International Journal of Advances in Medicine
Vyas DB et al. Int J Adv Med. 2018 Dec;5(6):1481-1484
http://www.ijmedicine.com
pISSN 2349-3925 | eISSN 2349-3933
DOI: http://dx.doi.org/10.18203/2349-3933.ijam20184761

Original Research Article

Clinical presentations of diabetes in children attending the paediatric ward in the medical institute: a cross sectional study

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Received: 06 October 2018
Accepted: 29 October 2018

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ABSTRACT

Background: By 2025, India due to its immense population size and high diabetes prevalence will contribute about 57 million diabetics. Hence the aim of the present study was clinical presentations of diabetes in children attending the paediatric ward in the medical institute.
Methods: Total of 50 cases were included in the study. All the children who were less than age of 18years and also diagnosed with diabetes that is fasting blood sugar >126mg/dl or random blood sugar level > 200 mg/dl were included in the study. A detailed clinical examination of the child was carried out with detailed anthropometric measurements. Metabolic profile was done by investigating for the following. Fasting blood sugar, post prandial blood sugar, glycoslated haemoglobin.
Results: The various ranges of fasting blood sugar were as follows: 25% were in the range of 130-200mg/dl, 35% in 200-300 mg/dl, 25% in 300-400mg/dl and 15% had more than 400 mg/dl fasting blood sugar levels. The various ranges of post prandial blood sugar were as follows: 16% were in the range of 200 - 300mg/dl, 40% in 300-400mg/dl, 44% had more than 400 mg/dl post prandial blood sugar levels. In the present study lipid profile of all the children was analysed by their serum cholesterol and triglycerides.
Conclusions: A total of 50 diabetic children of age less than 18 years attending medical Hospital were studied using a predesigned and pretested proforma. Information was collected on socio-demographic, dietary intake, treatment and compliance history. Detailed clinical examination done and anthropometric measurements were taken. Metabolic profile was done by investigating for blood sugar levels, glycoslated haemoglobin and lipid profile. In the present study 46% had onset of diabetes mellitus at 15 to 18 years age group with male to female ratio of 1.26:1.

Keywords: Children, Demographic parameters, Diabetic mellitus, Metabolic profile

INTRODUCTION

Diabetes Mellitus has been known since antiquity. The first accurate clinical description of the disease was made by Aretaeus of Cappadocia in the second century A.D., who stated "Diabetes is a wonderful affection, not very frequent among men, being a melting down of the flesh and limbs into the urine". Thomas Willis described the sweet character of the urine in diabetes in the later part of seventeenth century.[1,2]

Diabetes Mellitus (DM) is a metabolic syndrome characterized by hyperglycemia as a cardinal biochemical feature. The major forms of diabetes are divided into those caused by deficiency of insulin secretion due to pancreatic β-cell damage (type-1 DM) and those that are a consequence of insulin resistance occurring at the level

of skeletal muscle, liver, adipose tissue with various degrees of β-cell impairment (type-2 DM). Type-1 DM is the most common endocrine-metabolic disorder of childhood and adolescence.[3,4]

Worldwide, the proportion of childhood and adolescent DM attributable to type 2 DM is increasing. There is 10 folds increases in incidence of type 2 DM between 1982 and 1994.[5] The highest prevalence of type 2 DM in children and adolescents is reported among some American Indian tribes (Pima and First Nation Indians), approximately 20-35 per 1000 population in the 10-19 years age group and 50 per 1000 in the 15-19 years age group. By 2025, India due to its immense population size and high diabetes prevalence will contribute about 57 million diabetics.[6] Hence the aim of the present study was clinical presentations of diabetes in children attending the paediatric ward in the medical institute.

METHODS

Patients attending and admitted in paediatric ward in the medical institute, during the study period from august 2016 to July 2017. The present study is the cross-sectional study. Total of 50 cases were included in the study.

Inclusion criteria

- All the children who were less than age of 18years
- And diagnosed with diabetes that is fasting blood sugar >126mg/dl or random blood sugar level >200mg/dl.

Exclusion criteria

- Patients with diabetes associated syndromes such as Wolcott-Rallison syndrome, DIDMOAD syndrome (diabetes insipidus, diabetes mellitus, optic atrophy, and deafness),
- Type 2 diabetes mellitus or other causes including cystic fibrosis related diabetes (CFRD),
- Steroid-induced diabetes and lipodystrophy.

All children included in the study were studied using a predesigned and pre-tested proforma. Information was collected from the patient or attender or relative about sociodemographic profile, dietary intake and treatment history. Socio economic profile was classified according to modified B. G. Prasad's classification.

Modified Prasad's classification (per capita income in Rs. per month)

- I: 2600 and above
- II: 1300 - 2599
- III: 780 - 1299
- IV: 390 - 779
- V: Below 390

A detailed clinical examination of the child was carried out with detailed anthropometric measurements. Metabolic profile was done by investigating for the following.

- Fasting blood sugar
- Post prandial blood sugar
- Glycoslated haemoglobin

The glycemic control was labeled normal, good, fair, unsatisfactory and poor according to their glycoslated haemoglobin levels. Serum total cholesterol level of more than 200mg/dL was considered to be high and less than 200mg/dL was normal. T level of triglycerides were classified as follows: less than 150mg/dl were considered as normal, between 150-199mg/dl was considered as borderline, 200-499mg/dl was classified as high, level 500 mg/dl or higher was classified as very high.

Statistical analysis

Qualitative data will be expressed as percentages and proportions. Quantitative data will be expressed as mean and standard deviation. The differences between two groups with respect to continuous variables will be analysed using t-test while categorical variables will be analysed using chi-square test. All the statistical tests will be performed in SPSS version 15 software. P value <0.05will be considered as statistically significant while P value <0.01 will be considered as statistically highly significant.

RESULTS

The present study was conducted during the period of six months at the medical institute. Total of 50 children were included in present study. Youngest diabetic encountered in present study was 6 years old female child.

Table 1: Age of onset of diabetes mellitus.

Age group (years)	No. of cases	Percentage
0 - 4	0	0%
5 - 9	5	10%
10 - 14	22	44%
15 - 18	23	46%

Table 1 show age of onset of diabetes mellitus among the study participants. Majority of the cases (46%) had onset of diabetes mellitus in the age group of 15-18years followed by 44% in 10 to 14years, 10% in 5 to 9 years age group. 0-4years had no participants.

Table 2: Gender incidence in diabetes mellitus.

Sex	No. of cases	Percentage
Male	28	56%
Female	22	44%

Table 2 shows the gender incidence in diabetes mellitus among the study participants. In the present study male preponderance was noted (55.88%) with male:female ratio of 1.26:1.

Table 3: Duration of diabetes mellitus.

Duration	No. of cases	Percentage
Newly diagnosed	16	32%
< 1 years	10	20%
1 - 2 years	8	16%
2 - 3 years	7	14%
3 - 4 years	6	12%
4 - 5 years	3	6%

Table 3 shows duration of diabetes mellitus among the study participants. 16 children were newly diagnosed as diabetic during present study and remaining cases were diagnosed earlier and were on the treatment. In the remaining 20% had less than 1 year of diabetic duration, 16% of the cases had 1 to 2 years, 14% had 2 to 3 years and 12% had 3 to 4 years and 6% had 4 to 5 years of duration.

The various ranges of fasting blood sugar were as follows: 25% were in the range of 130 - 200mg/dl, 35% in 200 - 300mg/dl, 25% in 300 - 400mg/dl and 15% had more than 400 mg/dl fasting blood sugar levels. The various ranges of post prandial blood sugar were as follows: 16% were in the range of 200 - 300mg/dl, 40% in 300 - 400mg/dl, 44% had more than 400mg/dl post prandial blood sugar levels. In the present study lipid profile of all the children was analysed by their serum cholesterol and triglycerides. No child had hypercholesterolemia (>200mg/dL). 75% children had triglyceride levels below 150mg/dL, 24% were in the range of 150 - 199 and one child had high level of triglycerides.

DISCUSSION

Type 1 diabetes mellitus (T1DM) accounts for the majority of cases of diabetes Mellitus (DM) in children. It is caused by autoimmune destruction of the insulin-producing cells of the pancreas. The destruction may take place over a period of many years. Large proportions (over 80%) of the β cells are destroyed by the time clinical symptoms appear. Diabetes mellitus is one of the chronic diseases of children and youth worldwide. Very little is known about the magnitude or determinants of childhood and youth onset diabetes in India.

The classic presentations of T1DM in children are polyuria, polydipsia, and weight loss. A significant number of patients may present with diabetic ketoacidosis (DKA) which carries a significant risk of mortality to these children. Associated autoimmune diseases with T1DM mainly include celiac and thyroid diseases. The prevalence of biopsy proven celiac disease in Omani children with T1DM was documented to be 5.5%.[7-10]

In the present study peak incidence was in age group of 15-18years (46%).[11] Male predominance was encountered as compared to female. In a similar studies peak age at diagnosis was 11 years in girls and between 11 to 18years in boys and female predominance was present. Equal gender distribution in the prevalence of childhood DM has been documented by some researchers in some African countries such as Tanzania and Tunisia.[12,13] Female preponderance, however, was reported by some other African researchers in Nigeria, South Africa, and Ethiopia while a group of others in Nigeria and Ethiopia reported male preponderance.[14-16]

However significant correlation was found with the duration of diabetes. Low socio-economic level is related to poor glycemic control. Factors such as attitude of treatment teams, self-care behaviours, education or patient satisfaction may be more directly related to outcomes than the insulin regimens.

In the present study lipid profile of all the children was analysed by their serum cholesterol and triglycerides. No child had hypercholesterolemia (>200mg/dL) or high levels of triglycerides (>200mg/dL). These findings were similar with the lipid profile of the study at Chennai. Increased levels of cholesterol and triglycerides are more commonly associated with type 2 diabetes mellitus.

CONCLUSION

A total of 50 diabetic children of age less than 18 years attending medical Hospital were studied using a predesigned and pretested proforma. Information was collected on socio-demographic, dietary intake, treatment and compliance history. Detailed clinical examination done and anthropometric measurements were taken. Metabolic profile was done by investigating for blood sugar levels, glycoslated haemoglobin and lipid profile. In the present study 46% had onset of diabetes mellitus at 15 to 18years age group with male to female ratio of 1.26:1.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Vyas DB, Thacker V. Clinical presentations of diabetes in children attending the paediatric ward in the medical institute: a cross sectional study. Int J Adv Med 2018;5:1481-4.