Prevalence of Gestational Diabetes in Some Selected Slums of Dhaka City

Faruk Ul Islam¹ | Hamida Khanum²

¹American International University-Bangladesh, Dhaka. ²Parasitology Branch, Department of Zoology, University of Dhaka, Dhaka 1000.

Abstract

Aims: The present study descriptive type of cross sectional study was conducted to explore the prevalence of Gestational diabetes mellitus (GDM) in some selected slums of Dhaka city with a sample size of 236. The study population was pregnant women in Dhaka city, their socio-demographic characterist, the family and obstetric history (current and previous) related variable of the respondents and assess the clinical test related variable. Study design: The study population were pregnant women in Dhaka city. Non-randomized, purposive sampling technique was followed for this study. A semi structured, pre-tested, modified and interviewer administered questionnaire was used to collect the data. Place and duration of study: Pregnant mother in 14 number outfall slum in Dhaka city. The study period was four months started from February 2017 to May 2017.

Results: It was found that, the majority of the respondents (56.8%) were in the age group 16-25 years followed by 38.6%, 2.1% and 2.5% were in age group 26-35 years,<15 years and >35 years respectively with mean age 23.74 ± 5.644 years. Most of the respondents (78%) were Muslim. Among the respondents 53% had primary education, 12% had HSC, 4% HSC, 3% had education of graduate and above, 28% respondents were illiterate. Among the respondents, 78.8% were housewife, 7.6% and 3.8% were engaged in service and business and rest 9.8% were day laborer. Out of 236 respondents, 22.5% had diabetes in their family and 14% respondents had previous history of GDM. Among them 72.9% had normal delivery while, 27.1% had caesarean section. Study also revealed that of the bad obstetric history (BOH) 25.8% had miscarriage, 3.0% still birth, 6.8% preterm baby and 3.4% Intra Uterine Death (IUD). Study also showed that 9.3% of the respondents had GDM, and 13.1% of the respondents had hypertension, 61.9% anemia, 8.1% jaundice, 20.3% edema, 35.6% had frequent urination.

Conclusion: There was an association of age with Fasting Blood Glucose (FBG) level which was statistically significant with P value< 0.014. As GDM is a medical problem and sometimes threatened the life of the mother and baby.

Keywords: Gestational diabetes mellitus, age, obstetric history, Type 2 Diabetes Mellitus

ISSN (O) 2588-8949 | (P) 2588-8930  IF:0.08
INTRODUCTION

Over the past few years a growing prevalence of GDM has also been observed in the hospitals of Bangladesh. But information is scanty on risk factors and pregnancy outcome. Therefore this study had focused on some aspects relevant to risk factors and pregnancy outcomes of GDM mothers[6]. Though there has been a significant decline of infant and child morality the maternal death ratio is still high at over 380 per 100,000 live births [7]. The nutritional status of adolescent girls and women is a key factor in the persistence of malnutrition in Bangladesh. Low birth weight is estimated to affect 30-50 percent of infants[8]. About 70% of the women suffer from nutritionally deficiency anemia. [9] Bangladesh has been experiencing an epidemiological transition from communicable diseases to non-communicable diseases (NCD). Presently, Bangladesh does not have a community based public health program for NCDs. Only hospital based service, although poor, is available[10].

The Health, Nutrition, Population Sector Program (HNPSP) has identified three NCDs-cancer, cardiovascular diseases and diabetes mellitus-as major public health problems. Looking at the surveillance finding worldwide WHO has recommended to list prevalence of diabetes as one of the basic health indicator for its member states. [11] Diabetes mellitus is a chronic disease caused by inherited and/or acquired deficiency in production of insulin by the pancreas, or by the ineffectiveness of the insulin produced[12]. Certain genetic markers have been shown to increase the risk of developing Type 1 diabetes. Type 2 diabetes is strongly familial, but it is only recently that some genes have been consistently associated with increased risk for Type 2 diabetes in certain populations. Both types of diabetes are complex diseases caused by mutations in more than one gene, as well as by environmental factors. According to WHO in 2004, at least 171 million people worldwide had diabetes; this figure is likely to be more than double by 2030. WHO predicts 170% increase in the number of people with diabetes for the developing countries. The greatest increase is projected in India (195%) [13].

The magnitude of diabetes remains unknown due to lack of countrywide survey. Some studies showed that the prevalence is higher in urban areas. In a recent study in Bangladesh a higher prevalence of diabetes was found in urban (8.1%) compared with rural populations (2.3%) [14]. GDM as mentioned is any form of diabetes mellitus or impaired glucose tolerance (IGT) or impaired fasting glucose with first onset or first recognition during the index pregnancy. Thus the diagnosis of GDM is independent of possibility that diabetes or glucose intolerance may have antedated the pregnancy. As diabetes or glucose intolerance in women is more frequently discovered during pregnancy WHO has recommended including such cases under the definition of GDM. Such a broad definition has a great practical value and has boosted research on GDM [15].

Pregnancy is normally attended by progressive insulin resistance that begins near mid-pregnancy and progresses through the third trimester. The fact that insulin resistance rapidly abates following delivery suggests that the major contributors to this state of resistance are placental hormones. Moreover pancreatic cells normally increase their insulin secretion to compensate for the insulin resistance of pregnancy. As a result, changes in circulating glucose levels over the course of pregnancy are quite small compared with the large changes in insulin sensitivity [16].

In the aftermath of increasing prevalence of type 2 diabetes in Bangladesh, it is reasonable to postulate that there is a growing prevalence of gestational diabetes. Bangladeshi women have been seen to have higher IGT than their male counterpart [17]. Compared to the other South Asian population Bangladesh has higher birth rate [18] and has the prevalence of multiparity. Perinatal mortality and infant mortality is also high in Bangladesh [19]. Though there is no published report on the prevalence of preeclampsia in Bangladesh the Obstetric and Gynecological Society Bangladesh (OGSB) estimates 16% of maternal death from eclampsia. In addition,

Supplementary information The online version of this article (https://doi.org/10.15520/mcrr.v3i11.155 ) contains supplementary material, which is available to authorized users.

Corresponding Author: Faruk Ul Islam
American International University-Bangladesh, Dhaka.
according to OGSB obstructed labour accounts for 8% of maternal death. Frequency of congenital malformations and low birth weight also appears to be higher in Bangladesh [20].

Careful search of literature provided no data on prevalence of GDM based on the time of diagnosis in Bangladesh perspectives. In spite of reports that claim 40-66% of gestational diabetes can be detected in early pregnancy there have been conflicting studies on the usefulness of glucose screening at early pregnancy. Nevertheless one could reasonably suggest that women with gestational diabetes in early pregnancy could benefit from earlier metabolic control as well as prediction of pregnancy and fetal complication in this group [21]. A study conducted in India found different types of fetal complication at different level of glycaemic control. With improved glycaemic control and advanced neonatal care perinatal adversities in GDM have approached that of non diabetic mothers [22].

Justification of the study:

Women with GDM are more likely to give birth to macrosomic or large-for-gestational-age infants. GDM may results in obstructed labour, the death of the mother and the baby and birth injury for the infants. GDM also has long-term health impact, with more than 50% of women with GDM going on to develop type2 diabetes within 5-10 years of delivery [4]. Moreover; infants of women with GDM have a higher prevalence of overweight and obesity, and higher risk of developing type2 diabetes later in life. These sorts of patients would have a suffering throughout life time with different complications of the disease.

In Bangladesh diabetes has become highly prevalent and is growing at a faster rate. Despite this evidence, GDM remains a neglected maternal health issue among policy makers. This small scale study will help other researchers to evaluate more border study that will help to overcome the community from this high risk obstetric condition.

2 | METHODOLOGY

The study population were pregnant women in Dhaka city. Pregnant mother in 14 number outfall slum in Dhaka city. Non-randomized, purposive sampling technique was followed for this study.

2.1. Questionnaire: A semi structured, pre-tested, modified and interviewer administered questionnaire was used to collect the data.

2.2. Place and duration of the study: The study period was four months started from February 2017 to May 2017. The study population was pregnant women in Dhaka city. The study was carried out in a selected community Dholpur, Jatrabari of Dhaka city. Ward # 85 which includes 14 # Outfall, Dhalpur where include: Adarsha Basti, 96 Ghar (staff quarter), 38 Ghar (tin shed), Nabu Basti, Pora Basti including Mannan and Madhya Basti, City Polly, Aynal Basti and Talegue Basti.

2.3. Study design and type of study: The cross sectional type of descriptive study was conducted in order to find out the prevalence of gestational diabetes in some selected slums of Dhaka city with a sample size of 236 pregnant women. Current obstetric history related variables, previous obstetric history related variables, clinical test related variables, IEC related variables were counted.

2.4: Inclusion and Exclusion Criteria: The study population was included only the pregnant women in Dhaka city. Unwilling to participate in the study, Women physically or mentally handicapped were excluded.

2.5: Data analyses: All the data were entered and analyzed by using Statistical Packages for Social Science (SPSS) software version 19.0. Proportion was presented by frequency and cross tabulation analysis.

3 | RESULTS

In the present investigation, 56.8% respondents belonged to 16-25 years age group, followed by 38.6% belonged to 26-35 years age group, 2.1% belonged to <15 years age group and 2.5% belonged to >35 years age group with mean age 23.74 ± 5.644 years
(Table 1). Among the respondents 53% had primary education followed by 12% SSC, 4% HSC, 3% graduate and above and rest 28% respondents were illiterate (Fig. 1). Present study showed that 78.8% respondents were housewife, 7.6% involved in service, 3.8% were engaged in business and rest 9.8% were day laborer (Table 1).

Results showed that half of the respondents (50%) had only 1 child followed by 30.5% had 2, 14.4% had 3, 4.2% had 4 and only 0.8% had 5 children (Fig. 2). It was found that 49.6% of the respondents used supply water, 41.1% used normal water from ponds and rivers and rest of them (9.3%) used boiled water. It was observed that 22.5% of the respondents had diabetes in the family and rest 77.5% did not have.

| TABLE 1: Distribution of the respondents by age (n=236) |
|-----------------|-----------|-------------|
| Age in years   | Frequency | Percentage (%) |
| <15            | 5         | 2.1          |
| 16-25          | 134       | 56.8         |
| 26-35          | 91        | 38.6         |
| >35            | 6         | 2.5          |
| Total          | 236       | 100.0        |

<table>
<thead>
<tr>
<th>TABLE 2: By occupation</th>
</tr>
</thead>
<tbody>
<tr>
<td>House Wife</td>
</tr>
<tr>
<td>Service</td>
</tr>
<tr>
<td>Business</td>
</tr>
<tr>
<td>Day laborer</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

It was found that 49.6% of the respondents used supply water, 41.1% used normal water from ponds and rivers and rest of them (9.3%) used boiled water (Fig. 4). Only 14% respondents had previous history of GDM belonged to 73.7% did not have and rest 12.3% did not know about GDM (Fig. 3). Most of the respondents (72.9%) previous mode of delivery was normal and rest of them (27.1%) was caesarean section (Table 4). The present study showed that of the 25.8% respondents had history of miscarriage followed by 3% was still birth, 6.8% was preterm
baby, 4.6% was big baby and 3.4% was IUD, and rest of them (56.4%) was no such type of history. Study found that (9.3%) of the respondents had GDM and rest of them (90.7%) did not have. Found that (13.1%) of the respondents had hypertension and rest of them (86.9%) did not have (Table 4).

**TABLE 3:** Distribution of the respondents by diabetes in the family (n=236)

<table>
<thead>
<tr>
<th>Diabetes in the family</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>53</td>
<td>22.5</td>
</tr>
<tr>
<td>No</td>
<td>183</td>
<td>77.5</td>
</tr>
<tr>
<td>Total</td>
<td>236</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Found that the (54.6%) GDM developed in 3rd trimester, (31.8%) in 2nd trimester and (13.6%) developed in 1st trimester. Shows that (61.9%) of the respondents had anaemia and rest of (38.1%) did not have. It was found that (8.1%) of the respondents had jaundice and rest (91.9%) did not have. In the present investigation, it was found that, (35.6%) of the respondents suffered from frequent urination and rest (64.4%) did not have, (20.3%) of the respondents had oedema and rest (79.7%) did not have. It reveals that majority of the respondents (80.9%) had knowledge about GDM and rest of them (19.1%) did not have knowledge about it. Shows that (5.9%) of the respondents had visual problem and rest (94.1%) did not have. It was found that (11.9%) of the respondents had delayed healing ulceration and rest of them (88.1%) did not have. Study found that (9.3%) of the respondents had GDM and rest of them (90.7%) did not have (Table 4).

**TABLE 4:** Distribution of the respondents by previous mode of delivery (n=236)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>172</td>
<td>72.9</td>
</tr>
<tr>
<td>Caesarean</td>
<td>64</td>
<td>27.1</td>
</tr>
<tr>
<td>Total</td>
<td>236</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Result shows multiple responses of the respondents.

In the present study, (11.4%) of the respondents obtained information about GDM from radio followed by (37.7%), (8.5%), (73.3%), (17.4%), (47.9%),
TABLE 6: Distribution of the respondents by source of information (n=236)

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio</td>
<td>27</td>
<td>11.4</td>
</tr>
<tr>
<td>TV</td>
<td>89</td>
<td>37.7</td>
</tr>
<tr>
<td>Poster</td>
<td>20</td>
<td>8.5</td>
</tr>
<tr>
<td>Health worker</td>
<td>173</td>
<td>73.3</td>
</tr>
<tr>
<td>Peer feedback</td>
<td>41</td>
<td>17.4</td>
</tr>
<tr>
<td>Mother’s group meeting</td>
<td>113</td>
<td>47.9</td>
</tr>
<tr>
<td>From NGO worker</td>
<td>166</td>
<td>70.3</td>
</tr>
<tr>
<td>From Hospital</td>
<td>76</td>
<td>32.2</td>
</tr>
</tbody>
</table>

(70.3%) and (32.2%) from TV, poster, health worker, peer feedback, mothers group meeting, from NGO worker and from hospital respectively (Table 6). Also showed that 9.3% of the respondents had GDM and rest 90.7% had normal FBG. There is an association among age and FBG level was found and it was statistically significant with P value <0.014 (Table 7).

4 | DISCUSSION

Gestational diabetes mellitus (GDM) is defined as carbohydrate intolerance with onset or recognition during pregnancy [54]. GDM has been seen to be associated with growing pregnancy complication by hospital observation in Bangladesh. Urban prevalence of GDM is predicted even much more while the rural prevalence was found 6.8% and 8.2% according to FBG and 2hBG respectively [2]. GDM affects up to 15% of pregnant women worldwide [49]. In Bangladesh a recent study conducted in a rural community found the overall prevalence of gestational diabetes mellitus is 6.8% with a range of (1.88-9.32) and 8.2% with a range of (3.74-12.64) according to FBG and 2hBG, respectively. Bangladesh had 3.2 million of diabetic patients in 2000 and the number is expected to increase up to 11.1 million by 2030 and placing her among the top 10 countries with diabetes [10].

This descriptive type of cross sectional study was conducted to assess the prevalence of gestational diabetes in slums dwellers of Dhaka city with a sample size of 236. It was found from the study that the majority of the participants, 56.8% were in the age group 16-25 years followed by 38.6%, 2.1% and 2.5% were 26-35 years, <15 years and >35 years respectively with mean age 23.74 ± 5.644 years. This study is almost similar to the study conducted on Prevalence and risk factors for gestational diabetes assessed by universal screening by Di Cianni Get al. [32].

Most of the respondents 78% were Muslim, 16.1% and 5.9% were Hindu and Christian respectively. Among the respondents 53% had primary education followed by 12% SSC, 4% HSC, 3% graduate & above and rest 28% respondents were illiterate. This study is almost similar to the study conducted on Prevalence of gestational diabetes mellitus in urban and rural Tanzania by Akwilina et al. [52]: Among the respondents 78.8% were housewife, 7.6% and 3.8% were engaged in service and business and rest 9.8% were day labour. 79.2% of the respondents.

It also showed that half of the respondents 50% had only 1 child followed by 30.5% had 2, 14.4% had 3, 4.2% had 4 and only 0.8% had 5 children. It was found that 49.6% of the respondents used supply water, 41.1% used normal water from rivers and ponds and rest 9.3% used boiled water. It was found that majority of the respondents 22.5% had diabetes in the family and rest 75.5% did not have. Study showed that among the respondents 14% had previous history of GDM, 73.7% did not have and rest 12.3% was unknown about it. Those findings are reverse to the study conducted on Socio-demographic Risk Factors of Gestational Diabetes Mellitus by Radhia Khan et al. [50] in Pakistan. Due to different life style pattern of two countries the history of GDM varies to some extent [50].
Study revealed that majority of the respondents (80.9%) had heard about GDM and rest of them 19.1% did not hear. This result is almost similar to the study conducted on Gestational diabetes mellitus: Pilot study on patient’s related aspects by Zahid Hussain et al [53]. Archives of Pharmacy Practice, 2014 – Medknow.53 Showed that 11.4% of the respondents source of information about GDM was radio followed by 37.7%, 8.5%, 73.3%, 17.4%, 47.9% 70.3% and 32.2% was TV, poster, health worker, peer feedback, mothers group meeting, from NGO worker and from hospital respectively.

There is an association among age and FBG level was found and it was statistically significant with P value <0.014. A standard treatment guideline including referral instruction is to be prepared and made available to the health professional so that they can identify GDM as well as make a proper birth plan for pregnancy with GDM. Women with GDM should be followed up after delivery in order to monitor hyperglycemic status and so advised accordingly. Should be arrange a awareness program of complication of GDM so that mother can know the actual danger and they can alert. Further studies are needed with long duration and large sample size for more accurate results.

### CONCLUSION AND RECOMMENDATIONS:

Historically, infants born to mother with diabetes (GDM) have significantly greater risk for spontaneous abortion, stillbirth, congenital malformations, obstructed labour, and perinatal mortality and morbidity. GDM also has long-term health impact, more than 50% of women with GDM undergo develop type 2 diabetes later in life. Commonly recognized risk factors for GDM are prevalent in the study population. Women diagnosed with GDM at an early pregnancy were more likely to be treated with insulin. Hypertension, caesarean section and preterm delivery were more prevalent in the women with GDM.

A standard treatment guideline including referral instruction is to be prepared and made available to the health professional so that they can identify GDM as well as make a proper birth plan for pregnancy with GDM. Women with GDM should be followed up after delivery in order to monitor hyperglycemic status and so advised accordingly. Should be arrange a awareness program of complication of GDM so that mother can know the actual danger and they can alert. Further studies are needed with long duration and large sample size for more accurate results.

### CONSENT AND ETHICAL APPROVAL:

Permission was taken from the Ethical Committee at American International University Bangladesh before starting the study, i.e. collection of data. The respondents, were clearly informed on the aims and objectives of the study. As per international standard or university standard, respondents’ written consent has been collected and preserved by the authors.

### ACKNOWLEDGEMENT

We like to express our sincere, deepest and heartfelt gratitude to the Faculty of Arts and Social Science, Public Health Department, American International University- Bangladesh, permitted and supported to conduct this research for the MPH courses.
6 | REFERENCES:


56. Gestational Diabetes Mellitus experience in BSMMU-Bangladesh by Muhammad Abul Hasanat at 12th European Diabetes Congress, September 15-17, 2016 Berlin, Germany.

How to cite this article: Islam F.U., Khanum H. Prevalence of Gestational Diabetes in Some Selected Slums of Dhaka City. Journal of Medical Care Research and Review. 2020;467–475. https://doi.org/10.15520/mcrr.v3i11.155