

Profile of Adolescent Diabetics in North Indian Population

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Abstract: Diabetes mellitus is one of the commonest endocrine and metabolic diseases of childhood. Till recently, diabetes in children (defined as onset below 12 years) and adolescents (defined as onset between 12 and 19 years) was almost exclusively type 1 diabetes (T1DM) and this has changed, as there is increased recognition of a number of different forms of “non-type 1 diabetes” in the young. This includes type 2 diabetes (T2DM), maturity onset diabetes of young (MODY), fibrocalculous pancreatic diabetes (FCPD) and diabetes due to genetic disorders. There is scarcity of epidemiological data about prevalence and as to the profile, type of diabetes in adolescents in our population. Hence, present study was designed to study the clinical profile and laboratory assessment of 80 newly enrolled adolescents with diabetes.

Introduction

Diabetes is one of the most common chronic diseases in children and adolescents. About 151,000 people below the age of 20 years have diabetes.¹ The prevalence of youth-onset type 2 diabetes is increasing worldwide in parallel with the obesity epidemic. When diabetes strikes during childhood, it is routinely assumed to be type 1 (T1DM), or juvenile-onset diabetes. However, in the last two decades, type 2 diabetes (T2DM), which was formerly known as adult-onset diabetes, has been reported frequently in childhood. In India, the age at onset of type 2 diabetes had traditionally been a decade or two earlier compared with the western population.¹ Hence, it is not surprising that the prevalence of youth-onset type 2 diabetes is rapidly escalating in India not only among the more affluent sections of society but also in the middle and lower socioeconomic groups as well. A large multicenter study showed that T1DM is the commonest form of diabetes in childhood. T2DM is the next most common kind, while chronic pancreatitis-related diabetes is uncommon.²

In India, T2DM in youth overlaps with monogenic forms of diabetes such as maturity-onset diabetes of the young, fibrocalculous pancreatic diabetes, and malnutrition-

modulated diabetes, all of which are ketosis-resistant forms of youth-onset diabetes.¹ Screening of high-risk groups may help in the early detection of youth-onset T2DM and prevention of its complications.

Aims and Objectives

There is scarcity of epidemiological data about prevalence and to the profile, type of diabetes in adolescents in our population. Hence, present study was designed to study the clinical profile and laboratory assessment of 80 newly enrolled adolescents with diabetes.

Materials and Methods

In this study, 80 adolescents with diabetes who got newly enrolled at North Delhi Diabetes Centre, Rohini, New Delhi, between August 2011 to August 2012, were evaluated clinically. This adolescent group was divided into two groups based on their age – 12–18 years and 18–25 years. Their clinical profiles were matched and compared with 80 diabetic patients in the age group of >25 years who worked as controls.

Their clinical profiles namely age, sex, mean duration of diabetes, personal habits (smoking, dietary habits) were evaluated. Weight, height, and hip and waist circumferences were measured wearing only light clothes. Obesity in children and adolescents was defined using age- and sex-specific normograms for body mass index (BMI). Children with BMI equal to or exceeding the age-gender-specific 95th percentile were defined obese.² Those with BMI equal to or exceeding the 85th but below 95th percentiles were defined overweight.³

Prehypertension was defined as systolic or diastolic blood pressure between the 90th and 95th percentile for their age. Adolescents having blood pressure >120/80 mmHg but below the 95th percentile were included in this category. Hypertension was defined as systolic or diastolic blood pressure exceeding the 95th percentile for age, gender, and height, on at least three separate occasions, 1–3 weeks apart.⁴

These patients were also evaluated for the presence of microalbuminuria, retinopathy, (posterior vitreous detachment) PVD, and dyslipidemia. Neuropathy was assessed using a Siemmens-Weinstein 10 g filament over 10 areas of the feet, ankle reflexes, and vibration perception over the great toe and ankle.

Retinopathy was assessed by dilated direct and indirect ophthalmoscopy. Microalbuminuria was defined when two out of three albumin excretion ratio (AERs) were 30–300 mg/L in the absence of other causes.

Results

The demographic profile of the study group is shown in Table 1.

The complication profile is shown in Table 2.

Discussion

T1DM is the most common form of diabetes in children in western countries. There have been no large studies of childhood diabetes from India. We undertook this study to assess the proportion of various subtypes of diabetes among the young subjects presenting to our center in North Indian population. In addition, we compared the clinical features of T1DM and T2DM in Indian subjects. Patients with onset of disease at younger age between 12–18 years and 18–25 years were included in this study. Their clinical profile were matched and compared with 80 diabetic patients in the age group of >25 years who worked as controls. Compared to those with T2DM, subjects with T1DM were younger. About 90% of patients in the younger age group <18 years and about 80% in age >18–25 years were T1 diabetics, while 90% patients in the age group >25 years were T2 diabetics.

Conclusion

About 90% of patients in the younger age group <18 years and about 80% in the age group >18–25 years were T1 diabetics, while 90% patients in the age group >25 years were T2 diabetics.

T2 Diabetics in age group >25 years had much higher BMI (>24.5). So probably obesity was the causative factor for early onset T2DM in this young age group. As expected, T2 diabetics in >25 years group had family history of DM in 88%, but surprisingly even T1 diabetics in younger age group <18 years also had one of the first or second degree relation as diabetic in 66%. Large number of MODY were seen in >18–25 years (11%) and in the age >25 years group (6%). Here 50% patients had hypertension and dyslipidemia in age group >25 years.

Table 1 | Demographic details

Age group (years)	No of patients	Type of DM	Presentation glycosuric symptoms	Duration of DM <5 years	Sex	Family history of DM	Diet (kcal) consumed in no of patients	BMI
12–18	36	T-1 33 T-2 2 MODY 1	29 7	31 5	M 22 F 14	22	<1500 2 >1500 34	19.2
18–25	44	T-1 20 T-2 19 MODY 5	34 10	28 16	M 32 F 12	33	<1500 4 >1500 40	20.3
>25	Controls N=80	T-1 3 T-2 72 MODY 5	40 40	40	M 47 F 33	63	<1500 5 >1500 75	24.5

Age group years	Hypertension	Lipids (mg%) in no of patients	Peripheral neuropathy	Retinopathy	Microalbuminuria
12–18	1	LDL>130 2 HDL<40 2	–	–	4
18–25	14	LDL>130 8 HDL<40 6 TGS>150 7	9	2	23
>25	40	LDL>130 42 HDL<40 15 TGS>150 26	32	22	34

About 25–40% had some microvasculopathy in age group >25 years (retinopathy and peripheral neuropathy/microalbuminuria, respectively) suggesting the linear relationship with duration of disease.

Recommendations

Even adolescent patients need to be investigated for the presence of microvasculopathy (diabetic retinopathy, peripheral neuropathy, microalbuminuria), may be at the time of diagnosis and every year thereafter.

Family history of DM is quite common in adolescent age group. So family members of diabetics need to be screened at age of 25 years or so, especially if overweight. Height and dyslipidemia being quite common even in these adolescents, they are at higher risk for macrovascular disease also.

There is a need to develop an initiative to help healthcare providers to identify, diagnose, and treat children and teens with type 2 diabetes. In addition, it is also important to launch an initiative to increase awareness in the school setting about the importance of helping children and teens with diabetes to manage their disease.

References

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