Clinical and sociodemographic profile of type 1 diabetes mellitus cases in a tertiary care hospital of North India

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Abstract: Background: Type 1 diabetes is one of the most common chronic metabolic diseases in childhood and adolescence[1] and its prevalence is rapidly increasing throughout the world.[2] The objective of this study is to determine the clinical and socio demographic profile of type 1 diabetes mellitus (T1DM). *Material and Methods*: This descriptive cross-sectional study was conducted at Guru Teg Bahadur Hospital, Delhi. A total of 156 adolescents aged between 13 to 19 years old diagnosed with T1DM were included in the study. Data was collected via structured questionnaire and medical records of patients attending diabetic clinic at the time of follow up in outpatient department. After getting an informed consent following data were collected sociodemographic features like age, sex, economic status, family history of parents, details of feeding habits in child hood, existing comorbidities etc. Investigations like HBA1C, cholesterol and triglycerides were obtained. A descriptive analysis was done by SPSS software and results are expressed in percentages, scatter charts, linear charts, column charts and pie charts. *Results*- Out of 156, majority of adolescents were males 87 (55.7%). The median age of onset of type 1 diabetes was 11 years with a range of (8-13). 113 (72.4%) adolescents were residing in urban area. Majority of them 52 (33.3%) has studied up to middle class, were Hindu 126 (80.7%). Regarding socio economics status, 54 (34.6%) adolescents having a family income between 20,001- 30,000 Rs per month followed by 52 (33.3%) Rs per month. Polyuria 77 (49%) was found to be the commonest symptom followed by polydipsia 34 (22%), weight loss 23 (15%) and polyphagia 22 (14%), 60% presented with diabetic ketoacidosis as presenting symptom. Majority of the participants were administering insulin through the syringe 113 (72.4%) and 106 (68%) had positive family history of diabetes. 56 (36%) has been hospitalized in last six month, among them 51 (91%) got admitted due to diabetes ketoacidosis. Mean Glycosylated hemoglobin (HbA1c) value was 10.3±2.4.On studying the breastfeeding of adolescents out of 156 cases 97 (62.1%) had exclusive breastfeeding till 5th month. 13 (8.3%) were having short stature, 18 (11.5%) have abnormal T3, T4 hormone levels. The median body mass index was 18.7 (16.3-20.5), weight was 42 kg (35-48) and height was 152 cm (142-158).

Conclusion: Polyuria was the most common presenting symptom followed by polydipsia, weight loss and polyphagia. Moreover, most of the children had landed up in diabetic keto-acidosis (DKA) at the time of diagnosis. Therefore, awareness programme should be done in rural community for parents and health care professionals regarding T1DM for early recognition and prompt treatment.

Keywords: Type 1 diabetes mellitus(DM), Sociodemographic, Clinical Profile, Symptoms

INTRODUCTION

Type 1 diabetes is one of the most common chronic metabolic diseases in childhood and adolescence[1] and its prevalence is rapidly increasing throughout the world.[2] It can be diagnosed at any age; peaks in onset occur between 5 years and 7 years of age and at or near puberty.

It has been estimated that one in every 300-400 adolescents has type 1 diabetes.[3] T1DM accounts for ~10% of all diabetes cases, and the incidence rate of childhood T1DM has risen worldwide by ~2.8%–4.0% each year in all age groups in the last several decades.[4] It is estimated that India is housing about 97,700 children with type 1 diabetes mellitus (T1DM).[5] The Karnataka state T1DM registry listed an incidence of 3.7/100,000 in boys and 4.0/100,000 in girls over 13 years of data collection.[6]

Due to lack of awareness related to type 1 diabetes mellitus especially in rural areas; symptoms of diabetes are usually ignored resulting in delayed hospital visit leading to serious complications like diabetic ketoacidosis. The health care professionals may also miss these symptoms when children present with other comorbid conditions.

The goal of this study is to increase awareness of parents and health professionals regarding the symptoms of diabetes in children, which may prevent serious complications.

MATERIAL AND METHODS

This descriptive cross-sectional study was conducted at Guru Teg Bahadur Hospital, Delhi. A total of 156 adolescents aged between 13 to 19 years old diagnosed with T1DM and were willing to participate included in the study. Data was collected via structured questionnaire and medical records of patients attending diabetic clinic at the time of follow up in outpatient department. After getting an informed consent following data were collected sociodemographic features like age, sex, economic status, family history of parents, details of feeding habits in childhood, existing comorbidities etc. Investigations like HBA1C, cholesterol and triglycerides were obtained. Data on insulin regimens, self-blood glucose monitoring (SMBG), and acute and chronic complications were recorded. A descriptive was done by SPSS software and results are expressed in percentages, scatter charts, linear charts, column charts and pie charts.

RESULTS

More than half of the study population was male 87 (56%). 43 (27.56%) adolescents were residing in rural area and 113 (72.44%) were residing in urban areas. Majority of them 52 (33.33%) has studied up to middle class, were Hindu 126 (80.77%). Regarding socioeconomic status, 54 (35%) adolescents having a family income between 20,001- 30,000 Rs per month followed by 52 (33.3%) having family income between 10,000-15,000 Rs per month. The median age of onset of type 1 diabetes was 11 years with a range of 8 to 13 years. 66 (42.3%) were having 3 meals one snack followed by 36 (23%) who had 3 meal and 2 snacks. 113 (72.4%) were administering insulin through the syringe. Majority of the adolescents 145 (93%) were storing insulin in fridge, 106 (68%) had positive family history of diabetes, 56 (36%) has been hospitalized in last six months, among them 51 (91%) got admitted due to diabetes ketoacidosis. 13 (8.3%) adolescents were having short stature, 9 (6%) had hypothyroidism, 9 (6%) had hyperthyroidism.

Out of 156 cases, 97 cases had exclusive breastfeeding till 5th month. Out of 69 females, 47 (68.12%) had menstrual issues. 13 (8.33%) were having short stature, 18 % have abnormal T3, T4 hormone levels 145 (92.95%) were physically active. The median body mass index was 18.7 (16.3-20.5), weight was 42 kg (35-48) and height was 152 cm (142-158). Polyuria 77 (49%) was found to be the commonest symptom followed by polydipsia 34 (22%), weight loss 23 (15%) and polyphagia 22 (14%).

60% presented with diabetic ketoacidosis as presenting symptom at the time of diagnosis. Polyuria, polydipsia and weight loss are the predominant presenting symptoms in these cases. Mean Glycosylated hemoglobin (HbA1c) value was 10.3±2.4. More than half, 68%, of our patients had normal level of total cholesterol.

DISCUSSION

The median age of adolescents in the current study was 16 years (14-17), which is similar to Coates V et al[7] in which 76.1% of participants were aged 16 years or below and dissimilar to Sawtell M et al[8], in the age range 8 to 16 years. The median age of onset of diabetes was 10.5 years (8-13) in the present study which is more than Kumar et al[9] was 7.2 years (range 1.5–12.8 years) and Whittemore R et al[6] in which mean duration of diabetes was 6.1 (±3.5) years. In the present study, there was male preponderance which is similar to Farsana et al[10] and in dissimilar to other studies.[11,12] In present study, BMI was 18.7 (16.3-20.5), weight was 42 kg (35-48) and height was 152 (142-158) which is in discordance with Coates V et al[1] findings for BMI (22.97±3.45) and (23.05± 4.22), weight was (63.19 ±11.52) kg and (63.08±12.3) kg and height was (166±10) cm and (165±9) cm for experimental and control group respectively.

CONCLUSION

Polyuria was the most common presenting symptom followed by polydipsia, weight loss and polyphagia. Moreover, most of the children had landed up in diabetic keto-acidosis (DKA) at the time of diagnosis. Therefore, awareness programme should be done in rural community for parents and primary health care workers regarding T1DM for early recognition and prompt treatment.

Table 1- Demographic and sociodemographic variables (N=156)

Religion	Total
Hindu	126 (81%)
Muslim	25 (16%)
Christian	1 (0.6%)
Others	4 (2.5%)
Gender	
Female	69 (44.2%)
Male	87 (56%)
Habitat	
Rural	43 (55.1%)
Urban	113(72.4%)
Education status	
Illiterate	10 (6.4%)
Upto primary	15 (9.6%)
Upto middle	52 (33.3%)
Upto senior	34 (22%)
Upto senior secondary	45 (29%)
Socio economic status	
Rs.≥ 20,001-300	54 (35%)
Rs.15,001-20,000	44 (28.2%)
Rs.10,001-15,000	52 (33.3%)
Rs.5001 to 10000	4 (2.5%)
Rs.<5000	2 (1.2%)
Meal frequency	
2 meals	7 (4.5%)
2 meals + 1 snack	12 (8%)
2 meals + 2 snacks	3 (2%)
3 meals	14 (9%)
3 meals + 1 snack	66 (42.3%)
3 meals + 2 snacks	36 (23%)
3 meals + 3 snacks	18 (11.5%)
Insulin administration	
Pen	27 (17.3%)
Syringe	113 (72.4%)
Pen and syringe	16 (10.2%)
Insulin storage	
Mud Pot	11 (7.%)
Refrigerator	145 (93%)
Family history	**Total**
No	50 (32%)
Yes	106 (68%)
Total	156 (100%)

Table 2- Anthropometric parameters of type 1 diabetes mellitus

Anthropometric parameters	Value
Body mass index(kg/m²)	18.7(16.3-20.5)
Weight(kg)	42(35-48)
Height(cm)	152(142-158)

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