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Article

Prevalence of gestational diabetes among the women attending the OPD of a selected tertiary level hospital in Bangladesh

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Abstract: Diabetes is a serious and growing global epidemic affecting people more in developing countries than developed countries, and is particularly devastating when triggered during pregnancy. Women with GDM are at increased risk of developing type 2 diabetes mellitus after pregnancy, while their offspring are prone to develop childhood obesity with type 2 diabetes in later life. This study was aimed to estimate the prevalence of gestational diabetes in Bangladeshi women. A descriptive cross-sectional study was carried out to estimate the prevalence of Gestational Diabetes among the pregnant women attending the OPD of BIRDEM Hospital**.** The study was conducted from January 2013 to April 2013. A non-probability purposive sampling technique was used. The data was collected using pre-tested self-administered semi-structured questionnaire and collected data was analyzed using SPSS 22.0 version. The finding of this study shows that, 42.3% of the respondents were in the age group 30-34 years and the mean age of the respondents was 24.4 (±4.94) years. The majority of the respondents (68.2%) were Muslim and it was also seen that 46.9% of the respondents had HSC level of education. More than half (65.9%) of the respondents were housewives and about 82.9% were from nuclear family. About 47.3% of the respondents had positive family history of hypertension and 34.4% had diabetes. More than half (57.7%) of the respondents did not maintain diabetic diet and 23.6% of the respondents had attended GDM program. The prevalence of gestational diabetes is 35.1%. There is need of appropriate intervention to control GDM and also risk indicator modifications in order to avoid complication regarding to mother and child.

Keywords: diabetes; gestational diabetes mellitus; antenatal care; nurses; patients

1. Introduction

Gestational diabetes mellitus (GDM) is defined as any degree of glucose intolerance with onset or first recognition during pregnancy (Metzger *et al*., 1998). This definition applies irrespective of the form of treatment or whether the diabetes persists after the pregnancy. It is the most common medical complication and metabolic disorder of pregnancy (Carr *et al*., 1998).

Approximately 4% of all pregnancies are complicated by GDM while the prevalence may range from 1–14% of all pregnancies depending on the population and the method of screening (Mumtaz, 2000). Gestational diabetes mellitus (GDM) is one of the maximum not unusual medical headaches in being pregnant and impacts an expected 14% of pregnancies, or one in each seven births globally (Nanditha *et al*., 2016). Women with GDM and their offspring are at extended danger of each quick- and longer-time period headaches, including, for mothers, later improvement of kind 2 diabetes, and for offspring, improved lifelong dangers of growing obesity,

kind 2 diabetes, and metabolic syndrome (Landon *et al*., 2009). The damaging intrauterine environment reasons epigenetic changes in the fetus which can make contributions to metabolic problems, the so-called vicious cycle of diabetes (Koletzko *et al*., 2014).

The main purpose of identifying GDM is to detect women at risk of adverse prenatal outcomes. There is evidence to show that women who are intensively treated during pregnancy can achieve near normal rates of macrodome. Correct diagnosis of this condition is important because it requires dietary control and pharmacological intervention as well as close monitoring of the pregnancy and the foetus (Langer *et al*., 1994). The modern definition of GDM turned into released for the duration of the 'Fourth worldwide Workshop-convention on Gestational Diabetes' in 1998. GDM is defined as glucose intolerance of various diploma of severity with onset or first recognition during being pregnant (Kuhi *et al*., 2002).

Women with GDM are at improved hazard of growing type 2 diabetes mellitus after being pregnant, while their offspring are vulnerable to increase early life obesity with type 2 diabetes in later life. Women recognized with GDM who had gestational weight benefit above the IOM recommendations have higher hazard of unwanted outcomes, which include preterm shipping, having macrocosmic neonates, and cesarean delivery (Freinkel *et al*., 1985).

Girls with GDM are at increased chance of developing type 2 diabetes mellitus after being pregnant, while their offspring are susceptible to develop formative years obesity with kind 2 diabetes in later life. Women identified with GDM who had gestational weight gain above the IOM guidelines have higher chance of undesirable consequences, consisting of preterm delivery, having macrocosmic neonates, and cesarean shipping (Weiss *et al*., 1988).

Women who gained beneath recommendations are much more likely to stay on weight loss plan manage but have small for gestational age neonates. Maternal adiposity fatty acid binding protein (AFABP) concentrations are appreciably accelerated in GDM. Raised GGT degree in an unbiased chance issue for GDM in excessive chance pregnant girls. Serum degrees of adiposity fatty acid binding protein are accelerated in gestational diabetes mellitus (Kautzky-Willer *et al*., 2001).

2. Materials and Methods

2.1. Research design and setting

A descriptive cross-sectional study was carried out during a period of January to April 2013 at OPD of BIRDEM Hospital, Dhaka Bangladesh. It encompasses medical critical care units, Operation Theater, gynecology, medicine, surgery ward, ICU and emergency units.

A total of 305 pregnant women were selected using non-probability purposive sampling technique. Pregnant women who were in the selected OPD during the period of this study and met the inclusion criteria were included. Those who were not available or decline to participate were excluded. The questionnaire used was pre-tested before starting the data collection.

All the women who had experienced gestational diabetes and willing to participate were included and those who didn't develop gestational diabetes or were sick during the study period were excluded for participation.

2.2. Data collection

Data were collected using self-administered semi-structured questionnaire for a period of three weeks. The sampled respondents were informed about the purpose of the study to obtain their consent and they were given clear instructions on how to fill the questionnaires. The questionnaires were given to all the women who were present during the period of study and consent to participate were obtained. Researcher issued the questionnaires to respondents and gave them time to fill, then hand them back before they leave for home from hospital. The researcher ensured that all the questionnaires were properly completed.

2.3. Method of data analysis

All the data collected were coded numerically and entered into the SPSS version 22.0 software program for analysis. A descriptive statistical analysis was used to calculate the frequencies and percentages. The descriptive analysis of data was presented in tables. A Pearson Chi-square test was also done, a *p-value* less than or 0.05 was considered statistically significant.

2.4. Ethical consideration

An official letter of request for access to official information was sent from ASA University of Bangladesh through Department of Public Health, to the Management of Bangladesh Institute of Research and Rehabilitation in Diabetes, Endocrine and Metabolic Disorders (BIRDEM) Dhaka Bangladesh. Oral request

were made to the women. This was done to inform them about the purpose and benefits of the study. The study was approved by Ethics Committee of the Faculty of Science & Engineering through Department of Public Health, ASA University Bangladesh and Dhaka, Bangladesh.

3. Results

3.1. Socio-demographic characteristics of the respondents

Table 1 shows that more than forty (42.3%) percent of the respondents were in the age group 30-34 years old and the mean age of the respondents was 24.4 years. The majority of the respondents (68.2%) were Muslim and the rest were non-Muslim. It was also seen that very closed to five-tenths (46.9%) respondents had HSC, followed by 31.1% SSC and 6.6% were illiterate. More than half (65.9%) of the respondents were housewives and around 80.7% of the respondents had 1 to 3 children. More than eight-tenths (82.9%) of them were from nuclear families and very few of the respondents (17.1%) were from joint families. The mean monthly income of the respondents was 16320.4 BDT.

Table 1. Socio-demographic characteristics of the respondents (n=305).

Variables	Frequency	Percentage (%)
Age (years)		
15-19	38	12.5
20-24	31	10.2
25-29	22	7.2
30-34	129	42.3
>35	85	27.9
Mean ± SD	24.4 ± 4.94	
Religion		
Muslim	208	68.2
Non-Muslim	97	31.8
Educational level		
Illiterate	20	6.6
Primary	14	4.6
S.S.C	95	31.1
H.S.C	143	46.9
Graduate	33	10.8
Occupation		
Housewife	201	65.9
Service holders	67	21.9
Others	37	12.1
Number of children		
1 to 3	246	80.7
4 to 6	13	4.3
>7	5	1.6
No child	41	13.4
Types of Family		
Nuclear family	253	82.9
Joint family	52	17.1
Family income (BDT)		
<5000	33	10.8
5000-10000	51	16.7
11000-15000	45	14.8
16000-20000	97	31.8
>20000	79	25.9
Mean	16320.4	

3.2. Diabetes related information

Table 2 shows that closed to fifty percent (47.3%) of the respondents had positive family history of hypertension and 34.4% had diabetes. More than half (57.7%) of the respondents did not exercise regularly and 72.1% of them mentioned they exercised regularly for about 30 minutes. More than half (57.7%) of the respondents did not maintain diabetic diet.

Table 2. Information related to diabetes (n=305).

Variables	Frequency	Percentage (%)
Family history of chronic disease		
Diabetes	105	34.4
Hypertension	144	47.3
Obesity	19	6.2
Others	37	12.1
Exercise regularly		
Yes	129	42.3
No	176	57.7
Duration of exercise (minutes)		
30	220	72.1
>30	85	27.9
Diabetic diet		
Yes	129	42.3
No	176	57.7

3.3. Gestational diabetes mellitus related information

Information related to gestational diabetes mellitus is shown in Table 3. The prevalence of gestational diabetes (GDM) was 35.1% among the women attending the OPD of BIRDEM Hospital**.** Almost all of the respondents 61.3% were not increased overweight during the pregnancy and rest of them 38.7% were increased overweight during the pregnancy. A great number of respondents (87.2%) had received antenatal checkup. About 52.1% of the respondents had normal delivery, 26.6% respondents had caesarean delivery and very few (7.9%) respondents had forceps delivery. The majority (54.4%) of the respondents had no previous obstetrical history, 19.4% had anti partum hemorrhage, 10.8% had placenta previa, 9.2% still birth and lastly 6.2% had low birth weight history, among the respondents (who had GDM) the maximum 73.8% had positive risk factors age greater than 25 years. About 23.6% respondents had attended GDM program and 18.4% respondents had taken role to prevent GDM (who had GDM).

Table 3. Information related to gestational diabetes mellitus (n=305).

Variables	Frequency	Percentage
Prevalence of GDM		
GDM	107	35.1
Non-GDM	198	64.9
Pregnancy times overweight		
Yes	118	38.7
No	187	61.3
Antenatal Care (ANC)		
Yes	266	87.2
No	39	12.8
Regular eating habits		
Betel nuts	85	27.9
Sleeping pill	36	11.8
Others	184	60.3
Mode of last delivery		
Normal delivery	159	52.1
Forceps delivery	24	7.9
Caesarean delivery	81	26.6
Others	41	13.4
Obstetrical previous history		
Placenta previa	33	10.8
Anti-partum hemorrhage	59	19.4
Still birth	28	9.2
Low birth weight	19	6.2
No	166	54.4
Diabetic symptoms in pregnancy		
Excessive thirst	115	37.7

Increased urination	80	26.2
Weakness	110	36.1
Risk factors of GDM		
Age greater than 25	225	73.8
Family or personal health history	80	26.2
Participation on GDM program		
Yes	72	23.6
No	233	76.4
Preventive measure		
Yes	56	18.4
No	249	81.6
Taking action		
Exercise	127	41.6
Others(family, diet)	178	58.4

3.4. Information regarding association between prevalence of GDM and other variables

Table 4 showed the relationship between GDM and other variables. This table showed that there was significantly relationship between gestational diabetes mellitus, non-gestational diabetes mellitus and educational level, diabetic diet, pregnancy times overweight because P-value is 0.000, 0.002 and 0.000 which is less than 0.05.

Table 4. Association between prevalence of GDM and other variables (n=305).

Variables	GDM status		Total	P-value	Chi-square
	GDM	Non-GDM			
Educational level					
Illiterate	13	24	37		44.101
Primary	6	8	14		
S.S.C	23	53	76	0.000	
H.S.C	47	74	121		
Graduate	18	39	57		
Diabetic diet					
Yes	45	84	129		36.312
No	62	114	176	0.002	
Pregnancy times overweight					
Yes	38	80	118		31.201
No	69	118	187	0.000	
Total	107	198	305		

4. Discussion

In the present study the prevalence of gestational diabetes mellitus was 35.1%. Our finding is higher than the one reported in a similar study, where only 15.5% of the pregnant women indicated had gestational diabetes mellitus (Heckhausen *et al*., 1985). Among respondents 34.4% had positive family history of diabetics and 57.7% did not exercise regularly. Though a great number of respondents (87.2%) were received antenatal checkup according to schedule time (Anderberg *et al*., 2007). Most of the respondents (52.1%) had normal delivery, 26.6% respondents had caesarian delivery and very few (7.9%) respondents had forceps delivery. Majority (54.4%) of the respondents had previous obstetrical history, 19.4% had anti partum hemorrhage, 10.8% had placenta previa, 9.2% had still birth and lastly 6.2% had low birth weight history. This is contrary to the findings of other studies conducted by Gavard and Artal who reported minimal or no documentation practices among pregnant women on gestational diabetes (Gavard and Artal, 2008). About 23.6% respondents had attended GDM program and 18.4% respondents' had taken role to prevent GDM. In this study it has been found that educational level of the respondents was significantly associated with diabetic diet, about gestational diabetes mellitus and pregnancy times overweight. Some studies also reported that there is increasing evidence on the impact of continuing education program on gestational diabetes mellitus (Tieu *et al*., 2008).

5. Conclusions and recommendations

On the basis of the findings of this study it is clear that the prevalence of gestational diabetes was more (31.4%) than international population based studies report prevalence's of GDM up to 15.5%, but most of the respondents received ANC according to schedule times. There are needed to take appropriate measures to improve them. They require an intensive health education program to improve their status of knowledge and to lead a healthy life. This study recommended a need to implement a continuous professional education program or training for the pre-natal and post-natal care provider regarding Gestational Diabetes. It also recommends antenatal checkup counseling on Gestational Diabetes among pregnant women, so that they can decide and plan before the delivery.

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Conflict of interest

None to declare.

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