly limit even simple activities of daily life.[5-6] The incidence of Sever disease is higher in boys than in girls. In a report by Micheli and Ireland, 64% of the 85 patients were male. Sever disease occurs most frequently in active 10- to 12-year-old boys. In Micheli and Ireland's report on 85 patients, the average age of presentation was 11 years 10 months for boys and 8 years 8 months for girls.[7] Physical examinations vary depending on the severity and length of involvement. Bilateral involvement is present in approximately 60% of cases. Most patients experience pain with deep palpation at the Achilles insertion and pain when performing active toe raises. Forced dorsiflexion of the ankle also proves uncomfortable and is relieved with passive equinus positioning. Swelling may be present but usually is mild. In long-standing cases, the child may have calcaneal enlargement.[5,7] Differential Diagnoses are Achilles Tendon Pathology, Calcaneus Fractures, Osteomyelitis and Tarsal Coalition.[6-8]

Radiographic findings include increased sclerosis and fragmentation of the calcaneal apophysis. However, it should be stressed that these findings are nonspecific and also are observed in asymptomatic feet. Radiographic evaluation is beneficial for excluding fracture or rare tumor. It is vital to remember that radiographic changes on plain x-ray films are neither diagnostic nor prognostic; their primary value in this setting is for exclusion of other causes of heel pain. This point should be clearly explained to patients and parents.[8-9] It must be kept in mind that if pain continues, becomes significant at rest, awakens the patient from sleep, or is associated with significant swelling, tests should be performed to look for other causes. Tarsal coalition is another hindfoot disorder that must be distinguished from Sever disease. Thus, if

reduction of subtalar motion is found on physical examination, computed tomography (CT) can be helpful in differentiating this disease from failure of the bones of the hindfoot to separate.[7,9]

Although no well-recognized, long-term sequelae of untreated Sever disease exist, the physician's role is to minimize pain and allow the child to return to normal activities as soon as possible to enhance psychosocial development. The physician also must be able to differentiate Sever disease from other causes of heel pain in the child that are potentially more serious, such as tumor or osteomyelitis.[3, 4] Treatment is initially focused on reducing the present pain and limitations and then on preventing recurrence. Limitation of activity (especially running and jumping) usually is necessary. In Micheli and Ireland's study, 84% of 85 patients were able to resume sports activities after 2 months.[1, 5, 7-9] If the symptoms are not severe enough to warrant limiting sports activities or if the patient and parents are unwilling to miss a critical portion of the sport season, wearing a half-inch inner-shoe heel lift (at all times during ambulation), a monitored stretching program, presport and postsport icing, and judicious use of anti-inflammatory agents normally reduce the symptoms and allow continued participation. If symptoms worsen, activity modification must be included. For severe cases, short-term (2-3 weeks) cast treatment in mild equinus can be used.[5, 8, 9] To prevent recurrence, patients, parents, coaches; and trainers should be instructed regarding a good pre-exercise stretching program for the child. Early in the season, encouragement should be given for a preseason conditioning and stretching program. Coaches and trainers should be educated about recognition of the clinical symptoms so they are able to initiate early protective measures and seek medical referral when necessary. Limitation of activity (especially running and jumping) usually is necessary. Failure to instruct players, parents, coaches and trainers regarding limitation of activity and proper preexercise and postexercise stretching can lead to prolonged symptoms and further limitation of performance.[2, 4, 5, 6]

Case report

A 10 year old male patient hailing from Sirajganj Sadar, Sirajganj District reported to orthopaedic OPD of North Bengal Medical College Hospital, Siraganj with the complaints of pain in left heel. This pain was made worse by sports, especially those involving jumping. The onset was usually

gradual. Often, the pain had been relieved by rest. He had history of fall from height and trauma to left heel one week earlier. On physical examination, patient experienced pain with deep palpation at the Achilles insertion and also when performing active toe raised. Disconfort was felt on forced dorsiflexion of the ankle and was relieved with passive equinus positioning. No swelling was present at time of examination.

Then his parents were advised to do X ray both ankles lateral views. X ray report (Figure 1) revealed dense left calcaneal apophysis with a lucent area within. Right calcaneal apophysis appeared normal. Rest of the bones and joint spaces of both ankles were unremarkable.

Considering his history, clinical examination and x-ray findings he was diagnosed as a case of left sided calcaneal apophysitis or Sever Disease. Further x ray (Figure 2) of left ankle two weeks later revealed denser calcaneal apophysis than the previous which confirmed diagnoses of calcaneal apophysistis or Sever disease.

Figure 1: X ray of Both ankles both lateral views showing dense left calcaneal apophysis with a lucent area within. Right calcaneal apophysis appears normal. Rest of the bones and joint spaces of both ankles were unremarkable.

Figure 2: X ray of left ankle lateral view two weeks later showing denser calcaneal apophysis compared to previous one.

Figure 3: Sever disease. Lateral radiograph of foot in symptomatic 9-year-old male soccer player. Sclerosis is not diagnostic of Sever disease but is a characteristic radiographic finding[7].

Figure 4: Labeled MRI depicts the anatomy and mechanical forces responsible for the development of Sever disease (shear stress at the calcaneal apophysis)[9].

Discussion

Previous study revealed incidence of Sever disease is higher in boys than in girls. Sever disease occurs most frequently in active 10- to 12-year-old boys.[7] In our present case, the patients was a 10 years old boy. Present case had history of fall from height and trauma to left heel one week earlier. On physical examination the patient experienced pain with deep palpation at the Achilles insertion and also when performing active toe raised. Disconfort was felt on forced dorsiflexion of the ankle and was relieved with passive equinus positioning. No swelling was present at time of examination. Previous tudies revealed that most patients with Sever disease experienced pain with deep palpation at the Achilles insertion and pain when performing active toe raises. Forced dorsiflexion of the ankle also proved uncomfortable and is relieved with passive equinus positioning. Swelling might be present but usually is mild. In long-standing cases, the child might have calcaneal enlargement.[5,7] Comparable studies showed radiographic findings included increased sclerosis and fragmentation of the calcaneal apophysis (Figure 3) in Sever disease. However, it should be stressed that these findings are nonspecific and also are observed in asymptomatic feet.[7] Radiographic

evaluation was beneficial for excluding fracture or rare tumor. It is vital to remember that radiographic changes on plain x-ray films are neither diagnostic nor prognostic; their primary value in this setting is for exclusion of other causes of heel pain. [8-9] Our present study revealed same radiographic findings of dense left calcaneal apophysis with a lucent area within.

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