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SOCIO-ECONOMIC CONTEXTS AND CO-MORBIDITIES OF GDM OF THE PATIENTS ATTENDING IN A SELECTED HOSPITAL OF DHAKA CITY, BANGLADESH

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Abstract: *Prevalence of Gestational Diabetes Mellitus (GDM) is increasing alarmingly in the south Asian lower incoming countries, and Bangladesh is no exception. However, as far as reviewed, very few studies found to address the socio-economic context and co-morbidities of GDM mothers in Bangladesh, which in the present study depicted especially in urban and semi-urban settings. A cross sectional study was conducted among pregnant women with known GDM, attending for antenatal check- up in BIRDEM Diabetes Centre OPD, Shahabag, Dhaka, Bangladesh in 2016. The study selected 105 GDM patients purposively to collect data with face-to-face-questionnaire, who fulfilled the inclusive criteria. Mean age of mothers was 28.38; (SD=± 4.8) years; and majority (73.3%) of respondents came from urban and semi-urban areas and more than four-fifths (81.0%) had higher family income as Taka 25000 and above. More than two- thirds (68.6%) of them completed graduate above education. More than one-third (38.1%) of them were service holder. Exactly half (50%) of the GDM mothers with co-morbidities had hypertension. Knowledge and screening o f GDM were mostly reported among the higher educated and higher incoming people in urban and semi-urban areas. Study with large sample is highly desired to measure the extent of the problem in broad context.*

Keywords: *Socio-economic contexts, Co-morbidities, GDM patients, Dhaka city, Bangladesh*

Introduction

Recent data show that gestational diabetes mellitus (GDM) prevalence has increased by ~10–100% in several race/ethnicity groups during the past 20 years[1.] . GDM is a public health problem that currently affects a large part of the female population and has short- and long-term consequences for the fetus and the mother[2] and has a greater incidence of preeclampsia, which affects 10-25% of all pregnant diabetics[3.] Systematically synthesized data on global prevalence estimates of GDM are lacking, particularly among developing countries[4]. The rising incidence of Type 2 Diabetes Mellitus in the world along with obesity is a major contributing factor for GDM and the trend of this rise is more steep in the low and middle-income countries thus proportionately increasing the risk for GDM. South Asia falls in this bracket and the responsible factors have to be identified and corrected [5]. Some population-based studies conducted in Bangladesh at different time points have revealed an increasing trend of GDM prevalence ranging from 6% to 14% based on using different diagnostic criteria[6-7]. Increased morbidity and mortality among mothers and newborns in Bangladesh may, in part, be because of increased prevalence of diabetes including GDM. Like other South East Asian (SEA) countries, the prevalence of GDM has also been progressively increasing in Bangladesh[8]. However,

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as far relevant literatures reviewed very few studies conducted in Bangladesh in relation to socio-economic background of the gestational diabetic patients. The present study was undertaken to measure the socio-economic context, dietary pattern and co-morbidities of GDM of patient attending in selected hospital of Dhaka city.

Materials and methods

Study design and setting

A cross sectional study was conducted among pregnant women with known GDM, attending for antenatal check- up in BIRDEM Diabetes Centre OPD, Shahabag, Dhaka, Bangladesh from January to May -2016. A total of 105 GDM patients were selected purposively, who came to the ANC clinic and fulfilled the inclusive criteria. As targeted sample belonged to specific population of GDM mothers attending in outdoor department, BIRDEM Diabetes Centre, Shahabag, Dhaka, and who were willing to participate, the study interviewed them purposively.

Key variables of the study

Age of the women, Education of the women, Occupational Status ,Monthly Income, Family History of GDM mother , Multiple pregnancy, Postpartum hemorrhage , Mode of delivery, Live birth, Still birth, dietary pattern and Co-morbidities.

Data collection

Data were collected after having permission from the authority of BIRDEM Diabetes Centre. A brief introduction was given to the respondents at the beginning to start the procedure. After explaining the whole procedure written consent was taken from the respondents. The entire sample fulfilling the inclusion criteria at then filled up the questionnaire by respondents. The study employed face- to -face interviews lasting 25-30 mins to explore the socio economic information with family history of diabetes, GDM with rural-urban background, history of complication in earlier pregnancy, and dietary pattern of GDM mother, which helped in triangulating findings of socio-economic contexts and co-morbidities of GDM mothers. However, a chart of balanced diet and food intake frequency was used to collect the information of dietary pattern of GDM mother by which respondents were asked to recall the food items taken in the last 24 hours and the foods taken regularly in a week as wells.

Data analysis

All the collected data were reviewed, cleaned and then, univariate and bivariate analysis were performed and showed usual individual socio-economic context of GDM patients and association between gestational diabetes and other socio-demographic variables among the women with diabetes in pregnancy.

Ethical considerations

The ethical issues in the study were considered and approved by the appropriate authority of the Department of Public Health, Faculty of Allied Health Sciences. The study was initiated after getting the permission from the authority of BIRDEM Diabetes Centre, and the interview was conducted individually maintaining confidentiality of the information strictly along with taking informed consent from the sample participants. Respondents were informed about the nature of the research method that was used they were free to withdraw from the study at any time they like to.

Study context

The prevalence of GDM has weak but significant relation with socioeconomic status including education level, ethnicity, parity, maternal age, nutrition, previous history of GDM and family history of diabetes. The association between GDM and socioeconomic status is not well established because previous studies have reported conflicting results due to different definitions used for economic status.

The increasing incidence of GDM, independent of ethnicity, socioeconomic status, or maternal age, has many short-term adverse pregnancy outcomes and long-term future risk of type 2 diabetes. Lower socioeconomic status is well recognized as a risk for chronic disease in developed and developing countries. Socially disadvantaged GDM women are less likely to seek perinatal care and thus having more pregnancy complications. In Bangladesh, diabetes has become highly prevalent and is growing at a faster rate. Identification of high-risk group like GDM helps to initiate preventive measures for them so that the onset of diabetes can be delayed or prevented. Thus huge health expenditure for diabetes can be minimized. This study will help us to determine possible socio- economic background and maternal and fetal outcomes among women with gestational diabetes attending in primary level hospital.

Results

A total of 105 mothers were interviewed and all of them participated actively. Data were based on the answers came from interviews and medical records registered in the antenatal cards, diabetic booklet, delivery notes in hospital files and hospital record books.

Mean age of mothers was 28.38; (SD=± 4.8) years; minimum 19 years & maximum 38 years. GDM was seen in increased number among mothers aged >19-24 years and majority (73.3%) of respondents came from urban and semi-urban and three-fourths (76.2 %) of the women were Muslim. More than four-fifths (81.0%) had higher family income as Taka 25000 and above. Majority (72.4%) of the respondents had normal body weight (Table-1).

Table 1: Characteristics of participants [n=105]

Socio -demographic variables		**Number**	**Percent**
Age group (yrs)	19-24 years	30	28.6
	25-29 years	44	41.9
	30-38 years	31	29.5
Mean = 28.38; (SD = ± 4.777)			
Living setting	Rural	28	26.7
	Urban & Semi-urban	77	73.3
Religion	Muslim	80	76.2
	Hindu	15	14.3
	Christian	10	9.5
Monthly family income (TK)	10000-25000	20	19.0
	25001-50000	42	40.0
	50001-75000	12	11.4
	75000-200000	31	29.5
Mean = 69447.62; SD = ± 55358.965			
Body weight			
Normal		77	73.3
Below Normal		28	26.7

Educational level of the mothers, who came to hospital for GDM, was remarkably higher, where more than two- thirds (68.6%) completed graduate above and only 3.8% were up to primary level (Figure 1). More than one-third (38.1%) of them were service holder, around one-third (32.4 %) of them were housewives (Figure 2).

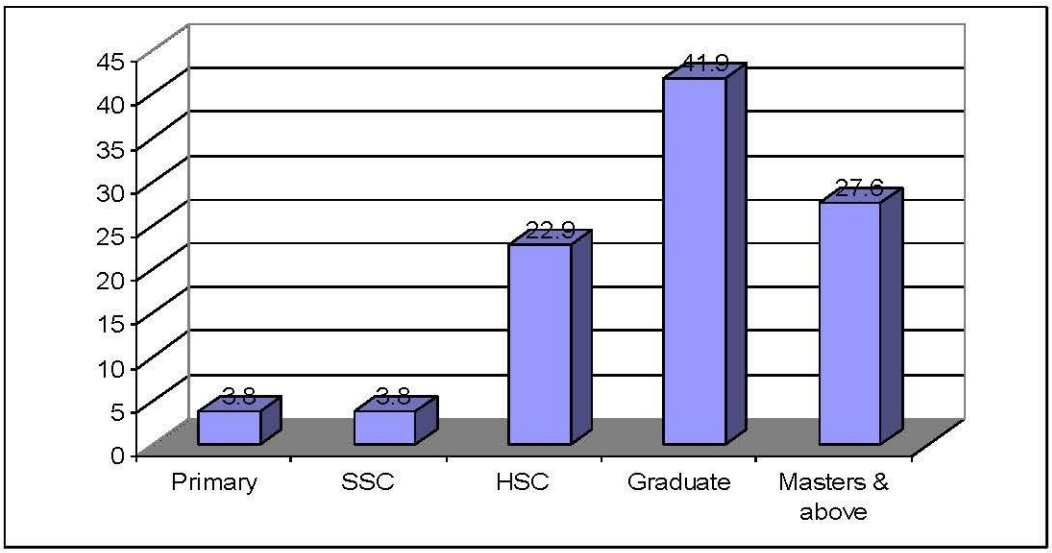

Figure 1: Distribution of the respondents by level of education

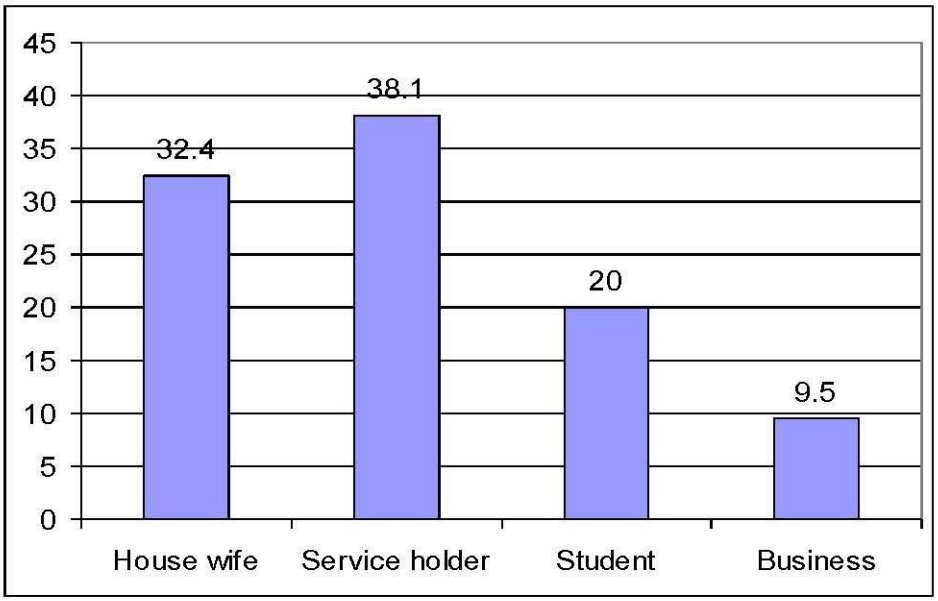

Figure 2: Distribution of the respondents by occupation

Table-2 shows that more than half (54.6%) of the respondents' parents had diabetes followed by 12.1% were brother, 19.9% were sister.

Table 2: Distribution of the respondents' by their blood relatives' history of diabetes [n = 47]

Blood relatives	Number	Percent
Father	31	22.0
Mother	46	32.6
Brother	17	12.1
Sister	28	19.9
Grand father	4	2.8
Grand mother	2	1.4
Grand father (maternal)	3	2.1
Grand mother (maternal)	10	7.1
Total	**141**	**100.0**

*Multiple responses

More than one-third (37.5%) respondents had the history of GDM. Among the GDM mothers around one–fourth (24.8%) had previous co-morbidities. Exactly half of them (50%) had hypertension as co-morbidities. Three- fourths (75%) of the respondents' delivery were caesarian section. Here it revealed that, 37.5% were ≤2.5 kg of newborn weight However, only 10.8% were congenital abnormalities (Table 3).

Table 3: Distribution of the respondents by history of GDM during previous pregnancy

Variables	Number	Percent
GDM (n=72)		
Yes	27	37.5
No	36	50.0
Don't know	9	12.5
Co-morbidities (n=105)		
Yes	26	24.8
No	79	75.2
Type of co-morbidities(n=26)		
Hypertension	13	50.0
Bronchial asthma	9	34.6
Others	4	15.4
Mode of delivery (n=105)		
Caesarean section	79	75.2
Normal	26	24.8
Weight of newborn (n=64)		
≤2.5 kg	24	37.5
>2.5 kg	40	62.5
Congenital abnormalities (n=65)		
Yes	7	10.8
No	58	89.2

Near about one-third (30.5%) had balance diet regularly followed by around half of them (48.6%) had sometimes and the rest (21.0%) had never balance diet regularly, and more than two-fifths (45.7%) of

GDM mothers had three times meals and more than one-third (35.2%) had meal four times per day and the rest (19.1%) had meals five times per day (Table 4).

Table 4: Distribution of the respondents by intake of balance diet

Variables	Number	Percent
Balance diet (105)		
Yes	32	30.5
Sometimes	51	48.6
Never	22	21.0
Meal intake per day		
Three times	48	45.7
Four times	37	35.2
Five times	20	19.1

Discussion

This was set to serve the purpose of getting an overview of associated socioeconomic context and pregnancy outcome of GDM mothers in Bangladeshi population. Mean age of mothers was 28.38; (SD=± 4.8) years; minimum 19 years & maximum 38 years. GDM was seen in increased number among mothers aged >19-24 years Similar finding was documented in a study conducted in Uganda [9], which also showed 28.6 years as the mean age of GDM mothers. Another hospital based study conducted by among Bangladeshi GDM mothers also observed nearly the similar mean age of 28.35 ± 5.34 years [10].

As the study place BIRDEM Diabetes Centre, Shahabag, Dhaka was in the center of Dhaka city, majority (73.3%) of the patients with GDM came from urban and semi-urban areas. This result explicitly indicated that knowledge, awareness and screening of GDM found remarkably higher among the GDM mothers of urban and semi-urban areas than rural areas for their sound socio-economic contexts and availability of treatment services. Similarly, some other studies on Bangladeshi urban population reported that female had higher prevalence of diabetes in urban areas compared to rural areas[11-12] and the consistent result was observed by the Ministry of Health and Family Welfare Government of India[13] that showed prevalence of GDM is more in urban and semi- urban areas than rural areas.

More than one-third (38.1%) of the respondents in this study were service holder, around one-third (32.4 %) of them were housewives, while a study in Chittagong, Bangladesh[12] found 69% of the participants are housewife, 13% are service holder. In this study, educational level of the mothers, who came to hospital for GDM, was remarkably higher where more than two-thirds (68.6%) of them had up to graduate above education, and only 3.8% completed up to primary level. This was, however, variance with the study in Peshawar, Pakistan[14], where it was found that the majority of the participants 60.2% GDM women were illiterate and ignorant of the disease. Such variance with present study had also been reported by other studies in Haryana, India[15], which noted that only 14.3% were graduate or above and also showed an inverse association between the educational level of the pregnant woman and gestational diabetes mellitus.

This study observed that more than half (54.6%) of the respondents' parents had diabetes according to 12.1% were brother, 19.9% were sister. This finding was comparably similar in the other study[16] that showed that diabetes is passed down from mothers and fathers to their children. A person with a parent, brother, or sister with type 1 diabetes has a greater chance of also developing type 1 diabetes.

Around one–fourth (24.8%) of the GDM mothers in the present study had previous co-morbidities and exactly half of them with co-morbidities had hypertension which was similarly confirmed in another study [17], which explored that Women with GDM have an increased incidence of hypertensive disorders during pregnancy, including gestational hypertension, chronic hypertension, pre-eclampsia, and eclampsia.

In this study, more than four-fifths (81.0%) of the reported GDM patients had higher family income of Taka 25000 and above. Similar finding recorded in the study based on Bangladeshi urban GDM mothers that largely people living in urban areas, who came from a family with income of more than Bangladeshi Taka (BDT) 20,000/- per month [10], whereas Household Income and Expenditure Survey (HIES) 2010 [18] reported that average income of the household in urban areas were Taka 16475. This study indicated that mothers with more than average family income only come in hospitals for screening and necessary treatment of GDM.

Conclusion

Urban and suburban woman with increasing age or who had family history of diabetes were at higher risk for GDM. Gestational hypertension, caesarean section and preterm delivery were more prevalent in the women with GDM. Though the occurrence of macrosomic babies were very low in the GDM patients in this study but the likelihood of birth weight more than 2.5 kg was more in them. However, knowledge and screening of GDM were mostly observed among the higher educated and higher incoming background of the GDM mothers in urban and semi-urban areas.

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