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The manuscripts submitted in this journal should not have been published in any other journal before. All submitted papers are subjected to be reviewed by the board of reviewers and editorial panel before accepting any manuscripts. The unaccepted articles will not be sent back, but will be destroyed. Proof corrections by the authors are well appreciated.

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The manuscript should be prepared using MS-Word. The whole manuscript should not exceed 4000 words. The manuscript should be divided into: (title page, abstract, body/text, references), but should be submitted as one document. All parts of the manuscript should be typed or printed on only one side of the paper in double space with wide margins of at least 2.54 cm in all sides of the manuscript throughout.

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The body of the manuscript/text should be divided into the following sections: i) Introduction, ii) Materials and Methods, iii) Results (include tables and diagrams), iv) Discussion, v) Conclusion, and vi) Acknowledgement if any (particularly on funding, study subjects and co-author).

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It includes a short yet robust background purpose and the rationale for the study (or summarized observation), including pertinent references, but data or conclusion from any work should not to be included.

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(i) Reference from the Journals

1. Parkin DM, Clayton D, Blook RJ, Massyer E, Fried HP, Iranov E et al. Childhood leukaemia in Europe after Chernobyl: 5 years follow up. Br J Cance 1996; 73: 1006-1012
2. Paganini HA, Chao A, Ross RK, Henderson Aspirin use and chronic diseases: a cohort st of the elderly. BMJ 1989; 299: 1247-1250

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(ii) Books

1. Gyton AC, Hall JE The thyroid metabolic hormones In Textbook of Medical Physiology. 10th edn. NewTork: WB Saunders Company. 2000: 858-86

(iii) Internet

I. Harverd medical school Available https:// en.wikipedia. org/wiki/havard medical college, accessed October 2011

(iv) Thesis/Dissertations

1. Khan MAH. Lipid profile and renal function status of hypothyroid patients [MD Thesis). Dhaka Bangabandhu Skeikh Mujib Medical University:2005

(v) Scientific or technical report

1. Akutsu T. Total heart replacement device. Bethesda MD: National Institutes of Health, National Heart and Lung Institute, 1974 Apr report No. N1H-NHLI-69 2185-4 Ethical approval

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- study concept
- study design
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Editorial

Physicians in Bangladesh: Is the problem with number or distribution?

Muhammod Abdus Sabur

For any health system, human resources for health (HRH), also known as health workforce (HWF) are the most critical driving force. Health care is a labour intensive service industry. The human resources are the personification of the system's core values. It heals and cares for people, eases pain and suffering, prevents disease and mitigates risk. It is the human link that connects health knowledge to health action. The human resources are at the heart of each and every health system. It is central to advancing health. They are the ultimate resource for promoting health, preventing disease and curing sickness. Money, drugs, equipment, infrastructures are needed but they demand a motivated, skilled and supported human resources. People, not just vaccines and drugs prevent disease and cure illness. Human resources are active, not passive agents of health change. Human resources spearhead and glue together the health system (BHW 2008). In health systems, human resources function as gatekeepers for, and navigators of, the effective, or wasteful, application of all other resources, such as drugs, vaccines and supplies (WHO 2006). HWF is the target 3.c of the Sustainable Development Goal (SDG) – substantially increase the recruitment, development, training and retention of the health workforce in developing countries.

The World Health Organization (WHO) has identified the index of 4.45 physicians, nurses and midwives and others cadres (refers to the seven other broad categories of the health workforce as defined by the WHO Global Health Workforce Statistics Database, i.e. dentistry, pharmacy, laboratory, environment and public health, community and traditional health, health management and support, and all other health workforce categories) per 1,000 population to estimate the health human resources need and need-based shortage by 2030 (WHO 2016). WHO has also recommended ratio of physicians: nurses and midwives: others cadres as 1:3:5 (WHO 2015). These mean 0.5 physician, 1.5 nurses and midwives and 2.45 other HRH are required for every 1,000 population. Among the HRH, physicians are important as they often lead the team.

Bangladesh has 165,158,616 population (BBS 2022). So the country needs 82,579 physicians. Estimated number of MBBS doctor available in the country 101,559 (MOHFW 2023). In 116 medical colleges (39 government and 77 non-government), 11,328 seats (4,500 government and 6,828) are available for yearly admission in MBBS course (MOHFW 2023). Clearly Bangladesh has achieved WHO recommended population physician ratio and with the annual production capacity for MBBS, the situation is not going to change negatively in near future.

However, like many developing countries, Bangladesh also suffers from mal-distribution of available physicians. Thus many perceive that the country has shortage of physicians, whereas the problem is with the distribution. The heavy urban bias in the health workforce has been a persistent issue in Bangladesh for decades (Ahmed, Hossain et al. 2011). Most qualified personnel concentrate in major cities—disproportionately in Dhaka City, since almost all specialized and teaching hospitals are in Dhaka City —while hard-to-reach areas are left with unqualified or semi-qualified personnel. Of the national population, 15 percent (in Dhaka, Chattogram, Rajshahi, and Khulna) are served by 35 percent of physicians. Fewer than 20 percent of the HRH are providing services to more than 75 percent of the rural population (El-Saharty et al. 2015). The doctor-to-population ratio is 1:1,500 in urban areas and 10 times worse in rural areas—1:15,000 (Mabud 2005). The urban–rural mal-distribution has existed in

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Bangladesh for decades, and successive governments have not been entirely successful in resolving this challenge. For example, the focus to establish health complexes at rural upazila level and offer minimal health services as close to the community as resources permitted. Efforts were made by successive governments to ensure availability of qualified HRH in these areas on a regular basis, but these efforts proved unsuccessful. The translation of policies into practice has always been hindered by political interference in areas such as establishing medical colleges outside the major cities, compulsory service in rural areas, or structuring a career ladder (Joarder, Uddin, and Islam 2013). Rigid civil service rules and weak implementation capacity have been factors that hinder progress toward improving the distribution of physicians.

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Original Article

Depression and Associated Factors among Women having Primary Infertility

Afsara Tasnim Keya[1], Muhammad Kamrul Amin[2], Md. Nahid Noor Tusar[3], Nazia Binte Islam[4], Fatema Ershad[5], Nusrat Jahan[6], Tamanna Akter[7], Sumaiya Salam[8]

Abstract

Background: Depression is significantly higher in infertile women especially among women having primary infertility. The purpose of the study was to determine the level of depression and associated factors related to depression among women having primary infertility.

Materials and Methods: This cross-sectional study was conducted from January to December 2022 with 165 women having primary infertility who were enrolled by convenience sampling technique from Dhaka Medical College and Hospital. A semi-structured questionnaire and checklist were used for data collection through face-to-face interview and reviewing medical records respectively. Data were analyzed by statistical software. Quality control and all ethical issues were strictly maintained in the study.

Results: The mean age of women having primary infertility was 29.45 (±5.302) years. Out of 165 respondents, 160 (97%) showed depression. The majority 84(50.9%) had mild to moderate level of depression, while 49(29.7%) had moderate to severe depression. The mean duration of marriage was 8.48 (±4.78) years and the mean duration of getting treatment for infertility 2.33(±2.193) years. Among all, 113(68.5%) were trying to conceive for last 2-7 years and 59(35.75%) of the respondents had showed depression who faced negligence of husband for primary infertility and was statistically significant ($p<0.05$). Besides, 116(70.30%) participants had showed depression who had taken ovulation induction drugs for treatment purpose and it was statistically significant ($p<0.05$). In addition, 101(61.27%) participants showed depression to bear expenses for infertility treatment and was statistically significance($p<0.023$).

Conclusion: Depression was strongly associated with factors related to primary infertility like negligence of husband, taking ovulation inducing drugs, difficulties to bear expenses for infertility treatment. Specific interventions should be taken to prevent depression and at the same time government should conduct campaign to create awareness about primary infertility and depression.

Keywords: Depression, Associated Factors, Primary Infertility

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Introduction

Infertility is a disease of the male or female reproductive system defined by the failure to achieve a pregnancy after 12 months or more of regular unprotected sexual intercourse[1]. Infertility has been classified into either primary infertility or secondary infertility. Primary infertility refers to couples who have not become pregnant after at least 1 year having sex without using any birth control methods. Secondary infertility refers to couples who have been able to get pregnant at least once, but now are unable[2]. Being one of the main problems in reproductive health, infertility is a matter of serious concern for the World Health Organization (WHO) [1]. The relationship between depression and infertility is a two-way street. Research shows that infertility can lead to depression. And there's some evidence to suggest that depression may influence fertility[3].

A cross-sectional study was conducted during April–July 2016 at Tu Du Hospital and that study was provided useful insight of correlates of depressive symptoms among Vietnamese infertile women[4]. Reproductive health strategy of Bangladesh is overlooking the problem of infertility; instead, the focus has always been on overpopulation issue. There is evidence that potential causal factors of infertility are also widely present in Bangladesh[5]. Infertile people had a higher prevalence of depression than fertile people[6,7].

By studying various literature of different countries, there is knowledge gap was found in between depression and other factors related to depression among women who are solely suffering from primary infertility. So, the purpose of this study was to identify the level of depression and associated factors related to depression among women having primary infertility attending in In vitro fertilization (IVF) center of Dhaka Medical College Hospital (DMCH).

Materials and Methods

This cross sectional observational study was carried out in the In vitro fertilization (IVF) center of Dhaka Medical College Hospital, Dhaka, Bangladesh from January 2022 to December 2022. Total 165 samples were included in this study who were suffered from primary infertility and fulfilled the selection criteria. The place was selected purposively and convenience sampling technique was used. A semi-structured questionnaire and a checklist were used for the collection of data from the respondents by face to face interview. The questionnaire was based on **Goldberg Depression Questionnaire (GDQ)** scale[8]. Data were processed and analyzed by computer software SPSS (Statistical Package for Social Sciences), version 26.

Findings related to socio-demographic characteristics

Table-1 showed that in respect of age of the respondents, majority 84(50.9%) of the respondents were in the age group of 18-29 years; mean age ± SD was 29.45 years ± 5.302. In respect of age of the husband of the respondents, majority 141 (85.5%) were in the age group of 30-59 years and mean ± SD was 35.13 ± 6.036.

Most of them 108(65.5%) lived in the urban area and majority were Muslim 156(94.5%). Regarding level of education, majority 87(52.7%) belonged to the Primary to SSC level and 16(9.7%) were illiterate. Most of them 101(61.2%) were housewives and 125 (75.8%) were belonged to nuclear family.

Regarding monthly family income, out of 165 women, most of them 96(58.2%) had monthly family income 11000-20000 taka, 42(25.5%) had monthly income 21000-40000 taka, 14(8.5%) had monthly income 41000-80000 taka and 13(7.9%) had monthly income 50000-10000 taka and the mean was 22448.48 (Table-1).

Table-I : Sociodemographic characteristics of the respondents (n=165)

Attributes	Frequency	Percentage
Age of the respondents (in complete years)		
18-29	84	50.9
30-39	77	46.7
40-49	04	2.4
Age of the husband of the respondents (in complete years)		
21-29	23	13.9
30-59	141	85.5
60-65	1	0.6
Residential status		
Urban	108	65.5
Rural	57	34.5
Religion		
Muslim	156	94.5
Sanatan	09	5.5
Level of education		
Iliterate	16	9.7
Primary to SSC	87	52.7
Higher Secondary&above	62	37.6
Occupation		
Housewife	101	61.2
Business / Service	20	12.1
Others	44	26.7
Family type		
Nuclear	125	75.8
Joint	40	24.2
Monthly familyincome (in Taka)		
5000-10000	13	7.9
11000-20000	96	58.2
21000-40000	42	25.5
41000-80000	14	8.5

Level of depression

Table-2: Distribution of the respondents according to level of depression (by using Goldberg Depression Scale):

Level of depression	Score	Frequency	Percentage
No depression	0-9	5	3.0
Possibly mildly depression	10-17	8	4.8
Borderline depression	18-21	11	6.7
Mild-Moderate depression	22-35	84	50.9
Moderate-Severe depression	36-53	49	29.7
Severely depression	54-90	8	4.8
Total		n=165	100

Table-2 showed that, according to GDQ scale, out of 165 respondents 5(3%) had no depression. Most of them, 84(50.9%) had mild to moderate depression, 49 (29.7%) had moderate to severe depression, Others 11(6.7%) had borderline depression, 8 (4.8 %) had severe depression and 8 (4.8 %) had possibly mild depression.

Associated factors related to primary infertility:

Table-3: Distribution of respondents by age at marriage and duration of trying to conceive:

Attributes (in years)	Group	Frequency	Percentage	Statistics
Age at marriage	11-20	64	38.3	Mean ±SD=20.73±4.115
	21-30	62	37.6	Minimum = 11
	31-40	39	23.6	Maximum = 35
	Total	165	100	
Duration of trying to conceive	2-7	113	68.5	Mean ±SD=6.52 ± 4.036
	8-13	40	24.2	Minimum = 2
	14-20	12	7.3	Maximum = 20
	Total	165	100	

Table -3 revealed that in respect of the age at marriage, majority were 64(38.3%) belonged to group 11-20 years and 113(68.5%) respondents were trying to conceive for 2-7 years.

Table-4: Ditribution of respondents by duration of marriage and duration of treatment for infertility:

Attributes (in years)	Group	Frequency	Percentage	Statistics
Duration of marriage	1-5	52	31.5	Mean ±SD=8.48±4.78
	6-10	72	43.6	Minimum = 2
	11-15	25	15.2	Maximum = 22
	16-25	16	9.7	
	Total	165	100	
Duration of treatment for infertility	1-2	116	70.3	Mean ±SD=2.33 ± 2.193
	3-5	40	24.2	Minimum = 1
	6-10	7	4.2	Maximum = 15
	11-15	2	1.2	
	Total	165	100	

In table-4 showed that distribution of respondents by duration of marriage and duration of treatment for infertility.

Table-5: Association between levels of depression with difficulty to bear expenses for infertility treatment:

Difficulty to bear expenses	Level of depression						Total f(%)	Significance
	No depression	Possibly mild depression f (%)	Borderline depression f(%)	Mild-moderate depression f (%)	Moderate-severe depression f (%)	Severe depression f (%)		
Yes	1(0.6)	3(1.8)	4(2.42)	52(31.51)	37(22.42)	4(2.42)	101(61.27)	x2= 12.991
No	4(2.42)	5(3.03)	7(4.24)	32(19.39)	12(7.27)	4(2.42)	64 (38.77)	df = 5
Total	5(3)	8(4.8)	11(6.7)	84(50.9)	49(29.7)	8(4.8)	165 (100)	p= 0.023

The study revealed that majorities had faced difficulty to bear expenses for infertility treatment and among them 52(31.51%) had suffered from mild to moderate depression. The rest of the association was shown in table-5. The association between level of depression and difficulty to bear expenses for infertility treatment was statistically significant (P = 0.023).

Table-6: Association between levels of depression with negligence of husband of the respondents:

Negligence of husband	Level of depression						Total f(%)	Significance
	No depression	Possibly mild depression f (%)	Borderline depression f(%)	Mild-moderate depression f (%)	Moderate-severe depression f (%)	Severe depression f (%)		
Yes	0(0)	0(0)	0(0)	24(14.54)	30(18.18)	5(3.03)	59 (35.8)	x2= 31.572
No	5(3.03)	8(4.84)	11(6.67)	60(36.36)	19(11.51)	3(1.81)	106 (64.2)	df = 5
Total	5(3)	8(4.8)	11(6.7)	84(50.9)	49(29.7)	8(4.8)	165 (100)	p= 0.000

In the table-6 showed that 59(35.8%) participants had suffered from negligence of the husbands and among them 30(18.18%) had showed moderate to severe depression. The association between level of depression and negligence of husband were statistically significant (P = 0.000).

Table-7: Association between level of depression and taking of ovulation inducing drugs of the respondents:

Taking of ovulation inducing drugs	Level of depression						Total f(%)	Significance
	No depression	Possibly mild depression f (%)	Borderline depression f(%)	Mild-moderate depression f (%)	Moderate-severe depression f (%)	Severe depression f (%)		
Yes	3(1.81)	4(2.42)	4(2.42)	58(35.1)	40(24.24)	7(4.2)	116 (70.3)	x2= 12.112
No	2(1.21)	4(2.42)	7(4.24)	26(15.75)	9(5.45)	1(0.6)	49 (29.7)	df =5
Total	5(3)	8(4.8)	11(6.7)	84(50.9)	49(29.7)	8(4.8)	165 (100)	p= 0.033

In table-7 the study revealed that majority 116(70.3%) had taken ovulation inducing drugs and among them 58(35.1%) had suffered from mild to moderate depression, 40(24.24%) had suffered from moderate to severe depression. The association between level of depression and taking of ovulation inducing drugs was statistically significant (P = 0.033).

Discussion

This cross-sectional study was carried out among 165 women having primary infertility at infertility unit (IVF

Centre), Dhaka Medical College Hospital, Dhaka. This study revealed that the mean age for the infertile women was 29.45 ± 5.302 years. Another cross sectional study was conducted in Bangladesh in 2017 among 112 infertile women, age range between 18-49 years and mean age was 28.5 ± 5.5[9] . In the present study, respondents were between the ages of 18-49 years. Majority (52.1%) of the participants were in the age group of 28-37 years. In this study there was no strong association with increasing age with depression and infertility. In contrast, another study showed infertile women are worst victim of psychological morbidities with increasing age[9].

Study discussed that the mean age for the husband of infertile women was 35.13 ± 6.036 years. Another cross sectional study was conducted in Bangladesh in 2018 among 112 infertile couples, age range of husband in between 29-38 years and mean age was 32.46 ± 4.16,[10] which was nearly similar with present study. In the present study, among the respondents, majority 156(94.5%) were Muslim, 9(5.5%) were Sanatan. This was due to most of the people in the country were Muslim[11].

In this study, 87(52.7%) had completed Secondary School, 62(37.6%) had completed higher secondary & above,16(9.7%) were illiterate. This was due to raising awareness about education. But there was no significant association with level of depression. Another cross sectional study among 120 infertile women in Morocco in 2017 revealed that 50(41.7%) completed primary school or less and 70(58.3%) studied higher school and over[12]. This may be due to education system and socio-economic differences.

This study, among 165 of primary infertile women, majority 101(61.2%) were homemaker, 44(26.7%) were included in others category and 20(12.1%) were included in business or service. In the other hand, Japanese researchers also showed that unemployed women had a greater tendency towards experiencing depression than did employed participants[13].

This study showed 125(75.8%) were belonged to nuclear family and 40(24.2%) were belonged to joint family. Among the nuclear family 86(52.0%) showed mild to moderate level of depression which is greater than joint family. Besides, 96(58.2%) respondents had monthly family income 11000-20000 taka, 42(25.5%) had in between 21000-40000 taka, 14(8.5%) had in between 41000-80000 taka and 13(7.9%) had in between 50000-10000 taka. This was due to the fact that most of the participants at DMCH were from middle and low socio-economic status. In the cross-sectional study in Morocco, among 120 infertile women 115(95.8%) had middle or low income and 5 (4.2%) higher income[12].

Finally, findings of the study showed that there was no significant correlation between age, education, occupation and monthly income with the severity of depression. This is in contrast with a study conducted on 238 Turkish women which revealed that poor income status and low education level were associated with higher rate of depression[14]. Also, the level of depression was found to be significantly higher among subjects with low or no formal education and among the unemployed infertile women in Ghana[15]. An Iranian study also showed that there is more depression among housewives than service holders which correlates with our study[16].

In this study according to GDQ scale, out of 165 respondents 5(3%) had no depression. The remaining 160 (97%) had depression. Another cross sectional descriptive study was carried out on 112 purposively selected infertile married women of Kurmitola General Hospital, Dhaka. The Goldberg Depression questionnaires (GDQ) and Beck Anxiety Inventory (BAI) were administered. The study showed 70 (62.5%) infertile women showed different levels of depression (GDQ scale). Of these, 12(10.7%) had mild to moderate and 36 (32.1%) had moderate to severe level of depression.[9] This was might be due to duration of this treatment.

This study revealed that mean duration of marriage was 8.48 ± 4.78 years and in 9-15 years of duration of marriage group, depression disorder was more prevalent. The study also showed that 116 (70.3%) were taking ovulation inducing drugs and among them 58(50%) suffered from mild to moderate depression, another cross sectional study conducted on Bangladesh in 2017 among of 112 infertile women showed 67.9% were taking ovulation inducing drugs and among them 43.8% had mild to moderate depression and that was not statistically significant ($p>0.05$)[9].

Infertility is a global health problem now-a-days[19.] Depression increases with duration of infertility[17]. Our findings reaffirm the necessity for gynecologists and other medical practitioners to monitor women receiving reproductive therapy for psychosocial distress. If professionally supervised psychological therapies are taken into account as a crucial component of the care of female infertility, the quality of life for women with fertility issues might be significantly enhanced[18].

One of the strong points of the present study was done in the most specialized government medical center in

Dhaka where treatment cost so minimum so that it had found many patients regarding infertility especially primary infertility. Besides, the nature of cross sectional study design limits the establishment of casual inferences with study variables that was an important limitation of this study.

Conclusion

Infertility cannot be treated as an individual problem; it has a wide range of social and health repercussions, one of the common psychological conditions linked to primary infertility is depression, which has a substantial impact on the lives of infertile couple specially in women as well as their care and follow up.

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Original Article

Prevalence of Overweight and Obesity among the School-Going Children (6-12 Years) of Urban and Rural Areas in Bangladesh

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Abstract

Introduction: Childhood obesity becomes an epidemic worldwide which is escalating as a major health burden in developed as well as in developing countries. The obesity in childhood appears to be an increased risk of subsequent metabolic, systemic and psycho-social morbidities. The transitions in the dietary habit and sedentary lifestyle are the major risk factors along with some genetic involvement. Prevalence survey is necessary to know about the present incidence and the trend to combat childhood overweight and obesity.

Objectives: Aim of this study is to assess overweight and obesity among urban and rural school-going children of 6-12 years old.

Materials & Methods: A prospective observational study was carried out from March 2013 to May 2014 by the Department of Pediatrics, Bangabandhu Sheikh Mujib Medical University, Dhaka and subjects were from two schools of rural and urban areas of Bangladesh. Total 365 children aged between 6-12 years were included. Weight and height of all available students were measured, BMI was calculated and nutritional status was measured by using CDC growth chart.

Results: Proportion of overweight and obesity among all selected students were 35 (9.6%) and 40 (11%) respectively. In Rural area 5 (2.6%) and 3 (1.5%) children were overweight and obese respectively whereas in Urban area, 30 (17.6%) and 37 (21.8%) children were overweight and obese respectively. The proportions were significantly higher than in rural area.

Conclusion: Overweight and obesity are in high proportion among urban school going children.

Keywords: Overweight; Obesity; Underweight; Urban; Rural; School-going children; BMI

Introduction

Globally, the prevalence of overweight and obesity in children has increased, and this has become a critical public health concern [1]. In countries experiencing rapid economic growth, particularly in developing nations, the increasing prevalence of youth overweight and obesity poses significant obstacles to healthcare systems [2,3]. Recent statistics show a worrying increase in developing nations as well, although it has traditionally been more common in developed nations [4].

Across the globe, the prevalence of childhood overweight and obesity is on the rise, albeit with considerable variation among nations [5, 6]. The International Obesity Task Force (IOTF) has reported a decade-long upward trajectory in obesity rates among children worldwide [7]. Developed regions such as North America and Western Europe have shown the highest rates of obesity, while middle- and low-income countries are experiencing significantly higher rates [8]. Highlighting this shift, a 2013 World Health Organization (WHO) report revealed that over 40 million children under five years old were overweight in 2011, with the majority residing in developing nations [9]. Additionally, another WHO report indicated that approximately 35 million of these overweight children lived in developing countries [10]. Consequently, obesity is no longer confined to

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affluent nations but is spreading swiftly in low- and middle-income countries [8,11].

The WHO has prioritized investigating the global health implications stemming from economic and nutritional transitions, particularly in developing nations experiencing economic growth and improved living standards [12]. This shift has seen a transition from under-nutrition to over-nutrition, evident in the rising trend of childhood overweight and obesity, often referred to as the 'Double Burden of Malnutrition' [13]. This phenomenon is now observable among school-aged children, with rural areas historically focused on under-nutrition now facing the dual challenge of over-nutrition as well [14,15].

The root causes of overweight and obesity primarily stem from energy imbalances, driven by factors such as excessive calorie intake, insufficient physical activity, high socioeconomic status, urbanization, cultural norms, and the marketing tactics of processed food companies [3,16,17] In Bangladesh, nearly 40% of children under five suffer from inadequate nutrition [18]. However, rapid urbanization, dwindling recreational spaces, increased disposable income, and widespread access to sedentary technology are contributing to a rise in childhood overweight and obesity, particularly among affluent families in urban areas like Dhaka [19]. The nation is presently encountering the two fold burden of malnutrition, with both under-nutrition and childhood overweight/obesity prevalent. Childhood overweight and obesity represent a significant public health concern in urban cities of Bangladesh because overweight or obese children have a higher risk of becoming overweight or obese adults [20,21]. Additionally, overweight adults face increased mortality and morbidity risks associated with obesity-related chronic diseases, further straining the already challenged well-being framework in Bangladesh [22,23].

Given the divergent demographic characteristics of urban and rural children in Bangladesh, it is imperative to assess the prevalence of childhood overweight and obesity in both settings to gain a comprehensive understanding of the national landscape regarding this public health concern.

Materials & Methods

This prospective observational study was conducted between March 2013 to May 2014, which were enrolled total 365 school going children (6-12 years) from two purposively selected schools in Bangladesh having co-education system; 195 students were collected from an English medium school in urban area of Dhaka city and 170 students were from a rural Bangla medium school in Faridpur district and analyzed in the department of Pediatrics, Bangabandhu Sheikh Mujib Medical University (BSMMU). All students of selected age groups of both schools who were present during the allocated period of study were included and children who were suffering from chronic illnesses e.g. genetic syndrome, endocrine disorder, eating disorders and those who were taking systemic steroid for long time for any reason, were excluded from the study. Height and weight of selected children were measured and BMI was calculated. Obtained BMI for age and sex was categorized into individual nutritional status by plotting on CDC BMI for age and sex percentile chart. BMI for age and sex, between ≥85th to <95th percentile was defined as overweight, ≥95th percentile was defined as obesity and <5th percentile was under weight.

Prior to the commencement of this study the research protocol was approved by the Institutional Review Board (IRB) of BSMMU; written informed consent was taken from school authorities and verbal consent was taken from students and/or guardians.

All data were demonstrated as mean ± SD or n (%) where appropriate. Proportion of overweight and obesity were presented as percentage. Z test and Student's t test were used for group comparison. All comparisons were made two-sided and a p-≤0.05 (2-tailed) considered as significant. Data were analyzed using SPSS version 16.

Results

A total of 365 students from two purposively selected schools were studied. Among them, 170 (46.6%) students were from urban area and 195 (53.4%) were from rural area. Among total students, boys were 198 (54.2%) and girls were 167 (45.8%) and boys-girls ratio was 1.2 : 1.

The studied students of both urban and rural schools were in different age groups ranging from 6 years to 12 years. Studied children were well distributed in all age groups with some preponderance in 11-12 year age group in both urban and rural students (Table 1).

Amongst all studied children, proportion of overweight and obesity was 35 (9.6%) and 40 (11%) respectively; whereas, proportion of underweight was 57 (15.6%) (Figure 1).

Table-1: Age Distribution of Studied Students According to Place of Residence

Age in years	Urban (n=170) n (%)	Rural (n=195) n (%)	Both urban & rural N = 365 (%)
6 - 7	21 (12.3)	30 (15.4)	51 (14)
7 - 8	26 (15.3)	24 (12.3)	50 (13.7)
8 - 9	32 (18.8)	11(5.6)	43 (11.8)
9 - 10	28 (16.5)	31 (15.9)	59 (16.2)
10 - 11	27 (15.9)	29 (14.9)	56 (15.3)
11 - 12	36 (21.2)	70 (35.9)	106 (29)
Total	170 (46.6)	195 (53.4)	365 (100)

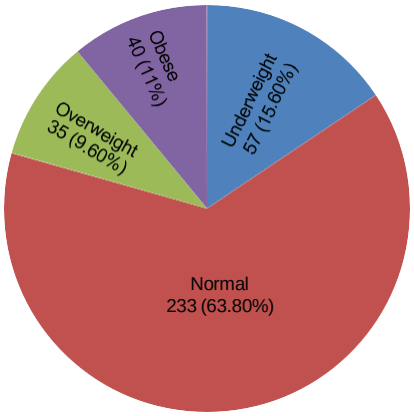

Figure-1: Nutritional status of students as per BMI for Age and Sex (N=365)

Table-3: Distribution of Nutritional Status (by BMI for Age and Sex) of Urban Students as per Age and Sex (n=170)

Age in years	Underweight (n = 13)		Normal (n = 90)		Overweight (n = 30)		Obese (n = 37)	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
6 - 7	1	1	6	3	4	1	4	1
7 - 8	2	2	3	4	1	3	5	6
8 - 9	3	0	8	9	2	1	7	2
9 - 10	3	0	9	7	1	1	4	3
10 - 11	0	0	2	12	4	6	3	0
11 - 12	1	0	16	11	1	5	1	1
Total	10	3	44	46	13	17	24	13

Table-4: Distribution of Nutritional Status (by BMI for Age and Sex) of Rural Students as per Age and Sex (n=195)

Age in years	Underweight (n = 44)		Normal (n = 143)		Overweight (n = 5)		Obese (n = 3)	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
6 - 7	5	2	11	11	0	1	0	0
7 - 8	4	3	12	5	0	0	0	0
8 - 9	3	3	5	0	0	0	0	0
9 - 10	3	2	12	11	1	0	0	2
10 - 11	2	2	14	9	0	1	1	0
11 - 12	6	9	27	26	1	1	0	0
Total	23	21	81	62	2	3	1	2

The numbers of overweight and obese students in different age group were almost similar in urban students (Table-3) as well as in rural studied students (Table-4)

Table-5: Comparison of Nutritional Status (by BMI for Age and Sex) between Urban and Rural Students

Nutritional Status	Urban (n = 170) n (%)		Rural (n = 195) n (%)		p value*
Underweight	13	(7.6)	44	(22.6)	0.001
Normal	90	(52.9)	143	(73.3)	0.001
Overweight	30	(17.6)	5	(2.6)	0.001
Obese	37	(21.8)	3	(1.5)	0.001

*Z test was done to measure the level of significance.

The corresponding proportion of overweight and obesity was 30 (17.6%) and 37 (21.8%)in urban children and 5 (2.6%) and 3 (1.5%) in rural children. This difference was statistically significant (p=0.001). Among urban studied children, proportion of obesity37 (21.8%) was very high than overweight 30 (17.6%). However, underweight was found in significantly higher proportion in rural studied children 44 (22.6%), compared to urban children 13 (7.6%).

Table-6: Comparison of Nutritional Status (by BMI for Age and Sex) between Boys and Girls

Nutritional Status	Boys (n = 198) n (%)		Girls (n = 167) n (%)		P value*
Underweight	33	(16.7)	24	(14.4)	0.549
Normal	125	(63.1)	108	(64.7)	0.749
Overweight	15	(7.6)	20	(12)	0.156
Obese	25	(12.6)	15	(9)	0.271

*Z test was done to measure the level of significance.

While nutritional status (as per BMI) of boys and girls of total studied children were compared, no significant difference was found **(Table-6).**

Table-7: Comparison of Nutritional Status (by BMI for Age and Sex) between Urban and Rural Boys

Nutritional Status	Urban boys (n = 91) n (%)		Rural boys (n=107) n (%)		p value*
Underweight	10	(11)	23	(21.5)	0.048
Normal	44	(48.3)	81	(75.7)	0.001
Overweight	13	(14.3)	2	(1.9)	0.001
Obese	24	(26.4)	1	(0.9)	0.001

*Z test was done to measure the level of significant.

However, proportions of overweight and obesity were more in urban boys 13 (14.3%) and 24 (26.4%) respectively than rural boys 2 (1.9%)and 1 (0.9%) respectively) which is statistically significant (p = 0.001 in obese) (Table-7). Among boys, proportion of underweight was found significantly higher in rural areas 23 (21.5%), compared to urban areas 10 (11%) (p = 0.048).

Table-8: Comparison of Nutritional Status (by BMI for Age and Sex) between Urban and Rural Girls

Nutritional Status	Urban girls (n = 79) n (%)		Rural girls (n = 88) n (%)		p value*
Underweight	3	(3.8)	21	(23.9)	0.001
Normal	46	(58.2)	62	(70.4)	0.099
Overweight	17	(21.5)	3	(3.4)	0.001
Obese	13	(16.5)	2	(2.3)	0.001

*Z test was done to measure the level of significant.

Similar dominance of proportion of overweight and obesity were found in urban girls 17 (21.5% overweight and 13 (16.5%) obese over rural girls (3 (3.4%) overweight and 2 (2.3%) obese) (p = 0.001). Among girls, proportion of underweight was found significantly higher in rural areas 21 (23.9%), compared to urban areas 3 (3.8%) and the difference was also significant between urban and rural girls (p=0.001). (Table-8)

Discussion

Childhood obesity is one of the most widespread medical problems with a rapidly increasing prevalence in both rural and urban areas of both developed and developing countries as well [3]. The BMI for age and sex is a widely used method to determine and classify overweight and obesity. Repeated prevalence study helps to understand present prevalence as well as trend of childhood overweight and obesity in the society. This may help in decision making in respect to establish alternative strategy. Current study is an exploratory study and has been conducted among children aged 6-12 years from two purposively selected schools of two socio-economic backgrounds. School children were selected as they are easy to collect and they are more vulnerable. Among 365 students of current study, 170 (46.6%) were from urban and 195 (53.4%) were from rural schools.

In present study, 30 (17.6%) children were estimated as overweight and 37 (21.8%) were obese in urban area. The proportion of overweight and obesity was found very high, as urban group of studied children were selected from an English-medium school of Dhaka city, where students were from affluent society. A total of 67 (39.4%) children of urban school were either obese or overweight, which is almost similar to another study conducted in same city in 2006, where estimated proportion of either obese or overweight children was 41.5%[24]. Proportion of obesity (17.6%). This may suggest that a true population shift in weight distribution has occurred. Intervention programs must therefore aim to target all students, with the broad goal of shifting the BMI curve back toward a healthier distribution. Higher frequency of obesity (24%) over overweight (19%) was also reported amongst New York elementary school children[25]. This among urban children in present study 37 (21.8%) is much higher than overweight children 30 similarity suggests that the trend of nutritional status is gaining similarity with most affluent parts of world.

In present study, corresponding frequency of overweight and obese children in rural area were 5 (2.6%) and 3 (1.5%) respectively. A study among school children in the Union Territory of Puducherry, India found more or less similar findings (overweight 4.4%, obese 2.1%)[26]. The proportion of underweight in rural area in present study was as much as 44 (22.6%,) whereas in urban area it was 13 (7.6%) only. The difference suggests that, double burden of both underweight and overweight children exist in same country. This may suggest that the target of intervention needs to be different in urban and rural area as in urban population the problem is more of over nutrition and in rural area it is under-nutrition.

In this study, combined proportion of overweight and obesity was found significantly higher in urban boys 13 (14.3%)(40.7%) and girls 17 (21.5%)(38%) than in rural boys 2 (1.9%)(2.8%) and girls 2 (2.3%)(5.7%). A cross-sectional study, conducted in the National Capital Territory of Delhi, India, including 5-18 year aged students of all schools, also found enormous dissimilarity of overweight and obesity prevalence in between high income and low income group of students, where prevalence of overweight and obesity in boys of high income and low income group was 21.2% and 2.4% respectively and in girls of high income and low income group was 22.1% and 2.8% respectively[27]. This difference may be multi-factorial which includes difference in socio-economic condition, life style, availability of food, dietary habit, sedentary activity etc. Multiple strategies to combat this difference are needed.

Conclusion

This study has identified a significant prevalence of overweight and obesity among urban school-going children aged 6-12 years. Both male and female individuals are equally impacted. Undernutrition is more prevalent among rural school pupils, impacting both males and females.

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Original Article

Exploring Body Composition of Pre-adolescent Schoolers based on Skinfold Thickness and Arm Girth for Assessing Anthropometry

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Abstract:

Background: Early nutrition plays a pivotal role in shaping long-term health and well-being during adulthood and beyond. Nevertheless, there has been limited exploration into methods for assessing the nutritional status of Bangladeshi pre-adolescent schoolers through anthropometric measurements, encompassing weight, height, skinfold thickness, circumferences (such as head and waist), and limb lengths (including shoulder and wrist). Evaluating nutritional conditions using these measurements reveals variations among different groups, such as boys versus girls and distinctions between rural and urban areas. Part of this study have been adopted from earlier 4 studies but on extrapolating data from the database of Anthropometric Somatotype of Government Primary School Children in Dhaka City.

Materials & Methods: A descriptive cross-sectional study was conducted among 400 government elementary school students aged between 9 and 12 years. Data was collected using a semi-structured questionnaire and analyzed using SPSS.

Findings: Percentage of body fat, total body fat & skinfold thickness of the groups of boys were higher than same age group of girls. Girls BMI ranges are higher than the same age group of boys. In the matter of Body Surface Area, girl child of 9 year has less BSA than 9year age boys, as age goes up the scenario changes gradually. 9-10-year-old boys have higher Arm grith than those age of girls, 10-12 years old girls tend to have higher calf grith than boys of same age group.

Keywords: Triceps, subscapular, suprailiac, anthropometry, calf girth, arm girth, total fat percentage.

Introduction

The assessment of body composition in childhood can be performed with several sophisticated techniques, but in many circumstances, it is more desirable to utilize widely available and simple techniques such as anthropometry.[1]

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Anthropometry has a long history of measuring individual nutritional and health condition since it is a low-cost, non-invasive technology that offers extensive information on various body structure components, particularly muscle and fat components.[2,3] Furthermore, anthropometric measures are very sensitive to a wide range of nutritional status, whereas biochemical and clinical indicators are only relevant in cases of severe nutrition. Anthropometry is the science of measuring the human body in respect of bone, muscle, and adipose tissue measurements.[4] In a word, it is a scientific discipline that deals with the measuring of the human body.[5] Anthropometric measurements include

1. Weight
2. Height (Standing height, recumbent length)
3. Skinfold thickness
4. Circumferences (head, waist, arm)
5. Limb length (shoulder, wrist)[5]

Body mass index (BMI) and mid-upper-arm-circumference (MUAC) are one of the most important

and trustworthy of the regularly used anthropometric measure. Anthropometric measures may be used to calculate a variety of indices and ratios. The body mass index, or "BMI is perhaps the most well-known metric of body fat and is widely regarded as a triable metric for determining chronic energy shortage in people particularly in underdeveloped nations[2,4]. It has strong relationship with fat and fat-free mass, therefore it may be used to assess the body's protein and fat stores[2] .The ratio is roughly constant in normal individuals and someone with a low BMI is underweight for their height.[1] However, there are several drawbacks to relying just on BMI, for example, the ratio of sitting to standing height or the cormic index might affect BMI. The cormic index varies across and among populations.[6]

As a result, without using the cormic index as a correction factor, the sensitivity and specificity of BMI as a nutrition indicator may be poor. Because humans tend to lose fat free mass and gain fat mass as they get older, ageing can affect the functional import BMI at various ages· [6]. The importance of BMI can also be influenced by oedema. When adults are extremely undernourished, they may develop oedema, which falsely mises their weight, making their BMI look more normal than it is [7]. Furthermore, the BMI's universal cut-off cannot be used across diverse populations. As a result, BMI's use as an accurate screening tool for assessing adult undernutrition is limited. Body surface area was designed as a metric for modulating different pharmacological therapies as well as a standard tool for indexing various physiologic parameters including glomerular filtration rate and cardiac output.[8] There are several methods for calculating an individual's body surface area (BSA).

Skinfold thickness is a simple means of estimating body composition which is widely used in children[9]. Now a days childhood obesity is a common health problem in Bangladesh because of its association with increased risk of hypertension, coronary heart disease, diabetes and certain types of cancer. Skinfold thickness is also a good method to measure level of fatness because it directly measures subcutaneous fat layers.[10] Very low values of skinfold thickness indicate the depleted calorie reserves of the body and are correlated with malnutrition. So, this is a good predator of health and chronic disease.[11] Skinfold thickness is also used to calculate anthropometric somatotype.

Assessment of total body fat and percentage of body fat is important in the management of diseases like obesity, cardiovascular diseases and type 2 diabetes mellitus.[12] It is also a good method to measure level of fatness because it directly measures subcutaneous fat layers by measuring skinfold thickness[11]. Different body size, shape and proportions are beneficial in different physical activities. Physical abilities of the players have marked effects on the skill of players and the tactics of the team. To evaluate these physical abilities parameters of the body composition such as the percent body fat and somatotype components are often used.[13]

Measurements of upper arm girth and calf girth can be performed to detect alterations from physiological growth. It reflects inadequate or excess food intake, insufficient exercise and disease. Upper arm girth and call girth measurements are also used in determination of somatotype[14] which has a relatively long tradition in human biology, including changes during growth and maturation[15]. There is limited study specifically looking at anthropometric measurements including height, weight, bi-epicondylar breadth of the humerus and femur, BMI and BSA, despite the fact that anthropometric measurements are often used to assess nutritional status across the world, including Bangladesh. Therefore, the purpose of this study was to determine whether primary school pupils had the aforementioned anthropometric measures.

Materials&Methods:

Study Type

The study was cross sectional study.

Study Place

This present study was conducted in the department of Anatomy, Dhaka Medical College, Dhaka & was performed on government primary school children.

Study Population

Study population was primary school children, age range 9-12 years. Among 580 students, 400 participated in the study. Half of the population were boys and half were girls. The study population was divided into three groups A, B, C according to age and sex of the subject. Group A include age 9-10 years, group B include age 10-11 years and group C include age 11-12 years old children. Each group was subdivided into A1, B1, C1, for boys and A2, B2, and C2, for girls.

Study Period

The study was conducted from January 2012 to December 2012.

Selection of Criteria

A. Inclusion Criteria

The subjects were from 9 years to 12years, the students of class III to class V.

B. Exclusion criteria

Children with any disabilities or chronic condition were excluded from the study.

Sample Size

Study population was 400 government primary school children. Out of 400 children, 200were boys and 200 were girls.

Sampling techniques

Convenient sampling technique was followed to select the needed sample.

Study instrument and study tool

Data was collected using a semi-structured questionnaire. This questionnaire was adapted from earlier research and modified to fit the needs and circumstances of the study purpose. This questionnaire was approved by faculty members of Dept. of Anatomy & MRU in DMC. The developed tool was pretested with 20 students to test the feasibility of the proposed study.

Interview procedure

Students were contacted in their classroom before or after lectures for data collection after obtaining students assent and parental or legal guardian consent. Study objectives was explained before data collection.

Anthropometric measurements

Anthropometric measurements $w_1e_6$re taken following standard protocol and instrument . The height of the body was measured by stadiometer in centimeters (cm) and the weight was measured by weighing scale in kilogram (kg). Bi-epicondylar breadth of the humerus and femur was measured by a digital slide caliper in centimeters (cm). Bi-epicondylar breadth of the humerus was determined by measuring the distance between the medial and lateral epicondyles of the humerus, with the shoulder and elbow flexed to 90 degrees and bi-epicondylar breadth of the femur was determined by measuring the greatest distance between the lateral and medial epicondyles of the femur. Body Mass Index (BMI) has been calculated using the formula mentioned below and Body Surface Area (BSA) was calculated by following Du Bois's formula as mentioned in introduction section.

BMI = weight in Kg / (height in meter) ^{2}

BSA = 0.007184xHeight(m)^0.725xWeight(kg)^0.425

Skinfolds were measured by skinfold caliper in mm. A fold of skin and subcutaneous tissue was firmly pinched between thumb and forefinger and away from the underlying muscle at the marked site. Then the skinfold caliper was placed 1cm below the fingers of the left hand to measure thickness of the fold. During measurement the subject was asked to stand relaxed, except for the medial calf skinfold which was taken with the subject seated .[17]

Triceps skinfold was taken with the subject's arm hanging loosely in the anatomical position. A line was drawn at the back of the arm connecting the acromion and the olecranon processes. A midpoint of the line was determined. Then a fold was raised at the determined site and measurement was taken.[17]

Subscapular skinfold was taken by raising the fold on a line from the inferior angle of the scapula in a direction that was obliquely downwards and laterally at 45 degrees[17].

A point was taken 5-7 cm above the anterior superior iliac spine at the junction of a line to the anterior axillary border and a diagonal line going downwards and medially at 45 degrees. Then suprailiac skinfold was measured by raising the fold at the point[17].

Percentage of body fat (BF%) was calculated by Slaughter et al equations[9].

Boys = 1.21 (sum of 2 skinfolds) – 0.008 (sum of 2 skinfolds)^2 – 1.7

Girls = 1.33 (sum of 2 skinfolds) – 0.013 (sum of 2 skinfolds)^2 – 2.5

[BF% for children with triceps and subscapular skinfolds <35 mm]

Boys = 0.783 (sum of 2 skinfolds)– 1.7

Girls = 0.546 (sum of 2 skinfolds) + 9.7

[BF% for children with triceps and subscapular skinfolds >35 mm]

Total body fat was calculated by following formula[13].

Total body fat (kg) = (Percentage of body fat / 100) x Body mass (kg)

Upper arm girth was measured by a standardized flexible ribbon tape in cm. The subject was asked to flex the shoulder to 90 degrees and the elbow to 45 degrees. Then the children were asked to clasp the hand and maximally contract the elbow flexors and extensors. Then midpoint of upper arm was determined and upper arm girth was measured.[17]

Calf girth was measured by a standardized flexible ribbon tape in cm. The children were asked to stand with feet at a distant. Then maximum calf girth was measured around the calf.[17]

Statistical analysis

All data were checked and edited after collection. Later on, the data were inputted and analyzed using SPSS version 17.0 for windows. Statistical analyses were done by unpaired student's 't' test.

Result

Percentage of body fat and total body fat of group A2, B2 and C2 were significantly greater than group A1, B1 and C1($P<0.001$). In the present study, total body fat of A_2, B_2 and C_2 were higher than A_1, B_1 and C_1 ($P<0.001$).

Table-1: Percentage of body fat and total body fat of boys and girls of Government primary school (n=400)

Group	Percentage of body fat (Mean ± SD)	Total body fat (kg) (Mean ± SD)	P value
A_1(n=68)	10.10±2.47(6.37-20.18)	2.55±0.75 (1.28-5.85)	0.0001***
A_2(n=68)	13.30±4.37(6.17-25.70)	3.32±1.30 (1.1-7.96)	
B_1(n=66)	10.69±3.72(3.87-21.04)	2.85±1.27(1.04-6.63)	0.0001***
B_2(n=66)	14.28±3.99 (7.58 -29.35)	4.41±2.12 (1.59-14.38)	
C_1(n=66)	11.71±3.55(6.37-22.73)	3.38±1.35(1.53-8.07)	0.0001***
C_2(n=66)	15.71±4.65 (4.33-26.23)	5.35±2.47 (1.68-12.27)	

Triceps', subscapular, suprailiac and medial calf skinfold of group A2, B2 and C2 were significantly greater than group A1, B1 and C1.

Table-2: Subscapular skinfold, suprailiac skinfold, Medial calf skinfold of boys and girls of Government primary school (n=400)

Group	Subscapular skinfold (mm) (Mean ± SD)	Suprailiac skinfold(mm) (Mean ± SD)	Medial calf skinfold(mm) (Mean ± SD)
A_1(n=68)	4.51±1.15(2.00-9.00)	4.29±1.44(2.00-9.00)	6.01±1.78(3.00-12.00)
A_2(n=68)	5.85±2.27 (3.00-14.00)	6.11±2.28(2.25-14.00)	7.98±2.37(3.00-12.00)
P value	0.0001***	0.0001***	0.0001***
B_1(n=66)	4.64±1.73(2.00-10.00)	4.32±2.12(2.00-10.50)	7.16±2.26(2.25-14.00)
B_2(n=66)	6.95±2.51(2.50-16.00)	6.73±2.35 (3.00-14.00)	8.15±2.76(3.00-18.00)
P value	0.0001***	0.0001***	0.026*
C_1(n=66)	5.10±1.71(3.00-11.00)	5.23±2.24(2.00-12.00)	7.66±2.49(4.00-14.00)
C_2(n=66)	7.53±2.67(3.75-16.00)	7.64±3.01 (3.00-16.00)	8.73±3.15(3.00-18.00)
P value	0.0001***	0.0001***	0.031*

Body mass index of A1 and A2 groups ranged from 11.60-16.60 kg/m² and 10.90-17.60 kg/m2, respectively and the mean (SD) BMI were 13.66±1.09 kg/m² and 13.80 1.34 kg/m³, respectively. No significant difference in BMI was observed between A1 and A2 study groups (p-0.517). The BMI of B1 and B2 groups ranged from 10.40-18.30 kg/m2 and 10.70-22.60 kg/m², respectively and the mean (SD) body mass index were 13.92+1.51 kg/m² and 14.65+2.26 kg/m², respectively.

Body mass index of B2 was greater than B1 study group (p<0.05). Body mass index of C1 and C2 groups ranged from 12.30-18.00 kg/m² and 11.10-23.10 kg/m², respectively and the mean (SD) body mass index were 14.29+1.28 kg/m² and 15.57+2.42 kg/m², respectively. The BMI of C2 was greater than C1 study group (p<0.001).

Body surface area (BSA) of boys and girls government primary school of Body surface area of A1 and A2 groups ranged from 0.87-1.13 m² and 0.84-1.31 m², respectively and the mean (±SD) body surface area were 0.99±0.05 m² and 0.97 0.08 m², respectively. No significant difference in body surface area was observed between A1 and A2 study groups (p=0.264). The BSA of B1 and B2 groups ranged from 0.89-1.25 m² and 0.89-1.41 m², respectively and the mean (SD) body surface area were 1.02+0.08 m² and 1.10+0.12 m², respectively. Body surface area of B2 group was greater than B1 study group (p<0.001). The BSA of C1 and C2 was ranged from 0.91-1.30 m² and 0.97-1.47 m², respectively and the mean (SD) body surface area were 1.07 0.08 m² and 1.17±0.11 m², respectively. Body surface area of C2 group was greater than Cl study group (p<0.001). B1 group's bi-epicondylar femur width was higher than B2 group. B2 group's body surface area was larger than B1 group. Body surface area of the C2 group was greater than C1 group. (p<0.001).

Table-3: Body Mass Index of boys and girls of Government primary school (n=400)

Group	Boys		Group	Girls		P value
	N	Body Mass Index (BMI)Kg/m² (Mean ±SD)		N	Body Mass Index (BMI)Kg/m² (Mean ±SD)	
Group A_1	68	13.66±1.09	Group A2	68	13.80±1.34	<0.517
Group B_1	66	13.92±1.51	Group B2	66	14.65±2.26	<0.033
Group C_1	66	14.29±1.28	Group C2	66	15.57±2.42	<0.001
Total	200		Total	200		

Table-4: Body surface area of boys and girls of Government primary school (n=400)

Group	Gender	Body surface area (m²) (Mean ± SD)	P value
Group A1 (n=68)	Boys	0.99±0.05	0.264
Group A2(n=68)	Girls	0.97±0.08	
Group B1(n=66)	Boys	1.02+0.08	<0.001
Group B2(n=66)	Girls	1.10±0.12	
Group C1(n=66)	Boys	1.07±0.08	<0.001
Group C2(n=66)	Girls	1.17±0.11	

Gender percentage as per age shown in figure 1

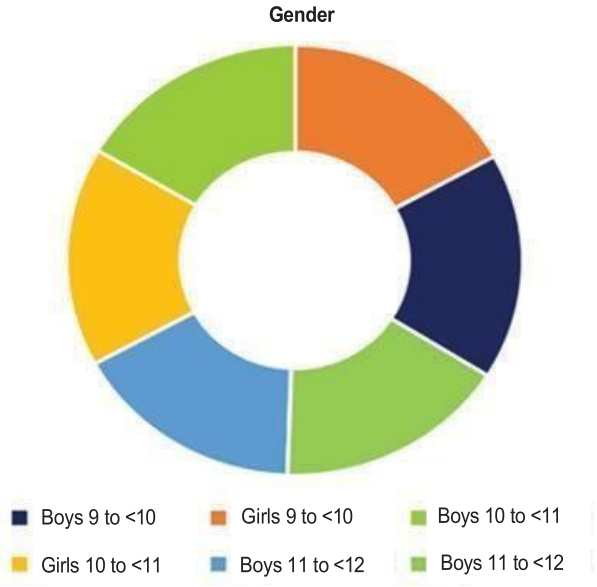

Figure-1 Gender Percentage of Study Populations

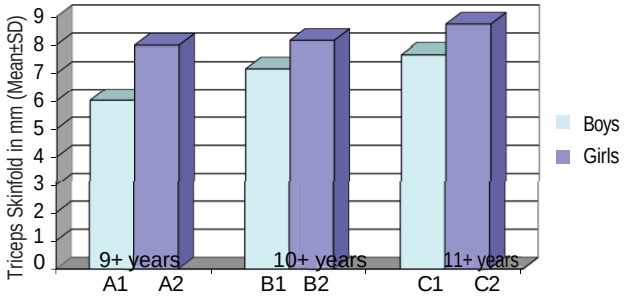

Figure-2 Triceps skinfold of boys and girls of government primary school

Triceps' skinfold of group A2, B2 and C2 were significantly greater than group A1, B1 and C1

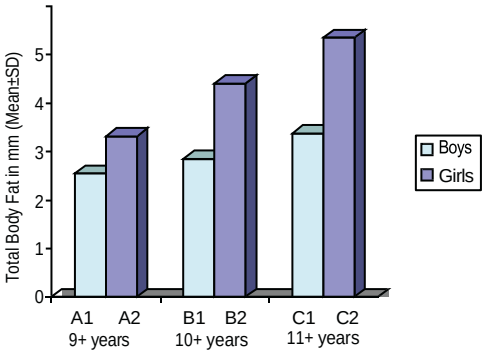

Figure-3: Total Body Fat of boys and girls of government primary school

Total Body Fat of group A2, B2 and C2 were significantly greater than group A1, B1 and C1

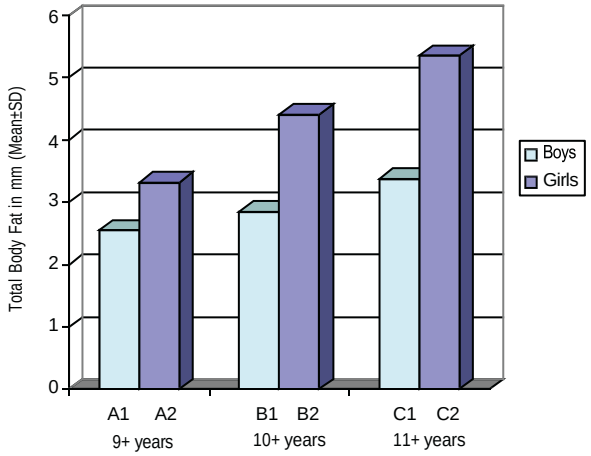

Figure-4 Upper arm girth of boys and girls of government primary school

Upper arm girth of group A1 were significantly higher than group A2, B2 were significantly higher than B1. No significant up difference in upper arm in girth between group C1 gr and C2. A Calf girth of group B2 and C2 were significantly higher than group B1 and C1. No significant difference in calf girth between group A1 and A2. B2 group had a greater weight than B1 group ($p<0.001$), where C2 was heavier than the C1 group. A1 group's bi-epicondylar width of the humerus was greater than the A2 group ($p<0.05$) and B2 group was higher than B1 group.

Discussion

An anthropometric examination of nutritional status was done in the current study. A cohort of children (9-12 years old) from four public primary schools in the city of Dhaka that was diverse in terms of gender, family income, and age were specially chosen. It can give a picture of health and nutritional situation of Bangladeshi school going children.

Boys and girls aged 9 to 10 exhibited average heights of 135.01±3.70 cm and 133.43±6.62 cm, along with average weights of 24.88±2.27 kg and 24.65±3.39 kg, respectively. In the 10–11 age group, boys had mean heights and weights of 136.89±5.04 cm and 26.14±3.57 kg, while girls had mean heights and weights of 141.89±6.64 cm and 29.49±5.78 kg, respectively. Notably, in this age group, girls surpassed boys in both height and weight. As participants progressed to the

11–12 age group, mean heights were 140.70±5.24 cm for boys and 145.42±5.86 cm for girls, with mean weights of 28.39±3.54 kg and 32.90±6.04 kg, respectively.

According to South Indian study, Boys become taller than girls from 14 years and girls become heavier than boys from 10 years; however, there is a crossing over (no difference) in weight at 15 years and from 16 years of age, the boys become heavier [18]

In terms of skinfold measurements, group A2, B2, and C2 demonstrated significantly higher subscapular skinfold compared to group A1, B1, and C1 (P<0.001). Similarly, suprailiac skinfold measurements in group A2, B2, and C2 were significantly elevated compared to group A1, B1, and C1 (P<0.001). The medial calf skinfold in group A2, B2, and C2 was significantly higher than in group A1 (P<0.001), as well as in comparison to group B1 and C1 (P<0.05).

Our study used both skinfold thickness and BMI to measure fat mass, fat-free mass, and % body fat. However, Astrid CJ Nooyens et al. (2007) suggests skinfold thickness over BMI to measure body fatness [19]

Total body fat of A_2, B_2 and C_2 were higher than A_1, B_1 and C_1 (P<0.001) which express girls had more fat in body then boys. Percentage of body fat also shows same kind of result.

A higher fat mass among girls than boys and higher % body fat in girls than boys were observed in the current study. However, Soledad Aguado-Henche et al. (2011) observed no gender-specific difference [20]. However, Jaydip Sen & Nitish Mondal (2013) reported a sex-specific significant difference in FM and FFM among children 5–12 years in West Bengal, India [21]. Zhang Ying-Xiu, Wang Shu-Rong et al found percentile values for triceps and subscapular SFs of Chinese and American children were lower than the per-centiles of boys and girls in the present study, performed in 8568 Chinese ,783 North-American children and adolescents .[22]

Body mass index values for boys and girls aged 9 to 10 were 13.66±1.09 and 13.80±1.34 kg/m^2, respectively, in the current study. These two groups had no significant statistical difference between them. Boys and girls aged 10 to 11 had mean body mass indices of 13.92±1.51 kg/m^2 and 14.65±2.26 kg/m^2, respectively. Statistics showed that this difference was not significant. Boys and girls between the ages of 11 and 12 had mean BMIs of 14.29±1.28 kg/m^2 and 15.57±2.42 kg/m^2, respectively. BMI values were higher in girls than boys and increased as the age of the participants increased. The BMI values for different age categories in the present study were smaller than similar studies conducted in Bangladesh and India.[23,24] Observed results were found to be similar in a study conducted among vegetarian and non-vegetarian Nepalese children.[25] According to World Health Organization's (WHO) growth reference for 5-19 years, the present study populations, the students are found to be underweight.

Boys and girls aged 9 to 10 showed calculated mean body surface areas (BSAs) of 0.99±0.05 m² and 0.97±0.08 m², respectively, with no discernible correlation between the two groups. In the 10–11 age group, boys had mean BSAs of 1.02±0.08 m², while girls exhibited a slightly higher value of 1.10±0.12 m². This variation was statistically noteworthy. 1.07±0.08 m^2 and 1.17±0.11 m^2 was mean BSAs respectively of boys and girls between the ages of 11 and 12. Additionally, this distinction was statistically significant.

Limitations

The present study has certain limitations. Firstly, no information was collected on parental education, lifestyle-related variables. Hence, it was not possible to explore the dietary habits or physical activity behavior of children. Secondly, data were collected from students of four schools in the Dhaka district. Hence, the present results might not be generalizable to all school children in Bangladesh. The study was performed based upon earlier 4 published reports.[26-29]

Recommendation

It could be beneficial to conduct more research with a larger sample size and a proportionate number of samples from various categorical variables to comprehend the children's nutritional status and its predictive factors. Studies with different categories like industrial workers, job holders, day laborers, and sportsmen are recommended. Recording the medical history of children and families can help us know the roots of the problems.

Conclusion

Analyses of body composition and anthropometric measurements indicated that children's nutritional status was below the standard requirement. This study represents a summary of 4 published papers only because we intended to publish summarized zest or extracts from each of those morphometric studies to

show in one place or study. This will assist our postgraduate or graduate students not only doctors but also for nutritionists. Findings of this study remains more prudent method or technique to yield better findings which remains more valuable in terms of digging out integrated anthropometric values yet being more useful and valuable an approach to show children's nutritional status & /or morphometric assessments.

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Original Article

Feto-maternal Outcomes in Adolescent and Young Adult Primigravid Mothers in a Tertiary Care Hospital in Bangladesh

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Abstract

Introduction: Adolescent pregnancy is a worldwide common health problem bearing serious social and medical implications relating to maternal and child health. In Bangladesh, pregnancy among adolescent girls is high. Approximately 66% of women under 18 years old reporting a first birth.

Objectives: We aimed to examine the obstetrical and neonatal outcomes of adolescent mother associated with first birth.

Materials & Methods: A cross-sectional descriptive study was undertaken to compare the different socio-demographic characteristics and pregnancy outcomes of adolescent primigravida mothers with those of adult primigravida mothers in a tertiary-care hospital in Bangladesh. A sample of 61 adolescent mothers in cases and 61 adult mothers of comparison group comprised the study subjects. Data were collected through interviews and by observations using a predesigned schedule.

Results: Results revealed that the adolescent mothers had a higher incidence (24.6%) of caesarian deliveries compared to 4.9% in the adult mother (OR: 6.304, 95% CI: 1.712-23.1, p=0.002). Term delivery was also higher 85.2% among adolescent group (OR: 2.82, 95% CI: 1.161-6.842, P=0.019). However, adult mother had greater incidence of postdated delivery (OR: 0.236, 95% CI: 0.073-0.764, P=0.011) and spontaneous onset of labor (OR: 0.442, 95% CI: 0.212-0.921, P=0.028). There was no significant difference found regarding neonatal outcomes like preterm, low birth weight, low APGAR score and NICU admission. Most of the adolescent mother are jobless in comparison to adult mother (p=0.015).

Conclusion: Adolescent pregnancy is still a rampant and important public-health problem in Bangladesh with unfavorable pregnancy outcomes which can be overcome by creating awareness with quality antenatal, intranasal and postnatal care.

Key words: Primigravida, Adolescent pregnancy, Adult mother, Obstetric outcomes,Neonatal outcomes.

Introduction

Adolescent pregnancy is defined as a pregnancy in girls 10–19 years of age. It is estimated that more than sixteen million females aged 15 to 19 years give birth each year, which represents approximately 11 percent of all births globally[1]. Although adolescent fertility rates are decreasing worldwide, around 18 million girls under the age of 20 give birth each year[2]. Two million of these births are from girls under 15 years of age [2].More than 90% of these births occur in low and middle-income countries[1]. Most adolescent pregnancies and childbirths take place in west and central Africa, east and southern Africa, South Asia, Latin America, and the Caribbeans[2]. Different pieces of literature show that the prevalence of adolescent pregnancy varies across regions of the world. In the Asia Pacific regions, it ranges up to 43%in Bangladesh and from11.1% to 47.3%in Nepal [3].

In Bangladesh, the legal minimum age for marriage is 18 years for girls, but enforcement of this law is weak [4]. The present-day median age at first marriage is 15.8 years, and 66% of Bangladeshi women report having children before the age of 18 [5]. Patriarchal norms and social structures make it difficult for girls to refuse sex or

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use contraceptives particularly in the context of marriage [6].

Young spouses struggle to negotiate family planning decisions, reducing their capacity to schedule and spacing pregnancies for improved health and well-being. Misconceptions regarding contraception discourage to delay first pregnancy[6]. Because of this combination of variables, the prevalence of adolescent pregnancy has only slightly decreased over the last two decades; in 1993, adolescents accounted for 33% of all births or pregnancies, compared to 30.8% in the year 2014[7].

According to the literature, several sociodemographic, cultural, and individual variables are related with adolescent pregnancy. Approximately 90% of adolescent pregnancies in the developing world are of married females, owing to their more frequent exposure to sex and pressure to conceive shortly after marriage [8, 9]. As a result, majorities of adolescent pregnancies (about 75%) are planned[1,10].

Enforced social norms regarding gender roles, deeply embedded in community and familial contexts, equate a girl's value with her ability to reproduce [6, 11]. Married adolescent females are less likely to engage in family planning, due to a lack of awareness about contraception and male-dominated couple dynamics, which restrict their individual ability to regulate the timing and frequency of pregnancy [4, 12]. In addition, adolescents face an abnormal number of barriers to receiving reproductive treatments inside the official health systems due to lack of physical and financial access to health care facilities[13].

Studies have shown that adolescent pregnancy has poor maternal and neonatal health outcomes [1, 2, 8]. Issues during pregnancy and delivery are the second leading cause of mortality among 15-19 years old females worldwide [1].

Babies born to adolescents mothers had a significantly higher risk for mortality than those born to women aged 20 to 24 years [1, 15]. School dropout [14, 15], poverty [2, 15], high rate of marriage [8], pregnancy-induced hypertension and induced abortion [1, 14] are some of the consequences of adolescent pregnancy on the mother. Adolescent pregnancy can have serious consequences for the fetus, including preterm birth, low birth weight, stillbirth, and high fetal and neonatal death rates[16]

Materials and Methods

Study setting and design

The study was conducted at Ad-din Medical College and Hospital in Dhaka during January 2022 to June 2022. This is one of the tertiary-care hospitals in Dhaka, with over 10,000 deliveries annually. The study undertaken was of a cross-sectional, descriptive type with two group cases and comparison respectively.

Adolescent pregnancy was defined as pregnancy occurring during the maternal ages of 10-19 completed years at delivery. Primigravida adolescent mothers aged 13-19 years were regarded as the cases (Group A) while primigravid adult mothers aged 20-30 years formed the comparison group (Group B). Primigravida women were chosen to minimize the impact of parity. Age between 20 and 30 years was considered since this age-group is generally regarded as safe for childbirth. Ages above 30 years constituting elderly primigravida, multiple gestation, women with major medical illnesses before & during pregnant state, intrauterine fetal death, congenital anomaly baby and any neonatal complication occurring after 24 hours of delivery were excluded from the study.

Variables relating to the socio demographic characteristics of the women in two groups, such as, mother's education and occupation, marriage age, socio-economic status, antenatal care, Contraceptive use, gestational age at delivery, mode and method of delivery, onset of labor and neonatal outcomes were observed.

Regarding the antenatal care (ANC); the women who had ANC were subdivided into 2 groups regular (≥4 antenatal visit) and irregular according to the visits to private doctors or hospital and ANC clinics units. Delivery before 37 completed weeks was defined as preterm and after 40 weeks defined as postdated pregnancy. Intra-partum Partograph was performed for each woman.

The maternal status, labor progress, delivery characteristics and neonatal outcomes were reviewed and recorded. Cesarean section was done for obstetric indications of a patient with active labor pain which include failure of progress of labor (arrest of dilatation or descent despite efficient uterine contractions), persistent or non-assuring FHR pattern or fetal distress, CPD etc.

All the neonates were assessed for weight, APGAR score at one and five minutes after birth, and those who were

admitted to neonatal care unit (NICU) were followed for 24 hours.Birth weight less than 2.5 kg was taken as low-birth weight baby.

Collection and analysis of data

The principal investigator and her team members visited the labor ward and operation theatre regularly two days in a week. However, cases admitted for delivery were not evenly distributed. Adolescent and young adult mothers were enrolled.

Data were gathered by observing and conducting interviews, following a predetermined schedule. The first interaction with research participants for data collection occurred shortly after the baby's birth. The research participants were questioned according to the schedule as soon as their condition allowed, and in situations where they had not recovered, their closest relative was interviewed. Data were validated, and missing information was obtained from antenatal records, if accessible.

Statistical analysis

The study's findings were statistically examined using the methodologies, descriptive statistics include tables, graphs, frequencies, percentages, means, and standard deviations & inferential statistics: The Chi square test and one-way ANOVA test (F test) were employed to determine the relationship between the relevant variables. Data were input and analyzed using the SPSS program. P-value < 0.05 was deemed statistically significant.

Ethics

Informed verbal consent was obtained from all the study subjects before they went into active labor.

Results

Sociodemographic characteristics

All adolescent pregnant mothers belonged to the age-group of 13-19 years. Whereas, there was no adolescent mother got pregnant aged less than 16 years. Their mean (±SD) age of pregnancy was 18.4±(0.5) years. The maximum number of adult mother became pregnant between the age of 20-24 years approximately 73.8%, and only about 26.2% belonged to the age-group of 25-30 years. Their mean (±SD) age was 23.0(±2.5) years. The different socio-demographic characteristics are summarized in Table 1.

Table-I : Sociodemographic Characteristics

Variables	Group A% (n=61)	Group B% (n=61)	P-value
Maternal Age (mean ± SD)	18.43±0.531	23.03±2.569	0.000
17-19 years (n=61)	100(61)	0.0(0)	0.000
20-24 years (n=45)	0.0(0)	73.8(45)	
25-30 years (n=16)	0.0(0)	26.2(16)	
Educational Status			
Primary(n=16)	21.3(13)	4.3(3)	0.000
Secondary(n=39)	42.6(26)	21.3(13)	
Higher Secondary(n=32)	34.4 (21)	18.0(11)	
Graduate(n=28)	0.0(0)	45.9(28)	
Illiterate(n=7)	1.6(1)	9.8 (6)	
Occupation			
Home Maker(n=110)	96.7(59)	83.6(51)	0.015
Office Job(n=12)	3.3(2)	16.4(10)	
Socio Economic Status			
low class(n=4)	4.9 (3)	1.6 (1)	0.135
middle class(n=115)	95.1 (58)	93.4 (57)	
high class(n=3)	0.0 (0)	4.9 (3)	

Table-2: Age of Marriage

Variables	Group A% (n=61)	Group B% (n=61)	P-value
Age at marriage (mean ± SD)	16.8±1.113	21.18±2.988	0.000
14-16yrs(n=25)	39.3(24)	1.6(1)	0.000
17-19yrs(n=54)	60.7(37)	27.9(17)	
20-24yrs(n=34)	0.0 (0)	55.7(34)	
25-29yrs(n=9)	0.0 (0)	14.8(9)	
Time interval between marriage and1st conception (years)	1.5633±1.03	1.7708±1.27	0.307

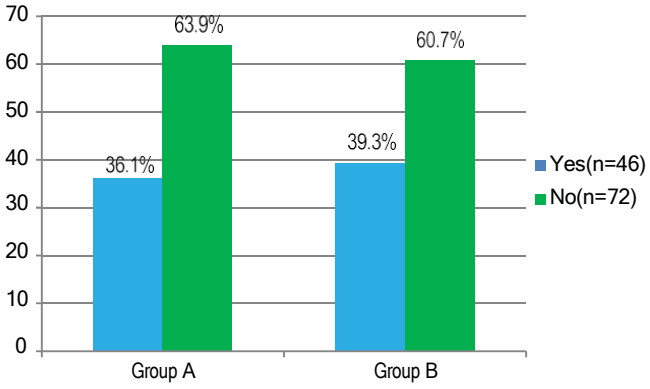

Figure-1: Use of Contraceptives

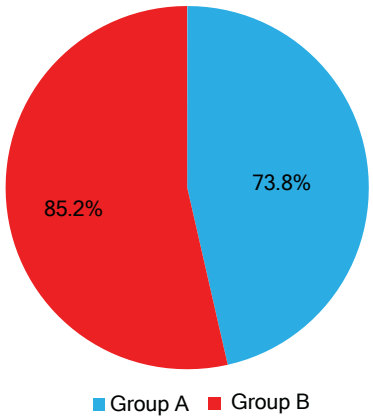

Figure-2: Antenatal Care Received

Table-3: Pregnancy Outcomes

Variables	Group A %(n=61)	Group B %(n=61)	Odds Ratio (95%CI)	P-Value
Gestational age at delivery (mean ± SD) (in weeks)	38.7±1.46	39.1±1.76		0.251
Mode of delivery				
Vaginal Delivery(n=102)	73.8(45)	93.4(57)	0.197 (0.062,.632)	0.003
Vaginal Instrumental Delivery(n=2)	1.6(1)	1.6(1)	1.000(0.061,16.36)	1.000
Cesarean Section(n=18)	24.6(15)	4.9(3)	6.304(1.712,23.1)	0.002
Time of delivery				
Term(n=93)	85.2(52)	67.2(41)	2.82(1.161,6.842)	0.019
Preterm(n=11)	8.2(5)	9.8(6)	0.818(0.236,2.839)	0.752
postdated(n=18)	6.6 (4)	23.0(14)	0.236(0.073,.764)	0.011

Table-4: Neonatal Outcomes

Variables	Group A %(n=61)	Group B %(n=61)	Odds Ratio (95%CI)	P-Value
Birth weight(mean ± SD)	2.758±.395	2.756±.499		0.075
Low birth weight (n=26)	18.0(11)	24.6(15)	0.675 (0.281,1.618)	0.377
APGAR Score in 5th min(<8)(n=9)	9.8(6)	4.9 (3)	50.564(0.647,47.812)	0.299
NICU Admission(n=21)	14.8 (9)	19.7 (12)	0.707(0.273,1.82)	0.472

Abbreviations: NICU: Neonatal Intensive Care Unit

In our study, a high number of (9.8%) non-educated women were found in adult group. Most of the adolescent mother was less educated about 42.6% completed secondary and approximately 34.4% in high school compared to higher education level in adult primigravid mother approximately 18.0% in high school and 45.9% in university. Most of the mothers were unemployed about 96.7% in group A and 83.6% in group B. Among adolescent group only 3.3% women were

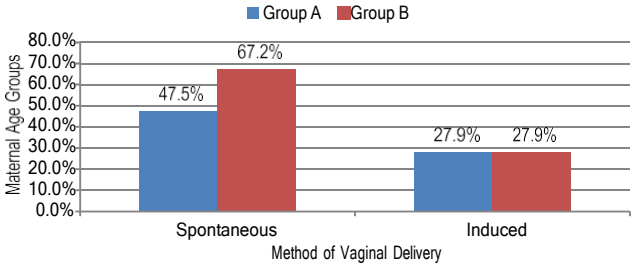

Figure-3: Method of Vaginal Delivery (Onset of Labour)

working in comparison to 16.4% of adult women were employed in different sector, which was statistically significant (p=0.015), table-1.

During the study period, all the mothers were married in both the groups. The mean age of marriage was 16.8(±1.1) years in adolescent group and 21.2(±2.9) years in adult group. The mean duration between the marriage and the conception was 1.5(±1.0) years in adolescent group and 1.8(±1.2) years in adult group (p=0.307), table-2.

The percentage of ever use of contraceptive methods in adolescent mothers was 36.1% as opposed to in older mothers 39.3%. Maximum percentages >60% of mothers in both groups did not use contraception ever, figure-1.

A higher proportion approximately 85.2% of the adult mothers received a minimum of four antenatal checkup compared to the adolescent mothers about 73.8%. There was no significant difference of antenatal care between adolescent and older mothers (p=0.116), figure-2.

Outcomes of pregnancy

In our study, the mean gestational age at birth was 38.7(±1.4) weeks in adolescent group and 39.1(±1.7) weeks in adult group, which was not significant (p=0.251). The adult mothers had a higher proportion 93.4% of normal vaginal delivery compared to the adolescent mothers 73.8% (p=0.003), statistically significant. About 24.6% of the adolescent mothers had caesarian delivery compared to 4.9% of the adult mothers. However, the association regarding the mode of delivery was significant (p=0.002, OR: 6.304, 95% CI: 1.712-23.1).The incidence of term deliveries were higher in adolescent group 85.2% compared to adult group 67.2%, which was statistically significant (p=0.019, OR:2.82, 95% CI: 1.161-6.842), table 3.

The adult mothers had a higher proportion 23.0% of post-dated pregnancies compared to the adolescent mothers6.6%, which was statistically significant (p=0.011, OR:0.236, 95% CI:0.073-0.764). The adolescent mothers had a lesser proportion8.2% of preterm deliveries compared to the adult mothers 9.8%, table 3.

Among all the vaginal delivery, the adult mother had a higher proportion 67.2% of spontaneous labor compared to adolescent mother 47.5%. This association was statistically significant (p=0.028, OR: 0.442, 95% CI: 0.212-0.921), figure 3.

Regarding neonatal outcomes, the mean birth weight was 2.75(±.395) kg in the adolescent group and 2.75(±.499) kg in adult group and the difference was not statistically significant (p=0.075). The incidence of low birth weight was higher in adult group (p=0.377, OR: 0.675, 95%CI: 0.281-1.1618). The 5th min APGAR score were lower among adult group (P=0.299, OR: 5.564, 95% CI: 0.647-47.812).Higher rate of neonatal admission in NICU was detected in adult group 19.7% as compared to adolescent group 14.8% (P=0.472, OR: 0.707, 95% CI: 0.273-1.82), but not statistically significant, table 4.

Discussion

Adolescent pregnancy rates in developed countries have decreased over the previous 70 years. But in developing countries like Bangladesh adolescent pregnancy is still rampant with enormous impact on maternal and child health. Thus, adolescent pregnancy becomes a public health problem in Bangladesh and needs to be tackled on a priority basis.

Adolescent pregnancies put mothers at high risk to many health-related complications and their newborns to poor birth outcomes. Adverse outcomes of adolescent pregnancy arise not only from physical and medical causes but are also associated with individual, familial and socio-cultural factors besides lack of access to healthcare, contraception, and other resources which is the prevailing situation in most developing countries. This study aimed at finding the distribution of different socio-demographic characteristics, such as education, occupation, socioeconomic status etc., and pregnancy outcomes between adolescent mothers and their older counterparts.

Although the legal age at marriage is 18 years for females and 21 years for males in Bangladesh, early marriage is common. In our study, by the age of 14-16 years 39.3% of female were married and by the age of 17-19 years this figure rises to 60.7% in adolescent group. However, among adult group, 29.5% women were married within 19 years and 55.7% women were married within 20- 24 years. All women were married during their first pregnancy; so, the low age at marriage automatically links to early onset of sexual activity and thereby fertility. The mean age of adolescent primigravida mother was 18.43(±0.531) years compared to 23.03(±2.56) years in adult mother. The time period of interval between the marriage and first conception was found to be less among adolescent mother 1.56(±1.0) years in comparison to the adult group 1.77(±1.2) years. Similar figure has been reported in a study of India, where 26% of female are married by the age of 15, and by the age of

18 years this increases to 54% [17,18]. It has been reported that there is increase fertility among the adolescent group. Study shows lesser time interval of conception in adolescent mother in comparison to adult mother[18].

Women's education and adolescent motherhood were shown to have an inverse connection. Possible explanations for the inverse relationship between educational attainment and adolescent motherhood include lower educated women having insufficient knowledge about the high risk period of becoming pregnant, being unaware of family planning methods, and the negative effects of early childbearing on their health and children. These factors are further aggravated by the fact that lower educated women have lower levels of empowerment within family and society which eventually translate into higher level of adolescent motherhood [19,20]. Whereas, in this study, we found the illiteracy rate was higher among the adult mothers 9.8% compared to the adolescent mothers 1.6%.

In our study, maximum portion of mother (≥93%) belongs to middle class family and most of them(≥83%) were engaged in household works, only few adult mother (about 16.4%) were employed in different sectors. Several study showed, poor socioeconomic status were found to be significantly associated with adolescent mother in contrast to the adult group. In a lower literacy society, individuals are more inclined to follow the age-old cultural tradition of marrying off a female child at a young age. Poverty and sex biasness act as a catalyst for early marriage of girl child[18,20,23].

The percentage of ever use of contraceptive methods in adolescent mothers was 36.1% as opposed to in older mothers 39.3%. Maximum percentages >60% of mothers in both groups did not use contraception ever. Similar result showed in one study, the contraceptive knowledge and use were lower in adolescent mothers in comparison to older mothers of 20–25 years of age [18].

In this study, Adolescents are less likely to seek regular antenatal care (≥4 visits); 73.8% in adolescent groups had regular ANC as compared to 85.2% in non-adolescent pregnant group (P= 0.116). A study at Egypt and Sudan, shows that 63.3% of adolescents had ANC as compared to 82.3% of older women[21]. Other studies also showed that adolescents had poor antenatal care [22]. This indicates that the adolescent mothers were less careful about their pregnancy probably because of the lack of awareness and maturity.

In our study, adolescent mothers had a higher proportion of caesarian delivery compared to the adult mother. About 24.6% of the adolescent mothers in this study had caesarian delivery compared to 4.9% of adult mothers. However, the association between the age of mothers and the mode of delivery was significant (p=0.002). The most common overall indication for caesarean section was cephalopelvic disproportion (26.7%) followed by fetal distress(20.0%). Indication for caesarean section in cephalopelvic disproportion and fetal distress was more commonly found among the adolescent mothers than among the adult mothers. Views on the process of delivery in pregnant adolescents vary greatly. Various literatures cited that there is biological immaturity of the adolescent pelvis which causes cephalopelvic disproportion leading to an increase in cesarean section rate[23-26]. Some authors have reported a higher rate of instrumental deliveries in the case of adolescent pregnancies [14-16]. Other authors have reported lower rates, and some contradicted this view [27-29].

The adult mothers had a higher proportion (23.0%) of post-term pregnancies compared to the adolescent mothers (6.6%), which was statistically significant (p=0.011). A study at India, showed the similar result of 7.7% adult mother had post-term pregnancies compared to adolescent mothers 2% [30]. Among vaginal deliveries higher percentage of adult mother 67.2% goes to spontaneous labor than adolescent mother 47.5%, however, this result is statistically significant(p=0.028).

In regard to neonatal outcomes, lower incidence of low birth weight baby were seen in the adolescent group 18% as compared to 24.6% in adult group (P =0.377). This observation contradicts the findings of several other authors [31-33]. Low APGAR scores in 5th minute were found among infants of adult mothers, which is not consistent with other studies[34]. NICU admission was higher in adult group 19.7% as compared to adolescent group 14.8% and the most common reasons of admission were intrapartum fetal distress, prematurity and low birth weight etc.

The study's drawback is that it was done at a tertiary hospital with high-quality maternal and newborn care facilities, thus the findings may not be representative of the entire community. Moreover, sample size is small due to limited study period. We also did not evaluate complications of pregnancy among adolescent mothers. However, regarding neonatal outcomes some bias

might have been introduced, as the complications delayed beyond 24 hours could not be observed since there was no scope of any follow-up.

Conclusions

Adolescent pregnancy may not be associated with serious obstetrical complications as perceived, if high-quality antenatal, intranasal, and postnatal care are provided. Higher level of education is an important deterrent to early marriage and early childbearing. Delaying marriage and childbearing among adolescents and married females is vital to bring down the population growth in nations with middle and low incomes. Quality healthcare facilities and a committed educational program may effectively decrease the prevalence of adolescent pregnancy in developing countries.

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Review Article

Cardiovascular Endocrinology: A Game Changing Concept

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Clearly, the term gets its wordy justification from two established medical disciplines (e.g. cardiology and endocrinology). Combining the two, however, contains more than just the mutual interest in, for instance, diabetes mellitus and its complications that, nowadays, are dominantly cardiovascular. Cardiovascular endocrinology must explore new ways of thinking beyond established hormonal axes, and it shouldn't just focus on discovering new markers of disease or treatment strategies not only clarify existing mechanisms but also reveal novel connections between the cardiovascular system and various blood-borne bioactive substances and their corresponding cellular targets. A second aspect of cardiovascular endocrinology involves the modern treatment of hypertension, cardiac arrhythmias, ischemic heart disease, and congestive heart failure by blocking or enhancing different hormonal systems. The clinical use of angiotensin-converting-enzyme inhibition or receptor blocking is now almost as commonly recommended as vitamin supplements and fish oils. Moreover, adrenergic receptor blockade constitutes a cornerstone in hypertension, cardiac arrhythmias and heart failure, and aldosterone inhibition is also an important supplement in heart failure treatment. Thus, when the heart does not fulfill its overall hemodynamic functions, neurohumoral activation takes over, usually with dire consequences for the suffering heart muscle. Clinicians must then intervene with treatment that lower morbidity and mortality using drugs targeted at endocrine axes. Thus, cardiovascular endocrinology has for a long time been applied in the modern medical treatment of cardiovascular patients, and the search for new enhancing or blocking „endocrine" drugs is surely underway.

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The central organ in the cardiovascular system is the heart itself. In a review known heart-derived hormones, focusing on GDF15, myostatin, and ANP/BNP, and their biology in the cardiovascular system. The TGF-<unk> family includes GDF-15 as a distinct member. In the cardiovascular system, cardiac synthesis and secretion of GDF-15 are substantially increased in various cardiovascular diseases (e.g., heart failure)[1,2] Besides being a valuable serum biomarker for cardiovascular disease, recent findings indicate that GDF-15 secreted by the heart also hinders pediatric body growth by inhibiting liver growth hormone signaling, thus functioning as a heart-derived hormone[3]. Myostatin is another member of the TGF-ß superfamily and was first discovered through screening in a mouse skeletal muscle library.5In the cardiovascular system, myostatin levels in both the heart and circulation are elevated in myocardial infarction or heart failure [4,5]. Clinical studies demonstrated a positive correlation between plasma myostatin levels and the heart disease biomarker N-terminal pro-BNP in congestive heart failure patients. Additionally, in acute myocardial infarction, myostatin levels were associated with infarct size, suggesting its potential as a biomarker for these heart conditions. Cardiac myocytes produce and release natriuretic peptides with potent effects on renal sodium excretion, blood pressure and vascular permeability. Atrial and B-type natriuretic peptides are

also plasma markers of heart disease, and measurement of the bioactive peptides, or their precursor fragments, is recommended in heart failure diagnostics. Unlike ANP and BNP, C-type natriuretic peptide (CNP) is widely expressed and not heart-specific[6,7]. However, cardiac synthesis of CNP is substantially elevated in patients with chronic heart failure[8]. Initially, the cardiomyocytes were believed to be fairly inefficient hormone- producing cells with little biosynthetic capacity. However, the heart cells are now known to be highly specialized endocrine cells with complex and elaborate post-translational processing. In perspective, it may therefore be worthwhile to look for other regulatory peptides produced in the heart, as endocrine cells often harbor more than one bioactive substance. One such substance has been suggested to be apelin, a small potent peptide with isotropic effects, which is otherwise produced in the stomach and the vasculature. The precise role for cardiovascular apelin clearly remains of potential interest, both as therapy and as a biomarker. Another potential cardiac-derived peptide is relaxing, although the precise role of this local expression is still unresolved.

In the darkness of the bowel resides the largest endocrine system in the human body. With more than 100 known bioactive substances, the endocrine gut is involved in almost every physiological mechanism. From a cardiovascular point of view, most attention has been paid to insulin and later the incretins (which facilitate insulin release). In fact, insulin infusion used to be considered a reasonable treatment of acute myocardial infarction, and the days of glucose– insulin–potassium infusion are not completely over. The cardiac myocytes express receptors for both insulin and glucagon, and thus they also affect cardiac metabolism and function. Interestingly, both peptides seem to possess independent cardioprotective properties, that is they protect cardiomyocytes from apoptosis under different forms of stress. This cardioprotective aspect will certainly be pursued in the near future, as the need for such adjuvant therapy is overwhelming. In the light of the present interest in incretin, it should not be overlooked that the gut still produces a large number of other bioactive peptides with potential effects on the cardiovascular system.

Finally, other hormonal axes are involved in cardiovascular function and disease. For decades, the pituitary vasopressin (an antidiuretic peptide) has been known to be involved in the heart failure syndrome. Recently, a method for measuring the stable C-terminal copeptin fragment from the vasopressin precursor was introduced and a new marker in heart failure was established. Chromogranins are another example of new possible players in cardiovascular disease, where chromogranin A concentrations in plasma are associated with mortality after infarction, and chromogranin A and chromogranin B even seem to be produced in the heart itself. Last, but not the least, adipokines such as leptin and adiponectin also seem to be important players in cardiovascular disease.

Clinical Endocrinology

A. Hypertension

Hypertension is widespread and often falls within the domain of general medical practice. While most cases are deemed "essential" with an undetermined cause, advancements in understanding hypertension mechanisms have reduced the proportion of patients falling into this category. Identifying the underlying cause is beneficial, as specific approaches can sometimes lead to a cure or significant improvement in hyper- tension. A number of hormonal disorders can cause hypertension (Table 1). As mentioned earlier, there is a high incidence of primary aldosteronism. Contrary to past beliefs, it is now recognized that in the majority of diagnosed patients, the serum potassium level falls within the normal range. The diagnosis of primary aldosteronism can lead to either surgical cure of hypertension or .targeted pharmacotherapy. Aldosterone- producing adenoma patients may undergo unilateral laparoscopic adrenalectomy, while those with bilateral idiopathic hyperplasia are typically treated medically, often with a specific mineralo-corticoid receptor blocker. Realization of the need for surgical cure or MR blockade will be increasing with the emerging data showing that aldosterone has deleterious cardiovascular effects independent of its blood-pressure-elevating activities. Treating blood pressure alone may be inadequate in addressing the overall management of the condition.

Table1: Endocrine causes of hypertension

Genetic
Type I AME
Type II AME
Acquired
Licorice or carbenoxolone ingestion (type I AME)
Cushing"s syndrome (type II AME)
Thyroid-dependent
Hypothyroidism
Hyperthyroidism
Parathyroid-dependent
Hyperparathyroidism
Pituitary-dependent
Acromegaly
Cushing"s syndrome
Insulin-related
Insulin resistance
Adrenal-dependent
Pheochromocytoma
Primary aldosteronism
Hyperdeoxycorticosteronism
Congenital adrenal hyperplasia
11ß-Hydroxylase deficiency
17α-Hydroxylase deficiency
Deoxycorticosterone-producing tumor
Primary cortisol resistance
Cushing"s syndrome
Apparent mineralocorticoid excess (AME)/11ß-hydroxysteroid dehydrogenase deficiency
Renin-related
Renovascular disease
Renin-secreting tumor
Coarctation of the aorta
Perirenal hematoma (Page kidney)

AME: Apparent Mineralocorticoid excess

Hypertension due to a pheochromocytoma is much more rare (estimated incidence 1.55–8 per million persons per year) than that due to primary aldosteronism [9,10]. Suspecting, confirming, localizing, and resecting pheochromocytomas is crucial due to several reasons: 1) Surgical removal of the tumor can cure associated hypertension, 2) There is a risk of a lethal paroxysm, and 3) At least 10% of these tumors are malignant. Diagnosis is especially important because the hypertension may be most refractory to therapy, and, rarely, if a tumor is present, it may become malignant.

Renovascular hypertension is another curable form whose incidence is increasing with the increased age of the population [11,12] . Surgical therapy or percutaneous transluminal renal artery angioplasty can provide a cure, and specific therapy involving blockade of the renin-angiotensin system is generally beneficial in most cases.

B. Metabolic syndrome

The National Cholesterol Education Program (NCEP) Adult Treatment Panel III (ATPIII) provides one of the most widely used definitions for metabolic syndrome. The diagnosis is confirmed with the presence of any three of the following five traits:

- Abdominal obesity or we can define as waist circumference ≥102 cm (40 in) in men and ≥88 cm (35 in) in females;
- Blood pressure ≥130/85 mmHg or medicinal treatment for hypertension;
- Fasting plasma glucose (FPG) ≥100 mg/dL (5.6 mmol/L) or medicinal treatment for hyperglycemia or diabetes;
- Serum triglycerides ≥150 mg/dL (1.7 mmol/L) or medicinal treatment for hypertriglyceridemia;
- Serum high-density lipoprotein (HDL) cholesterol <40 mg/dL (1 mmol/L) in males and <50 mg/dL (1.3 mmol/L) in females or drug treatment for low HDL cholesterol.

Current treatments involve attacking the individual components, although newer pharmaceuticals such as the thiazolidinediones affect more than one component simultaneously.

C. Obesity

Obesity is increasingly recognized as a pandemic of major proportions and a disorder that is life threatening

and not just a cosmetic problem [13]. Endocrinologists are actively advancing our understanding of the mechanisms behind obesity, with several specific mechanisms already identified. As these mechanisms become clearer, it holds the promise of enhanced therapies. Notably, various specific treatments are currently in development. Additionally, it's crucial to recognize that obesity can be indicative of endocrine diseases, such as hypothyroidism and Cushing"s syndrome. When approaching the obese patient, the clinician must be aware of these.

D. Dyslipidemia

Lipid disorders contribute significantly to atherosclerosis. Gradually, management has shifted from total cholesterol to LDL and HDL, and now includes additional consideration of other atherogenic species such as lipoprotein (a), homocysteine, and C-reactive protein, atherosclerotic processes are influenced by thrombogenic and inflammatory factors.. Furthermore, the upper limit of tolerability for LDL levels has crept down, such that a much higher proportion of patients have abnormal levels [14,15]. There is also more recent awareness that triglycerides comprise a risk factor for atherosclerosis that is independent of their effects on LDL or HDL[16]. This is especially true for the diabetic patient [16].

Despite advancements in treating dyslipidemia, there is still inadequate treatment in many cases, and a significant number of patients are not screened for factors beyond total cholesterol, LDL, HDL, and triglycerides. The statins that block cholesterol synthesis and appear to have additional anti inflammatory actions related to the atherogenic processes provide limited effects[17]. In the future, more patients are likely to be prescribed multiple drug regimens for dyslipidemia. While primary-care physicians will predominantly handle the management, endocrinologists can have a specific role in challenging cases or those with unusual phenotypes that are difficult to control using standard regimens. As with obesity, it is also remembered that hypothyroidism itself can result in elevations in LDL[18,19]. Cushing"s syndrome can also be associated with lipid abnormalities, and clinicians need to look for these conditions when appropriate [20].

E. Thyroid disease

Both hypothyroidism and hyperthyroidism have deleterious effects on the cardiovascular system [18, 19,21,22]. Hypothyroidism can result in elevated plasma LDL levels, hypertension, and diminished cardiac contractility, exacerbating heart failure. Hyperthyroidism, on the other hand, may cause hypertension and various cardiac abnormalities, including atrial arrhythmias like atrial fibrillation. It can also precipitate or worsen angina pectoris, potentially leading to myocardial infarction. Additionally, hyperthyroidism is associated with the development of heart failure. Thus, for these and other reasons, management of these disorders is important. In addition, up to 15% of women over the age of 60 have subclinical hypothyroidism, defined as abnormally elevated plasma thyroid-stimulating hormone levels with normal T_4 levels [23,24]. Although the literature is controversial, some studies suggest that this condition leads to elevations of LDL [25], and most endocrinologists feel that these conditions need to be treated as well, especially if there is evidence for dyslipidemia. Furthermore, subclinical hyperthyroidism, defined as a suppressed plasma level of thyroid-stimulating hormone and normal plasma T_4 levels may be associated with an increased incidence of atrial fibrillation[22]. Endocrinologists play a crucial role in managing disorders like hypothyroidism. While routine cases are relatively straightforward, complexities arise in instances such as managing hypothyroidism in the elderly, where replacement therapy needs gradual initiation, and in patients with subclinical disease where criteria for therapy initiation are less clear. Managing hyperthyroidism is inherently more complex. With overt disease, there is the choice between medical therapy and radioactive iodine or surgery. Therapy in patients who have heart failure or severe atherosclerosis is more complicated. The majority of patients with subclinical disease won't progress to overt hyperthyroidism, and the criteria for initiating therapy are more complicated. These cases can benefit from the special role played by the endocrinologist.

F. Cushing's syndrome

The overt form of Cushing"s syndrome is easily recognizable; however, one of us (J.D.B.) recalls, as a medical student, a case where the presentation of Cushing"s disease was initially missed, being mistaken for malignant hypertension. Nevertheless, more and more we are diagnosing this condition at early stages in which the clinical presentation is more subtle[26]. Almost all patients with spontaneous Cushing"s syndrome have hypertension[27], and, as stated above, these patients may also be obese. Despite significant advancements in diagnostic and therapeutic approaches, identifying mild

Cushing"s syndrome remains among the most challenging tasks for clinical endocrinologists. The endocrinologist serves as a valuable resource in deciphering the complex array of clues to diagnose the syndrome and determine the localization of the abnormally functioning tissue (adrenal, pituitary, ectopic).

G. Diabetes and cardiovascular disease

Cardiovascular disease is particularly prevalent in the diabetic patient [16,27]. Recent studies suggest increased stringency in regulating blood pressure and lipoprotein levels for patients with this disorder. Blockers of the renin-angiotensin system are particularly effective in preventing the progression of renal disease. Endocrinologists, traditionally focused on diabetes treatment, are now increasingly involved in managing cardiovascular risk factors, including blood pressure and hyperlipidemia, due to the need for stricter control in this disorder. It's essential to address hyper-triglyceridemia, an independent risk factor for atherosclerosis, especially in diabetic patients, requiring established regimens for control.

H. Hormone Replacement Therapy

Indeed, as mentioned earlier, both estrogens and androgens exert significant effects on the cardiovascular system. As outlined by Drs. Liu, Death, and Handelsman discuss whether deficiency of both of these classes of hormones is being discussed in this Endocrine reviews issue the risk of developing cardiovascular complications increases after menopause and andropause. While there is consensus among most clinicians regarding the indication for androgen replacement in men with testosterone deficiency, the initiation of estrogen replacement therapy remains a topic of controversy. Recent studies with estrogen and progestin replacement in postmenopausal women showed no cardiovascular risk improvement, and trials with estrogen alone are ongoing. Given the complex actions of estrogens on various tissues, the decision to initiate estrogen replacement therapy has become more intricate. Endocrinologists play a valuable role in advising patients and collaborating with other clinicians in these situations.

I. NAFLD

NAFLD, or non-alcoholic fatty liver disease, is characterized by hepatic steatosis in the absence of other causes for secondary hepatic fat accumulation. It stands as the most prevalent liver disorder in industrialized nations, with a prevalence ranging from 10 to 46% in the United States and a global range of 6 to 35% (median 20%).The diagnosis of NAFLD requires evidence (by imaging or histology) of hepatic steatosis and the exclusion of secondary causes of hepatic fat accumulation, including steatogenic medication (*e.g.* corticosteroids, methotrexate, amiodarone), viral infections (*e.g.* hepatitis C), or hereditary disorders (*e.g.* alpha-1 antitrypsin deficiency, Wilson"s disease); moreover, daily alcohol consumption must not exceed 30g for men and 20g for women.

Metabolic syndrome has a well-known risk factor like CVD (cardiovascular disease) and also in NAFLD patients, but NAFLD itself may be associated with CVD [28]- but the underlying mechanisms o NAFLD a link with CVD remain complex and involve a number of different pathways, including insulin resistance, endothelial dysfunction, fibrosis, and alterations in gut microbiota [29]

J. Uremic Cardiomyopathy

Patients with end-stage renal disease bear a substantial burden of cardiovascular disease, experiencing mortality rates from cardiovascular issues that are 15 to 30 times higher than the general population. Uremic cardiomyopathy is a classic manifestation characterized by diastolic dysfunction, myocardial fibrosis, and left ventricular hypertrophy in individuals with chronic kidney disease.

The prevalence of HF in patients with chronic kidney disease populations increases with age, is markedly more common in dialysis patients (prevalence: 31-36%) than in those with normal kidney uremic cardiomyopathy, with a prevalence ranging from 1.8 to 4.4%, is inversely proportional to the estimated glomerular filtration rate. This condition can manifest due to hemodynamic overload (both pressure and volume) and a systemic uremic state. Alterations in mineral metabolism, coronary microvascular dysfunction, and the accumulation of substances such as endothelin, parathyroid hormone, tumor necrosis factor alpha, interleukin-1<unk> and interleukin-6, endogenous cardiotonic steroids such as cardenolides. (oubain and digoxin) and bufadienolides (marinobufagenin and proscillaridin A) contribute to the pathogenesis of uremic cardiomyopathy [30] .

K. HFpEF

Several studies estimate that as many as 40-60% of patients with heart failure (HF) have a normal (≥50%)

LVEF [31]. The proportion of patients with HF who have HFpEF is higher in older adults and appears to be increasing by about 1% annually relative to that of HF with reduced ejection fraction (HFrEF) [32] . In heart failure with preserved ejection fraction (HFpEF), the majority of patients exhibit normal left ventricular volumes and show signs of diastolic dysfunction, such as elevated filling pressures at rest or during exertion.

The pathophysiological understanding of HFpEF is still limited. Recent reports have shown that many HFpEF patients exhibit signs of non-resolving inflammation, endothelial dysfunction, insulin resistance, hyperlipidemia, and multiorgan defects [33]. At the cellular level, patients with heart failure with preserved ejection fraction (HFpEF) often exhibit thicker and shorter cardiomyocytes compared to normal cells. There is an increase in collagen content, and recent histologic assessments have identified reductions in myocardial capillary density along with lymphatic dysfunction. [34]. Furthermore, substantial evidence indicates that obesity-related HFpEF may result from increased mineralocorticoid signaling, adipokines imbalance, and neprilysin overactivity [35] .

Conclusion

In summary, historical and recent discoveries revealed the importance of the endocrine function of the heart. Studies of various heart-derived hormones highlighted their shared fundamental features and pointed to a unified endocrine mechanism that the heart uses to communicate with the rest of the body. The answers to many exciting basic and translational questions will further advance the field of cardiac endocrinology.

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Clinical Overview

Population Screening for Breast Cancer

Shah Alam Sarkar[1], Rezaul Islam[2]

Abstract

Screening female population for breast cancer has a significant impact on survival rate. The quality of this screening service provided by the UK and other developed countries are improving continually, with increased sensitivity reducing rates of non-surgical diagnoses. The results of screening have exceeded the initial expectations of the service, where an improvement in disease-specific survival of 25% was anticipated. Virtually, to reduce the mortality of breast cancer up to 30-40%. We recommend that National Breast Cancer Screening Program should be launched in the developing nations also to rip benefits of screening.

Keywords: Breast cancer; Screening; Mammography.

Introduction

Breast cancer remains a major health burden among women, worldwide. Reportedly, breast cancer remains the most common cancer both in developed and developing countries being the principal cause of cancer death among the women, globally.[1]

Randomized controlled trials and meta-analysis have shown that screening by mammography can significantly reduce mortality and morbidity from breast cancer.[2] Data from national cancer institute in Bangladesh shows that breast cancer remains at top (23%) of the list of cancer among women.[3]

The highest incidence of breast cancer is seen in Northern and Western Europe, USA, Australia and New Zealand (about 95 per 100 000). For this reason, these countries have adopted nationwide breast cancer screening program.

There are some countries which have intermediate incidence. Screening program in these countries are at the stage of evolution or in pilot study. In most of the Asian and African countries the incidence is lowest (about 22 per 100 000). Bangladesh falls in this category. Because of the low incidence of breast cancer and of limited resources launching any screening program is not feasible for country like Bangladesh-which should be tried for.

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Brief History of Screening of Breast Cancer (CA)

In 1913 by a German surgeon Albert Solomon 1st performed mammogram by in his paper "Contributions to the Pathology in Clinical Medicine of Breast Cancer", demonstrating existence of different types of breast CA and spreading those out through axillary lymph nodes [4].

In 1927, German surgeons Otto Kleinschmidt and Erwin Payr 1st described role of mammography in early detection of breast CA [5] followed by another author who established radiology to assess breast tumors in 1932.[6]

Thus in 1976 modern mammography was 1st officially recommended by American Cancer Society (ACS) and then mammogram emerged as the most reliable method to screen out breast CA.[7] After that mammography and breast imaging has been progressing with potential applications successively towards DBT (Digital Breast Tomosynthesis, Contrast-Enhanced Mammography (CEM), Breast MRI and Breast Ultrasound for effectively screening breast CA.

Methodology and Bias

There are 3 major types of bias which must be considered when assessing a screening program:

i) lead-time bias,

ii) length-time bias, and,

iii) selection bias.

These aforementioned potential biases in evolution of screening trials make it unwise to use prognostic factor (number of tumors detected or length of survival following diagnosis) as measures of screening.

That is why, the „gold standard" method of evaluating screening is by randomized controlled clinical trial using breast cancer mortality as the end point.

The World Health Organization"s 10 principles of screening-[8]

1. The condition sought should be an important health problem
2. There should be an accepted treatment for patients with recognized disease
3. Facilities for diagnosis and treatment should be available
4. There should be a recognizable latent or early symptomatic stage
5. There should be a suitable test or examination
6. The test should be acceptable to the population
7. The natural history of the condition, including development from latent to declared disease, should be adequately understood
8. There should be an agreed policy on whom to treat as patients
9. The cost of case-findings (including diagnosis and treatment of patients diagnosed) should be economically balanced in relation to possible expenditure on medical care as a whole
10. Case finding should be a continuing process and not a 'once and for all' project

Modalities of screening

Clinical breast examination (CBE), Breast self-examination (BSE), Ultrasonography, Mammography, MRI, Nipple aspirate and Tissue sampling, all were tried as methods of population screening. But mammography was found to have highest sensitivity and specify in detection of cancer. Its overall sensitivity is about 80-90% and specificity are about 95%.

Reduction of Mortality

Other findings showed that screening was associated with reduction of breast cancer specific mortality of about 30-40%.[9] Five-year survival of screen detected cancer was about 96.5% compared to 70% for symptomatic cancer. Women aged 50-74 years get more benefit compared to women between 40 to 49 years.[10]

The UK breast screening program is restricted to women aged 50–70 years (see below). Women are invited to attend for two-view mammography every three years. Further assessment may be required if an abnormality is noted i.e. further mammographic views of the area (focal compression views); high-resolution ultrasound and percutaneous or surgical excision biopsy may be done if the abnormality is significant.

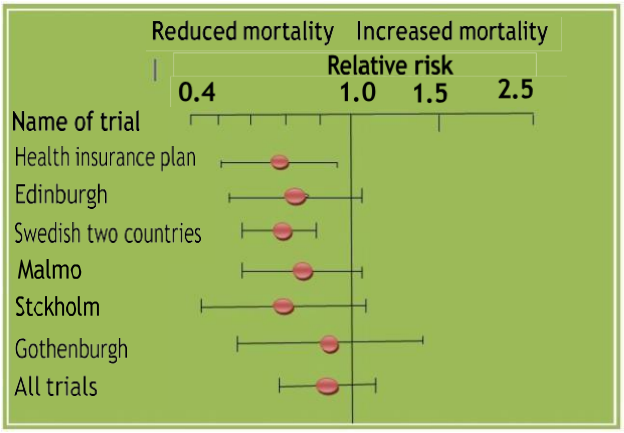

Figure-1: Relative risk of mortality in breast cancer in women aged 50-74 years invited for screening compared to controls Meta-analysis 1995 0.74 (CI 95%), (D 0.66-0.83)

Disadvantages of screening

Anxiety, additional intervention, radiation exposure, over-diagnosis are adverse effects of screening.

Radiation Exposure:

The radiation dose of the mammogram may contribute to the development of some cancers, although the risk of such low dose radiation exposure is extremely low.

A single mammogram exposure of 2 mGy may cause 4.5/million cases of breast cancer in 40–49-year-olds and 1.5/million in 50–59-year-olds.[11]

Overdiagnosis:

A significant proportion of screen-detected cancers would not have become symptomatic during a woman"s lifetime; this rate of overdiagnosis is 10–40%.[12] There is a 3.5 times greater incidence of diagnosis of in situ disease in women aged 66–79 who have screening compared to those who do not. [13]

Mammography

Mammography is currently the best available population-based method to detect the breast cancer of women of average risk. Its sensitivity and specify is highest

among all the available tests. Its overall sensitivity is about 80-90% and specify is up to 95%.[14] Mammography is nothing but plain x-ray of the breast when it is sandwiched between two plates (fig-2). Medio-lateral and cranio-caudal (Two views) views are taken.

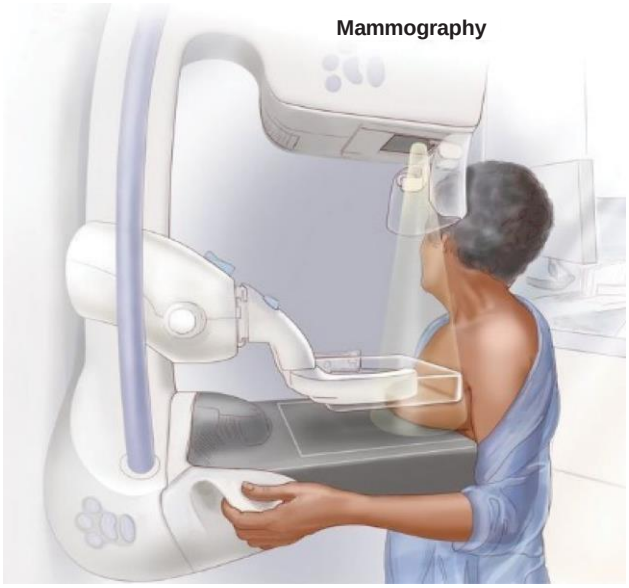

Figure-2 : Procedure of mammography

Mammographic features of breast cancer

A. Dense opacity (Figure-3)
B. Microcalcification (Figure-4)
C. Irregular outline with spiculation (Figure-5)
D. Skin tethering or thickening (Figure-6)
E. Architectural distortion of the breast (Figure-7)

Involved lymph nodes can sometimes be seen. Micro-calcification alone is features of DICS (ductal carcinoma in situ).

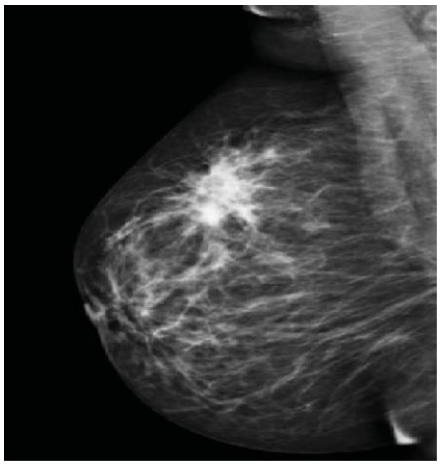

Figure-3: Dense opacity

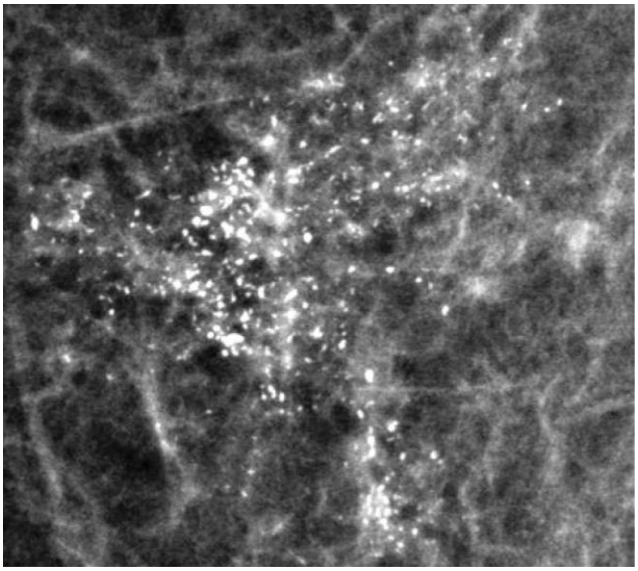

Figure-4: Microcalcification

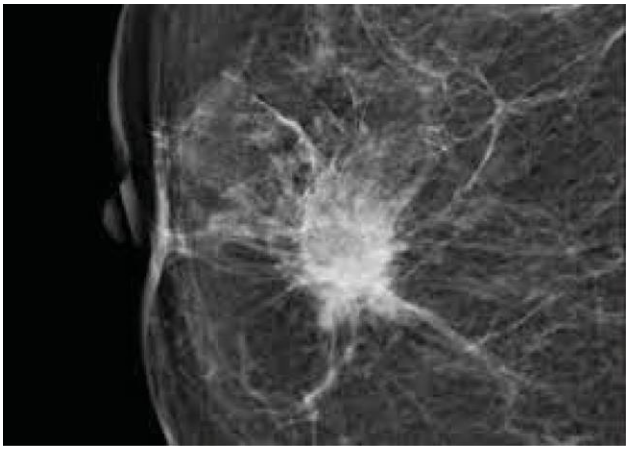

Figure-5: Spiculation

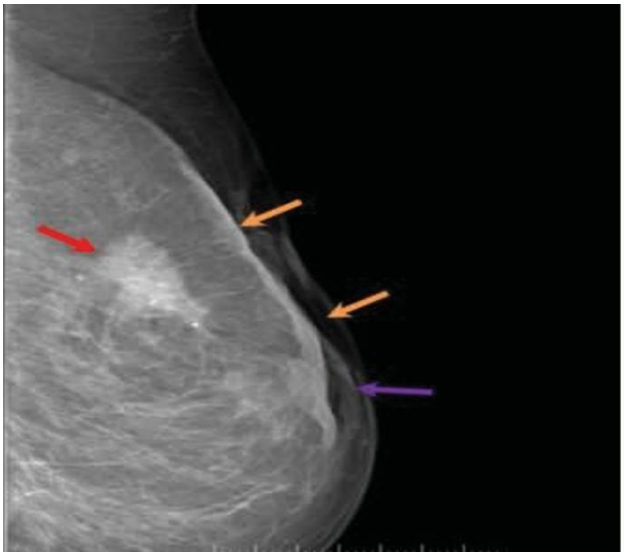

Figure-6: Skin tethering or thickening

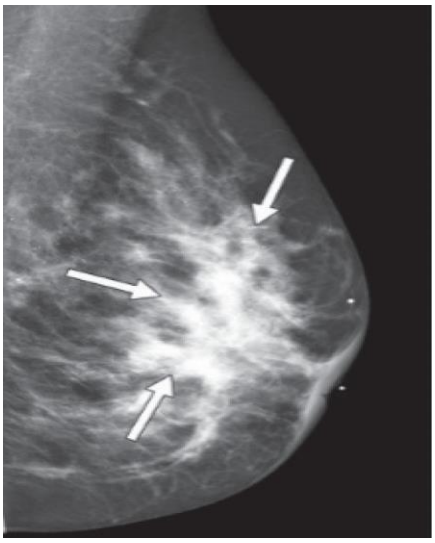

Figure-7: loss of normal architecture

Further workup

If an abnormality is noted on mammogram, further mammographic views of the area (focal compression views), high-resolution ultrasound and percutaneous or surgical excision biopsy are done. The rate of breast conservation is higher due to the smaller average size of screen detected cancers, which has obvious advantages in terms of body image and quality of life.

Table-1: UK breast cancer screening audit- 2005

	Screen detected cancer %	Symptomatic cancer %
Tumor grade- 1	31	15
Tumor grade-2	49	42
Tumor grade -3	18	30
Nottingham prognostic index	61	41
Rate of breast conservation	63	52
Rate of Mastectomy	27	48

Results of screening

55 invasive cancers are detected for every 10 000 women screened in UK National Breast cancer Screening program (NBCSP). In the period 2004-2005, despite a rising incidence of breast cancer in the UK, mortality from breast cancer fell by 30%. Of this 6% are thought to be attributable to National Breast Cancer Screening Program (NBCSP).15 (Table-1) Other factors which contributed largely to mortality reduction is improvement in treatment of breast cancer by multidisciplinary approach, routine use of systemic chemotherapy and adjuvant treatments.[16]

Current guidelines

U.S. Preventive Services Task Force (USPSTF) issued a draft update to its mammogram recommendations, proposing that women at average risk of breast cancer start mammograms at age 40 and have a mammogram every other year.[17] Women of high-risk group should be screened with mammography or MRI once in every year starting from age 25. Criteria of High risk is family history of breast cancer (any first degree relative have had breast cancer), presence of BRCA-1 or BRCA-2 gene, has had radiation exposure.

Conclusion

The screening results have exceeded the service's initial estimates of an improvement in disease-specific survival. Reduction of mortality from breast cancer can be achieved only by screening and continuous improvement on treatment. National Breast Cancer Screening Program should be implemented in emerging nations to reap the benefits of screening.

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Case Report

Transient neonatal diabetes in a very small sick newborn: A case Report

Shaifa Lubna Mili[1], Nusrat Jahan[2], Subir De[3], Navila Ferdous[4], Sabina Yeasmin[5], M.A Mannan[6]

Abstract

Hyperglycemia in neonatal period is a common metabolic disorder, especially seen in preterm low birth weight and critically ill newborns. The estimated incidence of this condition is around 45%–80%. But Neonatal diabetes mellitus (NDM)is a rare neonatal disease, which has an incidence of approximately 1 in 90,000–160,000 neonates worldwide. Herein we report an extreme preterm, extreme low birth weight, male neonate with transient neonatal diabetes mellitus who was treated with intravenous insulin initially and then subcutaneous insulin Glargine. An adequate glycemia was achieved at 3 weeks of life.

Key words: Transient neonatal diabetes, very small sick newborn

Introduction

Blood glucose supply and metabolism has a significant importance for growth and normal brain development in the fetus and newborn. Abnormality in it can result in hypo or hyperglycemia. Neonatal hyperglycemia is a common metabolic disorder found in NICU Usually seen in preterm low birth weight and critically ill newborns[1]. The estimated incidence of this condition is around 45%–80%[2,3]. But Neonatal diabetes mellitus (NDM) is a rare disease of newborn, with an approximate incidence of 1 in 90,000–160,000 newborns worldwide[4]. Hyperglycemia in neonate is common on 3 to 5th day of birth, but it is unusual for it to persist beyond 10 days. Premature infants are more prone to develop hyperglycemia because they lack adequate insulin secretion from the pancreas and some of them exhibit insulin- resistance[4,5].

NDM can be either transient or permanent. Transient NDM (TNDM) comprises about 50% of all NDM cases; this persists for a median of 12 weeks and usually resolves by 18 months of age. However, about 50% of TNDM cases relapse in late childhood or adolescence. But permanent NDM (PNDM) cases require lifelong medical treatment and the disease does not resolve[4,5,6]. The neonates with NDM are usually born before date, small for gestational age or intrauterine growth retarded and may present with reluctant to feed, signs of dehydration, weight loss, and glucosuria with or without ketoacidosis or ketonuria[1].

Herein we report an extreme preterm, extreme low birth weight, male neonate with transient neonatal diabetes mellitus who presented with respiratory distress immediately after birth and then developed persistent hyperglycemia and glycosuria at 7 days of life. The baby was treated as per NICU protocol. Hyperglycemia was treated with intravenous insulin initially and then subcutaneous insulin Glargine. An adequate glycemia was ensured at 3 weeks of life.

Case Presentation

B/O Nusrat Jahan, a male neonate was delivered by a 26-year-old mother at ad-Din Medical College & Hospital,

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who was extremely preterm (27+2 weeks of gestation), extremely low birth weight, and appropriate for his gestational age. The mother had no prior medical history of systemic sickness and had received appropriate prenatal treatment. Neither consanguinity nor a major medical history of diabetes existed in his family. The newborn was active and let out a spontaneous cry as soon as it was born. His Apgar scores were 8 at 1 minute and 10 at 5 minutes. His measurements at birth were 930 g (3rd–5th percentile), 24 cm (10th–25th percentile), and 31 cm (10th–25th percentile) for weight, length, and head circumference, respectively.

As he exhibited extreme preterm, extreme low birth weight, he was admitted to our neonatal intensive care unit for further evaluation. After several hours of admission, he developed Respiratory distress (grunting, tachypnoea, desaturation, cyanosis). CXR was done showing ground glass shadowing with air bronchogram. We diagnosed the case as respiratory distress syndrome and was treated with respiratory support (NIPPV) and other supportive managements. The initial blood glucose level was 4.2 mmol/ L. Following 3 days baby's clinical condition improved, baby was shifted from NIPPV to LFNC, developed neonatal jaundice and was treated with phototherapy. ECHO revealed a small PDA and was treated accordingly. On day 7 we observed one episode of hyperglycemia (11.3mmol/L). On that day neonate was getting IVF 5% dextrose with electrolytes, GIR was 4.9 mg/kg/min, urine output was 4.2ml/kg/hr and vital signs were normal. We monitored blood glucose 3 hourly and rest of readings were normal. On the following day (day 8) blood glucose level was rising (12- 24 mmol/L). On that day GIR was 6.3mg/kg/min. We have done septic work up, VBG revealed pH 7.26, PCO2 32.4, HCO3 14.3, BE -11.4. We continued treatment with IVF: 5% dextrose with electrolytes, added Injectable antibiotics and gave 2 shots of insulin bolus 0.1 U/kg. Blood glucose level falls in normal range after 2 boluses.

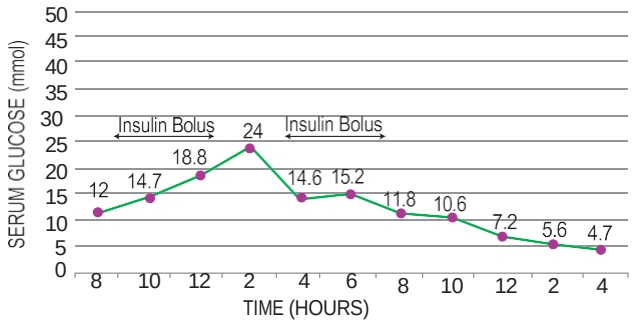

Figure-1: Rising of Blood glucose level

From day 9 the baby developed persistent hyperglycemia (11-22.5 mmol/L). We have rechecked IVF and other medications. GIR was 5.9mg/kg/min. Septic work up revealed nothing significant. So, we started continuous intravenous regular insulin infusion (0.1units/kg/hr) according to hyperglycemia treatment protocol but he remained hyperglycemic for the next several days.

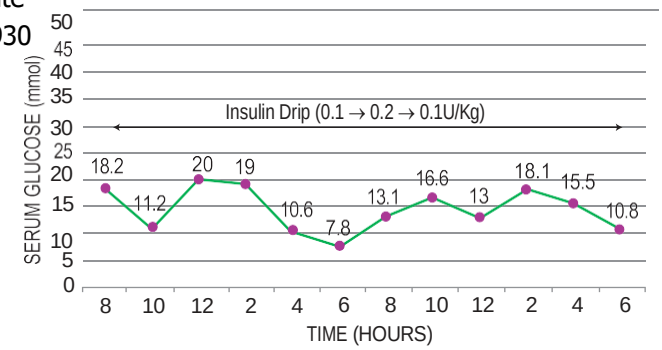

Figure-2: Fluctuation of Blood glucose level

During that period, he developed polyuria and lost 25% of birth wt. We considered the possibility of NDM and scheduled additional laboratory tests. His baseline biochemistry, including serum blood urea nitrogen 15.3 mg/dL, creatinine 0.9 mg/dL, aspartate aminotransferase 38 U/L, alanine aminotransferase 16 U/L and complete blood count reports were within the normal ranges. Urinalysis revealed a 4+ glucose level but no ketones. Moreover, no sign of ketoacidosis was found. Ultrasonography of the whole abdomen revealed no structural abnormalities.

As there was persistent hyperglycemia despite continuous intravenous regular insulin infusion. We decided to stop continuous infusion rather than giving insulin Glargine, a long-acting insulin subcutaneously. After giving 1st shot of insulin Glargine (0.45 U/kg/ dose) baby developed hypoglycemia (1.9 mmol/L) which was treated with 10% dextrose bolus. On the following day we again gave insulin Glargine and repetition of same events occurred.

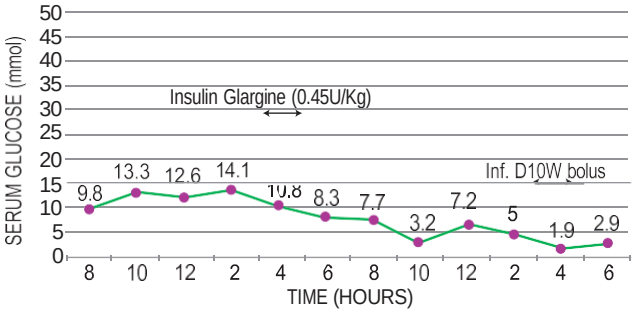

Figure-3: Normalization of Blood glucose level after Insulin Glargine

But from day 18 blood glucose level became in normal range (5.3- 8.4mmol/L). So, we stopped giving insulin.

As the neonate obtained adequate glycemia (5.6-8.9 mmol/L) with expected weight, he was discharged on PMA 39^{+4} weeks with weight: 1300 gm on enteral feedings without any insulin or hypoglycemic treatment.

Discussion

Neonatal hyperglycemia is a common metabolic disorder, especially seen in low birth weight preterm and critically ill newborns[1]. The definition of hyperglycemia is uncertain. For practical management, a BG value of 3.88–8.33 mmol/L (70–150 mg/dl) is considered as a safe range[7]. In PT babies, BG up to 10 mmol/L is commonly observed with parenteral glucose administration. This may not require any treatment and would only need close glucose monitoring. However, BG >10–11.1 mmol/L are of great concern in neonates as this can lead to complications[8]. When a newborn experiences prolonged hyperglycemia that lasts longer than two weeks and necessitates insulin treatment —NDM is diagnosed; typically occurs due to abnormalities in insulin secretion and beta-cell development[9]. Intrauterine growth retardation, volume depletion, severe hyperglycemia, glycosuria, polyuria, ketonuria and ketoacidosis are typical symptoms of NDM. Permanent neonatal diabetes mellitus (PNDM) and transient neonatal diabetes mellitus (TNDM) are the two kinds of neonatal diabetes mellitus[1]. Gene mutations associated with the ATP-sensitive potassium channel are the main cause of PNDM. This subtype requires lifetime treatment and has no period of remission[10]. 50% of NDM instances are TNDM cases. In 90% of cases, TNDM is known to be caused by three mechanisms. The altered expression of genes on chromosome 6 is a component of all the mechanisms. The three methods are as follows: (1) imbalanced duplication of 6q24 on the paternal allele; (2) paternal uniparental disomy of chromosome 6 (UPD6pat); and (3) 6q24 maternal hypomethylation defect[1,10]. The TNDM course varies greatly. Throughout the first few weeks or months of life, permanent resolution takes place. A small percentage of patients may relapse into a permanent form of diabetes mellitus during their childhood or adolescence[1,10]. Insulin and oral sulfonylurea drugs are effective treatments for TNDM, and after a year, the condition spontaneously remits. However, a small percentage of patients experience relapses in adolescence and adulthood[1,10]. Later in life, 50% of patients with 6q24-related TNDM develop permanent diabetes mellitus[1]. Although PNDM is less prevalent than TNDM, therapy for it must be lifelong[10]. Early detection and management of newborn diabetes mellitus are important because proper management of hyperglycemia encourages appropriate weight gain and development. Our patient displayed TNDM; he was born before date, that is a common trait of NDM. His TNDM symptoms could not explained otherwise and Insulin Glargine, a subcutaneous long-acting insulin, proved to be an effective treatment. The only side effect we experienced was acute hypoglycemia.

In conclusion, we present a case of TNDM in a premature newborn who responded well to subcutaneous Insulin Glargine treatment. Numerous studies suggest that Glargine's release pattern— a true "peak-less" insulin— makes it most suited for managing type 1 diabetes in newborns and early infancy, when patients are frequently or continuously fed. Long term close surveillance (until adolescence) is needed with an emphasis on any relapses of diabetes.

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Case Report

Fate of a Primigravida Women with Acute Fatty Liver of Pregnancy (AFLP) Complicated with Multiorgan Dysfunction Syndrome (MODS): An Obstetric Emergency

Tania Noor[1], Fahmida Mozumder[2], Bonika Biswas[3], Laila Noor[4], Nila Akter Keya[5]

Abstract

Conditions of causing liver dysfunction, unique to pregnancy may often be difficult to establish the diagnosis. Failing to do so can result in unwanted complexities leading to higher morbidity or mortality both for mother and fetus. Hence, we have a case report of a 23-year-old disoriented, semi-conscious, deeply icteric, primigravid, 35 weeks 5 days twin pregnancy patient. She had complaints of severe abdominal pain, nausea and vomiting along with features of multiorgan dysfunction syndrome (MODS) due to Acute Fatty Liver of Pregnancy. Considering the patients history and clinical evidences, the differential diagnoses was "HELLP syndrome (Hemolysis, Elevated Liver Enzymes, and Low Platelets)" and "Acute Fatty Liver of Pregnancy (AFLP)". Though the commonly reported HELLP syndrome and uncommon AFLP often mimic each other, clinically, these differ largely in patho-physiological characteristics, quite distinctly. While diagnosis of HELLP syndrome usually based both on clinical and some essential investigations findings, diagnosis of AFLP is based on the clinical presentation itself in adjunct with clear cut compatible laboratory findings using Swansea criteria. Coincidentally, definitive management of both cases is termination of pregnancy. Hence immediate termination of pregnancy along with supportive treatment of liver failure is the main stay management for the optimal maternal and fetal outcome in AFLP, as globally reported.

Key words: Primigravida, Acute Fatty Liver of Pregnancy (AFLP), Multiorgan Dysfunction Syndrome (MODS).

Introduction

Acute fatty liver of pregnancy is a rare complication of pregnancy which may be a life-threatening condition due to micro vesicular infiltration of the liver by fat, leading to liver failure. It usually presents at 36 weeks of gestation, and risk factors include first pregnancy (primigravida), preeclampsia, multiple pregnancies, male fetuses (M:F ratio 3:1) and low BMI (<20 kg/m^2). [1]

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The approximate incidence of AFLP is 1: 7,000 to 1:20,000. [2] Conditions unique to pregnancy that cause liver dysfunction including intrahepatic cholestasis of pregnancy, pre-eclampsia, Hemolysis elevated liver enzymes and low platelet count (HELLP) syndrome and AFLP.

The earliest literature available on AFLP, dates back to 1940, as described by Sheehan as an, "Acute yellow atrophy of the liver".[3] Following this there have been many reported cases of the disease and its outcome. The hypothesis is, an abnormality in the metabolism of long chain fatty acids in the fetus, lead to an excess of fetal fatty acids entering the maternal circulation, resulting in their deposition in the maternal liver leading to hepatic failure, that can be repeated in future pregnancy. [4]

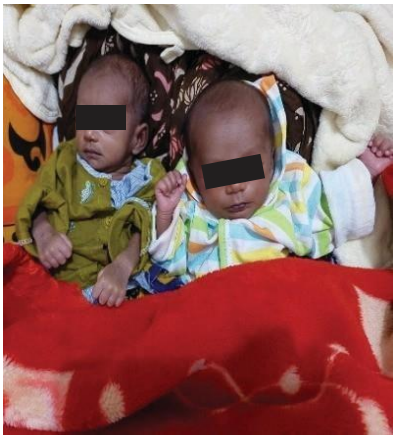
The Case:

A 23-year-old female (primigravida) admitted in obstetrics gynae admission ward at mid night with 35 weeks 5 days of twin pregnancy with abdominal pain, nausea and vomiting 10-12times for last 4 days but had no complain of itching. The patient had yellow discoloration of skin and sclera for the last 5 days, as reported.

Recent History

The patient was admitted into another nearby hospital 4 days before, as her condition got deteriorated, the patient was brought to our hospital for better management. She was on irregular antenatal checkup and her pregnancy remained uneventful up to 35 weeks.

Patient with AFLP



Newborn twins of AFLP patient

On admission

She had severe abdominal pain, sudden in onset, continuous in nature, did not radiate but relieve a bit using antispasmodic and she did not have any per-vaginal bleeding. Moreover, she had vomiting for10-12 times, non-projectile, contained food particles, non-bilious and not mixed with blood. Vomiting did not use to relieve her abdominal pain, though, complained of polyuria and polydipsia.

She neither had a history of rise in blood pressure, blurring of vision, nor headache, oliguria or edema. The patient had no history of taking paracetamol, aspirin, sodium valproate or any herbal medicine.

Physical examination

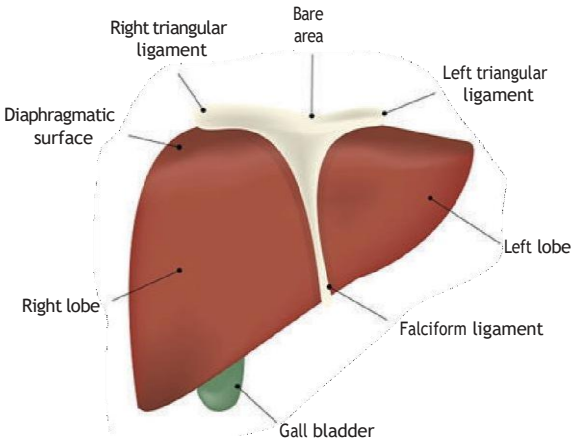
The patient was ill-looking, semi-conscious, and not oriented to person, place, and time. While her body build was below average, she was mildly anemic, deeply icteric, pulse rate 90 bpm, BP 130/80 mmHg with anti-hypertensive drug. Her body temperature was 98ºF and respiratory rate was 18 breaths/min and bedside urine albumin was +1.

On systemic examination, Abdomen was found uniformly enlarged. Symphysio-fundal height was around 36 weeks and revealed two fetuses with breech presentation on longitudinal lie. Abdomen was relaxed and non-tender. On auscultation, two fetal heart sounds were audible with normal range of 110bpmand 122bpm(approx.).

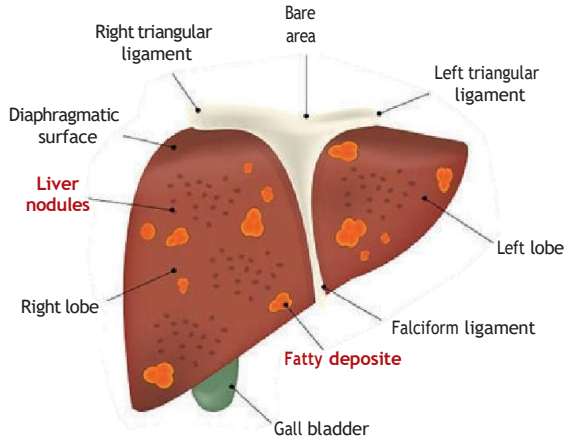
Examination of nervous system

Revealed signs of hepatic encephalopathy with impaired memory(apraxia), drowsiness, flapping tremor(asterixis), exaggerated tendon reflex (hyperreflexia) and extensor planter reflex (positive Babinski sign.)

Healthy Liver



Fatty Liver Disease



Laboratory Assessment

Investigations of Complete blood count revealed hemoglobin was; 10g/ dl, white blood cell count was; 17,000/cumm, and platelet count was; 1,80,000/cumm. Peripheral smear was negative for hemolysis and serum lactate dehydrogenase (S.LDH) level was 239 mg%. Liver function tests showed aspartate aminotransferase was; 210 U/l, alanine aminotransferase was; 136 U/l, total bilirubin was; 9.3 mg/dl, direct bilirubin was; 7.7 mg/dl, alkaline phosphatase was; 516 U/l, total protein was; 5g/dl, and albumin was; 2.5 g/dl.

Other biochemical

Revealed blood urea: 40 mg/dl, serum creatinine: 1.8 mg/dl, serum glucose: 60 mg/dl, and serum ammonia: 415 µmol/L. Coagulation profile revealed, prothrombin time of 60 seconds with international normalized ratio (INR) of 3.1, fibrinogen: 62 mg/dl, and fibrin degradation products (FDP): 360 µg/ml. Comb"s Test: Negative, S. Amylase: 93 U/L, S. Lipase: 59 U/L, RBS: 3.4 mmol/L. While urine analysis showed mild proteinuria, all serological tests, like; HBsAg,Anti HCV, Anti HAV IgM, Anti HEV IgM and HIV yielded negative findings.

Ultrasonography (USG)

Ultrasonography **(USG)** of pregnancy profile revealed two viable fetuses with breech presentation with bright echotexture of liver on USG of hepatobiliary system.

Based on the aforementioned through investigation, the final diagnoses that was established as, Primigravida with 35 weeks 5 days of twin pregnancy with acute fatty liver of pregnancy with hepatic encephalopathy with acute kidney injury (AKI).

Clinical Management

Though the patient developed coagulopathy, mode of delivery should have been normal vaginal delivery (NVD) but considering the patient's general condition and fetus presentation (both were breech) with unfavorable cervix, decision for urgent Lower segment caesarean section (LSCS) was taken. Coagulopathy was corrected by intravenous Injection Vitamin K (10mg) for 3 days; Fresh Frozen Plasma (FFP) 1unit and PRBC 1 unit was transfused preoperatively.

Counseling was done regarding complications of C-section with possible risk of excessive bleeding, as patient developed coagulopathy. C-section was performed under general anesthesia with prior arrangement of FFP (Fresh Frozen Plasma) and whole blood.

Surgical Management/ Operation note and subsequent steps taken

During operation bleeding was more than average. There were multiple oozing points in subcutaneous and sub rectal area with multiple rectus muscle haematoma were also present. After proper haemostasis three drain tube kept in situ (intraperitoneal, sub rectus and subcutaneous)to observe further hemorrhage. Intraoperatively, the patient received 1000ml crystalloids, 3 units of fresh frozen plasma (FFP), and 2 unit of whole blood through central venous line. To avoid PPH prophylactically condom catheterization was done.

Table-1 : Day wise Progress Report of Patient via Parameters of Blood Test

Parameters tests	Day Specific Progress of Treatment based on gradual Laboratory of Blood Parameters				
	(1st day of treatment) 24.12.22.	(3rd day of treatment) 26.12.22. „0" OPD	(4th day of treatment)2 27.12.22 1st OPD	(8th day of treatment) 31.12.22 5th OPD	(15th day of treatment) 7.1.23 12th OPD
S. ALPa	516	575	153	120	
S. ALTb	136	138	48	40	
S. Bilirubinc	9.3	11.7	11.3	9	3.89
INRd	3.1	3.2	1.2	1	
WBCe	17,000	28,400	21,000	11,000	8,300
S. Uric Acidf	7	9.1	6	-	
Total Platelet countg	1,80,000	1,56,000	1,20,000	1,40,000	1,77,000
S. Ammoniah		415			
S. Creatininei	1.8	2.89	2.81	1.32	0.8

a-S.ALP- Serum Alkaline phosphatase (ALP)
b-S.ALT- Serum Aminotransferase, alanine (ALT)
c-S Bilirubin – Serum Bilirubin:
d-INR-International normalized ratio
e-WBC-White blood cell count
f- S. URIC ACID- Serum Uric Acid
g- Total Platelet count
h- S.Ammonia- Serum Ammonia
i- S.Creatinine – Serum Creatinine

Though the patient"s vital remained stable, she was shifted to ICU for better and close monitoring and was put on broad-spectrum antibiotic and the newborn was transferred to NICU.

Therapeutic Modalities Instituted

During puerperal period, symptomatic treatments were going on simultaneously for jaundice, electrolyte imbalance, AKI and DIC. As the patient improved having moderate bleeding in 3 drain tubes, condom catheter was removed on 3rd post-operative day (POD) and all the 3 drain tubes were taken off on the 6th POD, as no further collection of blood in drain tube. The patient required intermittent dialysis for uremia and replacement of blood components to correct coagulopathy.

Notable Improved Evidence

Her bilirubin and liver enzymes started to decrease and platelets increased from day 10. She made a gradual recovery. Her liver and kidney function returned to normal on day 14. She was managed by 18 units of FFP, 5-unit whole blood and 1 unit apheresis throughout her stay in ICU.

She was shifted to ward from ICU on 12th POD and was under joint consultation with department of internal medicine. On 15th POD, wound dehiscence was observed and regular dressing of wound area was going on with coverage of broad-spectrum antibiotics: Injection Colistin which was the only sensitive antibiotics of her wound C/S. On 21st POD, secondary stitch was given and the patient was discharged home on 22nd POD with healthy twin babies.

Discussion

AFLP is an uncommon, but serious, condition that causes a pregnant women to develop a fatty liver. It is unpredictable and unpreventable, but requires immediate treatment to avoid life-threatening complications[6]

Pathogenesis is unknown but probably due to deficiency of 3-hydroxyacyl-CoA dehydrogenase (LCHAD) in the fetus. Maternal-fetal fatty acid metabolism is defective which leads to accumulation of unmetabolized medium and long chain fatty acids in maternal blood and hepatocytes, with deleterious effects on maternal hepatocytes[2].LCHAD deficiency is autosomal recessive and mothers are often found to be heterozygous for the affected mutation[5]

AFLP usually presents after 30 weeks, and often near term (35-36 week) with gradual onset of nausea, anorexia and malaise, severe vomiting, abdominal pain, jaundice (usually appears within 2weeks of the onset of symptoms), hypoglycemia, polyuria and polydipsia.[7]

Clinical signs include jaundice, abdominal tenderness, ascites, signs of hepatic encephalopathy, renal impairment, DIC.[8] Mild pre-eclampsia can be present but hypertension and proteinuria are usually mild. Confusion and altered mental status can be present.[9]

The diagnosis of AFLP is usually made clinically, based upon the presentation and compatible laboratory results, that includes:[10]

- Increased white blood cell count
- Raised aminotransferases (5 to 10 times more than the normal range)
- Increased serum bilirubin level
- Elevated prothrombin time
- Increased uric acid level
- Increased ammonia level
- Decrease blood glucose level
- Low fibrinogen

MRI/CT/USG: **Hepatic steatosis**, the liver may appear bright but normal, fat is micro-vesicular

CT: **Decreased attenuation** (fatty infiltration)

Liver biopsy shows fatty change on electrone microscope:

Gold standard for diagnosis *(Not always necessary or practical in the presence of coagulopathy)*

According to the **Swansea criteria**[11] for the diagnosis of acute fatty liver of pregnancy, **six or more** of the following findings are required in the absence of another cause

Clinical signs[10]

- Vomiting
- Abdominal pain
- Polydipsia/polyuria
- Encephalopathy

Biochemical

Hepatic [12]

- Elevated bilirubin > 14 µmol/l
- Elevated transaminases (AST or ALT) > 42 iu/l
- Elevated ammonia > 47 µmol/l

Renal[13]

- Creatinine > 150 mmol/l or 2.2 mg/dl
- Elevated urate > 340 µmol/l

Endocrine

- Hypoglycemia < 4 mmol/l

Hematological

- Leukocytosis >11x109/L;
- Prothrombin time >14 sec or APPT> 34 sec.[9]

Radiological

Bright liver on ultrasound scan and, micro vesicular steatosis on liver biopsy, etc[14]

Treatment

Treatment is immediate delivery of fetus and supportive treatment of other conditions. Other treatment modalities such as plasmapheresis and the use of activated protein C have been practiced in specialized centers.

Complications include

DIC, Hepatic encephalopathy, Acute Kidney injury, Pancreatitis, Hypoglycemia[14]

Recurrence

As Recurrences are high up to 10-20%, monitoring of liver function is commonly done as available tool of diagnosis, particularly likely in women who are heterozygous for disorders of fatty acid oxidation. [15]

Limitations

Limitations of our case report are centered in:

Could not study genetic issues in pregnant women with liver dysfunction and we can"t confirm AFL by doing liver biopsy. But this is either due to unavailability of the following tests in Bangladesh and/or huge cost involvement in these genetic issues, like association of MAT liver dysfunction & recessively inherited **FAO** (fatty acid oxidation) disorders in fetus, mitochondrial trifunctional protein (MTP) catalyzes. We also could not reveal the myths with human defects in MTP complex caused either with isolated LCHAD (long chain 3-hydroxyacyl-CoA dehydrogenase (**LCHAD**) deficiency or complete MTP deficiency with markedly reduced FAO activity.

And, we could not check if our patient carried fetus with MTP defects being at higher risk of developing liver dysfunction, like: AFLP and HELLP syndrome.

Conclusion

AFLP is a highly life-threatening hepatic disease occurring during the last trimester of pregnancy and early puerperium. It is rare, but remain potentially fatal condition mortality & fetal mortality rate 7-18% respectively. The recognition of high-risk factors is helpful for the prevention and management of AFLP. Early diagnosis; prompt delivery; and multidisciplinary supportive care, blood transfusion, and the ICU have resulted in improved maternal mortality, which our findings (case report) yielded. It is also necessary to observe the patient after delivery to ensure better health of the mother and the child.

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News

Strategies for Reducing the Risks of Surgical Complications of Endourology

Name of the Presenter : Prof. Dr. Afiquor Rahman

Designation : Professor

Department : Urology, Ad-din Women's Medical College.
And, Adviser, Medical Colleges, Ad-din Foundation

Type of Presentation : Seminar Presentation (Endourology related article)

Presented at : 3rd SAUS Congress of SAARC-2023

Date : 13-17 November, 2023

Venue : Colombo, Sri Lanka

News

Prevalence of Seropositivity of Hepatitis-B and Hepatitis-C Viruses among Bangladeshi Blood Donors in Tertiary Care Hospital

Name of the Presenter : Prof.Dr. Akmat Ali

Designation : Professor and Head

Department : Hepatology, Ad-din Women's Medical College.

Type of Presentation : Poster presentation (Original article)

Presented at : Asian Pacific Digestive Week (APDW)

Date : 6-9 December, 2023

Venue : Bangkok, Thailand

News

Therapeutic use of Platelet Rich Plasma (PRP) in orthopedic & spine disorders – Our Experiences

Name of the Presenter : Prof. Dr. Shahidul Islam

Designation : Professor and Head

Department : Orthopedics and Spine Surgery

Type of Presentation : Poster presentation (PRP related article)

Presented at : Spine Week, 2023

Date : 2nd May, 2023

Venue : Melbourne, Australia

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