

Study Characteristics of Juvenile Diabetes Mellitus Cases in Bangladesh

Rezaul Karim; BCS; M.PH; Ph.D.¹, Nusrat Jahan Mona; B.Sc.²

1 Department of Population Dynamic, National Institute of Preventive and Social Medicine (NIPSOM), Mohakhali, Dhaka, Bangladesh

2 Bangladesh Medical College and Hospital, Dhanmondi, Dhaka, Bangladesh

Received March 2013; revised and accepted September 2013

Abstract

Objective: To identify the proportion and some selected characteristics of juvenile diabetics attending BIRDEM hospital.

Materials and methods: This was a cross sectional study. The study was conducted in the BIRDEM hospital. All Diabetic young aged up to 18 years who visit BIRDEM hospital were included in study population. The sample size was 240.

Results: It was observed that among the respondents 43.3% were protein deficient pancreatic diabetes (PDPD), 30.8% were Type-1 diabetes, 20% were fibro-calculus pancreatic diabetes (FCPD) and remaining 5.8% were Type-2 diabetes. Family history of diabetes was found among one-fifth of the respondents. It was found that majority 86.4% of Type-1 diabetes were presented in early age <10 years in contrast to Type-2 diabetes 4.5%, PDPD 9.1% and FCPD 0.0%. It was found that 50% of type-1 diabetes patient and 17.6% of Type-2 diabetes patient were from urban area and 24.5% of FCPD patient and 52.8% of PDPD patient were from rural areas. It was observed that Type-1 and Type-2 diabetes were associated with the family history of diabetes mellitus than FCPD and PDPD. Severe underweight and sever stunted was significantly higher among the protein deficient diabetes mellitus compare to Type-2 diabetes.

Conclusion: Juvenile diabetes is emerging health problem in modern era. Like old population the incidence of juvenile diabetes is increasing day by day. It is time for the health planner to prevent and control the disease; otherwise it will be major problem after a decade.

Keywords: Family History of Diabetes, Nutritional Status, Dietary Pattern, Duration of Diabetes

Introduction

Bangladesh is a developing country; here communicable diseases and nutritional problem, over population are priority problem for public health

Correspondence:

Rezaul Karim, Department of Population Dynamic, National Institute of Preventive and Social Medicine (NIPSOM), Mohakhali, Dhaka-1212, Bangladesh
Email: drr_kari@yahoo.com

sector. Consequently, non communicable diseases, such as diabetes mellitus, ischaemic heart diseases, hypertension, which are lifelong chronic illness, with risk of life threatening complications are getting less priority. Diabetes mellitus, a chronic disease once thought to be uncommon in the developing world, has now emerged as an important public health problem in Asia (1). It is a major and growing health problem at all ages and in all countries. It is also the commonest endocrine disorder amongst the young

and adolescents. Usually it causes prolonged ill health and early death. In young, growth failure and delayed puberty are well documented (2).

In Bangladesh, there has not been any epidemiological study on juvenile diabetes. Recent studies from the Asian sub-continent showed an increasing prevalence of diabetes in young (3). In Bangladesh like many other developing countries the number of new cases of diabetes is increasing every year. Unfortunately, there is still inadequate awareness about the real dimension of the problem among the general public in the South-East Asia region. There is lack of awareness about the existing interventions for preventing diabetes and the management of complications. Poor detection of cases, sub-optimal treatment, and insufficient follow up leading to unnecessary disabilities and severe complications, often result in early death (4). In addition to Type- 2 DM, which is rather silent, chronic, often unidentified killer mostly among the adult population, the Type- 1 DM makes more dramatic appearance in affected young. They develop symptoms of ketoacidosis and often die, since the majorities do not have access to adequate medical care and since insulin is often either not available or too expensive (2).

Almost all of these deaths would be preventable if free or subsidized insulin and adequate health care services were available (3). The prevalence of insulin dependent diabetes in young is 0.26 per thousand in the urban area in south India. But the prevalence of other Asian countries likes Japan 0.06 per thousand and China 0.09 per thousand is lower than India (5). However, this is much less than the prevalence reported from North Europe 2.1 per thousand (6). Till now there is no study on the prevalence of juvenile diabetes in our country.

There are several factors identified in different studies in different countries, which are associated with juvenile diabetes, but there is no such study conducted in our country. The type of diabetes are seen in our country is different from developed

country and it is very much essential to identify the risk factors to prevent the disease.

Finding of this study will help in the research field and also the planner to develop appropriate policy and programs for prevention and control of juvenile diabetes.

Materials and methods

This was a cross sectional study. The study was conducted in the BIRDEM hospital. Total 240 diabetic patients selected purposively. Designed questionnaire was used for data collection. The questionnaire was pre-tested before final used for data collection. Data were collected by face to face interview by questionnaire and checklist. All patients aged up to 18 years with diabetes who come to the BIRDEM for their treatment and for follow- up were included in the study population. After completion of interview, anthropometric measurements of the studied patients were taken. Data on height, weight, mid arm circumference and skin fold thickness of the studied patients were taken through standard instruments. All the data which were checked for integrity and collected from field were entered for analysis by using SPSS software program.

Results

It was found that Type-1 50.0% and Type-2 17.6% diabetes mellitus were high among the urban patients. FCPD 24.5% in rural areas and PDPD 54.5% in sub urban areas and the difference were statistically significant ($p < 0.001$) (Table 1).

Study revealed that the type-1. 33.3% and PDPD 44.4% were high among the boys, whereas Type II 6.0% and FCPD 21.4% were high among the girls, but the difference was not statistically significant ($p > 0.05$) (Table 2).

Result found that Type I and Type- 2 diabetes mellitus were significantly associated with family history of diabetes mellitus than FCPD and PDPD ($p < 0.05$) (Table 3).

Table 1: Distribution of type of diabetes mellitus and residence among the respondents

Residence	Type of DMn (%)				Total
	Type- I DM	Type- 2 DM	FCPD	PDPD	
Rural	24 (22.6)	0 (0.0)	26 (24.5)	56 (52.8)	106 (100.0)
Urban	34 (50.0)	12 (17.6)	10 (14.7)	12 (17.6)	68 (100.0)
Suburban	16 (24.2)	2 (3.0)	12 (18.2)	36 (54.5)	66 (100.0)
Total	74 (30.8)	14 (5.8)	48 (20.0)	104 (43.3)	240 (100.0)

$\chi^2=25.652$; $df=6$, p value= 0.001

Table 2: Sex distribution of diabetic among the study population by type of diabetes mellitus

Sex	Type of DM n (%)				Total
	Type- I DM	Type- 2 DM	FCPD	PDPD	
Boys	24 (33.3)	4 (5.6)	12 (16.7)	32 (44.4)	72 (100.0)
Girls	50 (29.8)	10 (6.0)	36 (21.4)	72 (42.9)	168 (100.0)
Total	74 (30.8)	14 (5.8)	48 (20.0)	104 (43.3)	240 (100.0)

$\chi^2=0.411$; df=3, p value=0.938

Table 3: Distribution of type of diabetes mellitus by family history of diabetes mellitus

Family history of DM	Type of DM n (%)				Total
	Type-I DM	Type- 2 DM	FCPD	PDPD	
Yes	18 (34.6)	10 (19.2)	6 (11.5)	18 (34.6)	52 (100.0)
No	56 (29.8)	4 (2.1)	42 (22.3)	86 (45.7)	188 (100.0)
Total	74 (30.8)	14 (5.8)	48 (20.0)	104 (43.3)	240 (100.0)

$\chi^2=12.137$, df=3, p value=0.007

Table 4: Distribution of type of diabetes mellitus by height for age

Height for age	Type of DM n (%)				Total
	Type- I DM	Type- 2 DM	FCPD	PDPD	
Normal	18 (69.2)	2 (7.7)	2 (7.7)	4 (15.4)	26 (100.0)
Stunting	28 (27.5)	8 (7.8)	22 (21.6)	44 (43.1)	102 (100.0)
Moderate, stunting	12 (16.7)	4 (5.6)	22 (30.6)	34 (47.2)	72 (100.0)
Severe Stunting	16 (40.0)	0 (0.0)	2 (5.0)	22 (55.0)	40 (100.0)
Total	74 (30.8)	14 (5.8)	48 (20.0)	104 (43.3)	240 (100.0)
Mean±SE	-1.41±0.3	-0.67±0.6	-1.64±0.2	-2.19±0.2	-1.75±0.1

p value reached from one way analysis (ANOVA) of variance, F ratio= 4.139, p value=0.008

Table shows the relationship of different types of diabetes mellitus with height for age, which was calculated by Z- score of NCHS. It was observed that out of 240 diabetic patients, 10.8% were normal height for age, 42.5% stunted, 30.0% moderately stunted and 16.7% were severely stunted. It was evident that significant severe stunted was associated with protein deficient diabetes mellitus compared with Type- II diabetes mellitus (p<0.001), but no statistically significant mean difference was found among the other two types of diabetes mellitus such as Type- I and FCPD (p>0.05) shows the relationship of different types of diabetes mellitus with height for age, which was calculated by Z- score of NCHS. It was observed that out of 240 diabetic patients, 10.8% were normal height for age, 42.5% stunted, 30.0% moderately stunted and 16.7% were severely stunted. It was evident that significant severe stunted was associated with Protein deficient diabetes mellitus compared with Type II diabetes mellitus (p<0.001), but no statistically significant mean difference was found among the other two types of diabetes mellitus such as Type- I and FCPD (p>0.05) (Table 4).

It was observed that out 240 diabetic patients 43.3% were PDPD followed by Type- I diabetes mellitus 30.8%, FCPD 20.0% and lowest Type- II diabetes mellitus 5.7% (Figure 1).

Discussion

This cross sectional study was conducted in the BIRDEM hospital to find out the proportion and some selected characteristics of juvenile diabetes.

Regarding age, we have found that eighty two percent of respondents were found in age group 10-19 years. This finding is consistent with a study in Italy by Cotellessa (7), where result shows that age-specific incidence rate is higher in the 10 to 14 year old age group.

Regarding sex distribution, majority of the respondents were female and remaining were male and female to male ratio was 2.3:1, similar finding was found study done by Abdullah (2). Such observations have been found in India study done by Ramachandra (4).

Regarding type of Diabetes mellitus results shown that percent of PDPD was higher than Type-1diabetes,

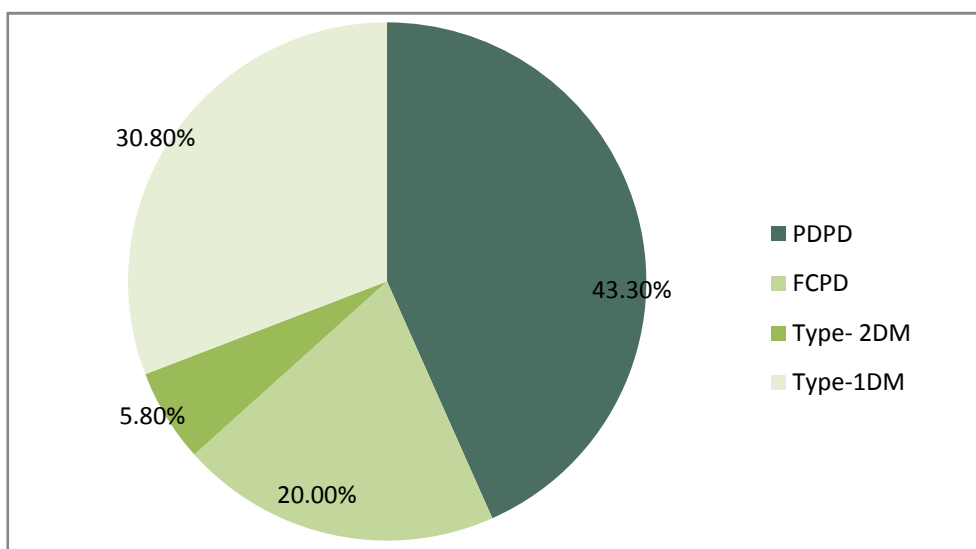


Figure 1: Distribution of diabetic among the respondents by type of diabetes mellitus

FCPD and Type-2 diabetes; this finding is almost similar to the finding of study done by Abdullah and Svensson (2, 8).

Regarding status of diabetes pattern in urban and rural area it was seen that Geographical variation in occurrence of type- 1 diabetes has been studied study done by Karvonen, study finding is consistent in our study (9).

Regarding family history of diabetes it was evident that Type-1 and Type-11 diabetes were significantly associated with positive history of diabetes than FCPD and PDPD. Similar observation was found in study done by Kida (10).

As regard as nutritional status of the respondents it was observed that severe stunting were significantly associated with protein deficient diabetes mellitus compared with Type-11 diabetes mellitus, study done by Svensson that finding is consistent with our study (8).

Conclusion

In this study it was observed that among the respondents, more than two-fifth were PDPD, more than one fifth were Type-1 diabetes, one fifth were FCPD and remaining were Type-2 diabetes. Type-1 diabetes is found predominantly in younger age group and Type-2; FCPD and PDPD are found in age group more than 10 years. It was observed that Type-1 diabetes and Type2 diabetes were higher among urban areas and FCPD and PDPD were more among rural areas. Type-1 and Type-2 diabetes were significantly associated with the family history of diabetes mellitus than FCPD and PDPD. Severely

underweight and severe stunted younger were significantly higher among the protein deficient diabetes mellitus compared to Type-2 diabetes.

Acknowledgment

There is no conflict of interest.

References

1. World Health Organization, Health situation in the South-East Asia region 1994-1997. A report of 1999; 144-6.
2. Abdullah AHM, Azad K. Diabetes mellitus in young and adolescents. Bangladesh j child health 1997; 21: 64-77.
3. Ramachandra A, Snehalatha C, Latha E, Manoharan M, Vijay V. Impacts of urbanization on the life-style and on the prevalence of diabetes in native Asian Indian population. Diabetes research clinical practice 1999; 44: 207-13.
4. Ramachandra A, Snehalatha C, Khader OMSA, Joseph TA, Vishwanathan M. Prevalence of juvenile diabetes in urban population in South India. Diabetes research and clinical practice 1992; 30:1-5.
5. Shanghai Diabetes Research Cooperative Group, A survey of diabetes mellitus among the population of Shanghai ClinMedj1981; 60: 323- 6.
6. Akerblom, HK, Reunanen A. The epidemiology of insulin dependent diabetes mellitus (IDDM) in Finland and in Northern Europe. Diabetes care 1985; 8: 10-5.
7. Cotellessa M, Barbieri P, Mazzella M, Bonassi S, Minicucci L, Lorini R. High incidence of juvenile type-1 diabetes in Liguria, Italy from 1989-1998. Diabetes care 2003; 26: 1786-9.
8. Svensson J, Carstensen B, Mølbak A, Christau B,

Juvenile Diabetes Mellitus in Bangladesh

- Mortensen HB, Nerup J, et al. Increased risk of childhood type 1 diabetes in children born after 1985. *Diabetes Care* 2002; 25:2197-201.
9. Karvonen M, Pitkaniemi J, Tuomilehto J. The onset age of type-1 diabetes in Finnish young has become younger. *Diabetes care* 1999; 22: 1066-70.
10. Kida K, Kaino Y, Nakamura K. Immunogenetics of insulin dependent diabetes mellitus. *Acta Paediatrica* 1999; 88:3-7.