

Original Article

Prevalence of Type 2 Diabetes Mellitus in Rural Adults (≥ 31 years) in Bangladesh

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Abstract:

Diabetes is one of the most prevalent and serious non-communicable diseases all over the world. It is the leading cause of death, disability, and economic loss, and it is identified as a major threat to global development. Among the adults (age 20-79 years) with diabetes in the top five South East Asian countries, Bangladesh is in the second position. The number of people with diabetes in Bangladesh was 5.10 million in 2013, which is expected to increase to 8.20 million by 2035. Therefore, this study aimed to estimate the prevalence of type 2 diabetes in a rural population aged ≥ 31 years living at a village in the district of Bagerhat, Bangladesh, and to aware the people of the area about diabetes and to detect diabetes early for early care to prevent its complications. In this study we used 'Prodigy Preferred blood Glucose Meter' for testing fasting blood glucose to diagnose diabetes. The study was conducted from 2012 to 2015. Random sampling method was used to select participants. Fasting plasma glucose of the 400 participants of ≥ 31 years of age was done at a 'Free Friday Clinic' of the study area. Out of 400 participants 38 (9.50%) were diabetic. Among the participants (n=400), 45.50% were male and 54.50% were female. We found a high prevalence of DM in the rural Bangladeshi adult population (9.5%). The present study found that about one in ten Bangladeshi adults has diabetes (9.5%). This finding is consistent with many other studies from low-and middle-income countries including India (8.6%), Sri Lanka (8.0%), China (9.6%), Nauru (13.7%), and Panama (9.5%). Our study together with previous study confirms that prevalence of diabetes is increasing in Bangladesh.

Key words: Type 2 Diabetes Mellitus, Prevalence, Rural Adult, Bangladesh.

Introduction:

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, specially the eyes, kidneys, nerves, heart, and blood vessels.

Several pathogenic processes are involved in the development of diabetes. These range from autoimmune destruction of the β -cells of the pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action.

The vast majority of cases of diabetes fall into two broad etio-pathogenetic groups. In one category, type 1

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diabetes, the cause is an absolute deficiency of insulin secretion. In the other, much more prevalent category, type 2 diabetes, the cause is a combination of resistance to insulin action and an inadequate compensatory insulin secretory response. This form of diabetes previously was referred to as non-insulin-dependent diabetes or adult-onset diabetes. Diabetes is one of the most prevalent and serious non-communicable diseases all over the world. It is the leading cause of death, disability, and economic loss, and, it is identified as a major threat to global development¹⁻⁴. Moreover, it can lead to a multitude of complications, such as heart disease, stroke, renal failure, and blindness⁵⁻⁷. Therefore, it possesses a major health care burden all over the world⁸ and similar to the developed countries, several studies^{3,9-13} suggested that people of Asia, especially South-East Asia are at a higher risk of type 2 diabetes irrespective of region, diet, and socioeconomic status¹⁴. According to the International Diabetes Federation³, the South East Asia region consisting of Bangladesh, India, Sri Lanka, and Nepal is the home of more than 72 million adults with diabetes, which is expected to exceed 135 million by 2035^{3,15,16}. Among the adults (age 20-79 years) with diabetes in the top five South East Asian countries, Bangladesh is in the second position³. The number of people with diabetes in Bangladesh was 5.10 million in 2013, which is expected to increase to 8.20 million by 2035^{3,17}.

Literature search has shown that there are few data available on the prevalence of type 2 diabetes in Bangladesh as a whole. Studies examining data trends within Bangladesh point to evidence of a dramatic increase in prevalence in both rural and urban setting, affecting both gender equally¹⁰.

The current work was based on the hypothesis that in view of the alarming figures of diabetes in rural Bangladesh, may benefit from diabetes screening, and hence be protected from the complications of diabetes through a systemic screening to help pursue serving flag with well-maintained health and physical fitness. Therefore, this study aimed to estimate the prevalence of type 2 diabetes in a rural population aged ≥ 31 years living at a village in the district of Bagerhat, Bangladesh, and to aware the people of the area about diabetes and to detect diabetes early for early care to prevent its complications.

Materials and Methods:

Test for screening and diagnosis of diabetes mellitus are readily available. The test recommended for screening is the same as that for making diagnosis, with the result that a positive screen is equivalent to a diagnosis of pre-diabetes or diabetes mellitus¹⁸. It is still based on the American Diabetes Association(ADA) guidelines of 1997 or World Health Organization (WHO) National diabetic group criteria of 2006, which is for a single raised glucose reading with symptoms (polyuria, polydipsia, polyphagia and weight loss), otherwise raised values on two occasions of either fasting plasma glucoses(FPG) ≥ 7.0 mmol/L (126mg/dl) or with an oral glucose tolerance test (OGTT), two hours after the oral dose a plasma glucose ≥ 11.1 mmol/L (200mg/dl)¹⁸. In this study we used '*Prodigy Preferred blood Glucose Meter*' for testing fasting blood glucose to diagnose diabetes. According to the '*Prodigy Preferred blood Glucose Meter*' the normal values are for FPG 70-100gm/dl and for PPG (2 hours after meal) ≥ 140 gm/dl.

Diagnostic Criteria for diabetes: Participants without a prior diagnosis of diabetes were categorized according to the 1999 World Health Organization diagnostic criteria as follows: undiagnosed diabetes FPG ≥ 7.0 mmol/L¹⁹.

The study was conducted from 2012 to 2015. Random sampling method was used to select participants. Fasting plasma glucose of the 400 participants of ≥ 31 years of age was done at a 'Free Friday Clinic' of the study area (a village of Bagerhat District in Bangladesh). The result is calculated by simple percentage.

Result:

A summary of the total participants with age-group distribution was shown in the table I. Among the participants (n=400), 45.50% were male and 54.50% were female. 31-40 years aged females were the highest participants (81 out of 400).

Table I. Age group distribution by gender n (%)

Age group (years)	Male n (%)	Female n (%)	Total n(%)
31-40	41(22.52)	81(37.16)	122(59.68)
41-50	51(28.02)	57(26.15)	108(54.17)
51-60	45(24.72)	46(21.10)	91(45.82)
61-70	29(05.93)	22(10.09)	51(16.02)
71	16(08.79)	12(05.50)	28(14.29)
Total	182(45.50)	218(54.50)	400(100)

n=number of participants

The table II shows the prevalence of diabetes. Out of 400 participants 38 (09.50%) were diabetic. 41-50 years age group were more (15.74%) and 31-40 years age group were the least. 51-60 years age group was relatively less diabetic.

Table II. Prevalence of diabetes in total group n (%)

Age group (years)	X(n)	%
31-40	05(122)	1.25
41-50	17(108)	4.25
51-60	04(91)	1.00
61-70	08(51)	2.00
71	04(28)	1.00
Total prevalence	38(400)	9.50

X=number of diabetic case.

Table III. Prevalence of diabetes by gender x (n) %

Age group (years)	Male		Female		Total X(%)
	X(n)	%	X(n)	%	
31-40	0(41)	0.00	05(81)	1.25	05(1.25)
41-50	9(51)	2.25	08(57)	2.00	17(4.25)
51-60	2(45)	0.50	02(46)	0.50	04(1.00)
61-70	3(29)	0.75	05(22)	1.25	08(2.00)
71	3(16)	0.75	01(12)	0.25	04(1.00)
Total prevalence	17(182)	4.25	21(218)	5.25	38(9.50)

X=number of diabetic case.

The table III shows the prevalence of diabetes by gender. The table also shows that female participants were more diabetic than male participants, and out of 41 participants of 31-40 years age group, none of them were diabetic.

Discussion:

The study area was our known area. The most of the participants were farmers and fishermen and a few were sedentary workers of a village of Bangladesh. The main components of the food of the participants were rice, vegetables, fish and occasionally meat and sweet meats. We selected randomly the participants of ≥ 31 years of age group as type 2 diabetes usually occur in these groups of people.

In the present study, we found a high prevalence of DM in the rural Bangladeshi adult population (9.5%). Prevalence of DM in male is less than female (4.25% and 5.25 respectively). Its global prevalence was about 8% in 2011 and is predicted to rise to 10% by 2030²⁰. The present study found that about one in ten Bangladeshi adults has diabetes (9.5%). This finding is consistent with many other studies from low-and middle-income countries including India (8.6%)²¹, Sri Lanka (8.0%)²², China (9.6%)²³, Nauru (13.7%)²⁴, and Panama (9.5%)²⁵. According to the 2013 estimates by the International Diabetes Federation (IDF), the age-standardized prevalence of diabetes was 6.3% in Bangladesh, which was lower than our present estimate. Our study together with a previous study confirms that prevalence of diabetes is increasing in Bangladesh²⁴.

There were several limitations of the current study. First, dietary intake and physical activity were not assessed in our study. Body weight and personal economic factors were not included in this study. Moreover, we took the capillary blood from finger tips and only fasting blood sugar was seen.

Conclusion:

Our study together with a previous study confirms that prevalence of diabetes is increasing in Bangladesh. In view of the alarming figures of diabetes in rural Bangladesh, may benefit from diabetes screening, and hence be protected from the complications of diabetes through a systemic screening to help well-maintained health and physical fitness.

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