Original Article

Diabetes Mellitus Type 1 in Pediatric Patients

Clinical Profile of Diabetes Mellitus Type 1 in Pediatric Patients Admitted in PMCH Nawabshah

Ali Akbar Siyal[1], Juverya Naqvi[1] and Tabinda Taqi[2]

ABSTRACT

Objective: To look at the frequency of children having type 1 diabetes mellitus and their clinical profile.
Study Design: Observational study
Place and Duration of Study: This study was conducted at the Pediatric Ward, Peoples Medical College Hospital, Nawabshah from November 2016 to October 2017.
Materials and Methods: Files of patients with either diagnosis at admission as diabetes mellitus type 1 or later diagnosed as diabetes mellitus type 1 during hospital stay were collected and data was retrieved regarding gender, age, number of days in hospital, presentation, type of insulin used, and acute complications developed if any.
Results: Total patients admitted in ward 10554 from November 2016 to October 2017, age ranging from 1 year to 15 years. Out of these10554, 57 patients were treated as having type 1 diabetes mellitus, with a mean age of 7.5 years, the female were 61%. Mode of presentation was Diabetic ketoacidosis (DKA) in 50 patients, and 7 patients were diagnosed incidentally during stay at hospital for some other disease. 1 Patient developed cerebral edema during DKA management, 3 patients developed episodes of hypoglycemia, rest of the patients were discharged without complication.
Conclusion: Diabetes mellitus type 1 in recent years has found to be an increased concern in pediatric population. In our patients it was found to be present in0.54% admitted patients. But there is a limitation of this study that it does not depicts the actual ice berg situation of this illness in our population.
Key Words: Diabetes Mellitus, Children, DKA

Citation of articles: Siyal AA, Naqvi J, Taqi T. Clinical Profile of Diabetes Mellitus Type 1 in Pediatric Patients Admitted in PMCH Nawabshah. Med Forum 2018;29(11):2-4.

INTRODUCTION

Diabetes mellitus (DM) is a chronic disease which is characterized by hyperglycemia. The main forms of the disease are differentiated by insulin deficit versus insulin resistance type 1 diabetes mellitus (T1DM) resulting from lack of insulin because of β-cell damage of pancreas. The type 2 diabetes mellitus (T2DM) is a consequence of insulin resistance that occurs in skeletal muscle, liver, and adipose tissue, with several degrees of impairment in β-cell. T1DM is the commonest metabolic condition of endocrine system in children and adolescence, with important consequences for physical and emotional development[1].T1DM is the commonest among chronic metabolic diseases in children, resulting in 5–10% of the total cases of Diabetes worldwide[2]. A recent increase in non-communicable diseases (NCDs) has been observed worldwide, diabetes mellitus being one of them. Even in developing and under developed countries there has been an increase in diabetes mellitus in young adults, adolescents and children. It is documented that NCDs is killing about 15 million people yearly having age between 30 and 69 years, particularly in countries of low and lower-middle income, with almost 50% of reported premature deaths[3].There are many factors that influence an individual's risk for development of diabetes mellitus including the micro and macro-environment, exercise/ activity levels, genetic propensity and many others yet to be identified risk factors. A study done at Basrah, Iraq which shows the prevalence of T1DM in 0-40 years was 87/100000[4]. Diabetes mellitus has a major social and psychological effect on children and parents, as well as has impact on health care facilities too, if left untreated it causes chronic complication and ultimately decreases the life expectancy[5,6]. There is great variability in the initial appearance of T1DMequally in youth and adults. The disease is often acute in children, with stern symptoms of polyuria, polydipsia, and ketonemia[7], but it is also observed that sometimes patients come with other presenting complain and then are diagnosed

[1.] Department of Pediatric Medicine / Physiology[2], Peoples University of Medical & Health Sciences, Nawabshah.

Correspondence: Ali Akbar Siyal, Professor and Chairman, Department of Pediatric Medicine, Peoples University of Medical & Health Sciences, Nawabshah.
Contact No: 0300-3283727
Email: profakbarsiyal@gmail.com

Received by: March, 2018
Accepted by: August, 2018
Printed by: November 2018

incidentally. There is a massive lack of data and research regarding the prevalence and clinical profile of T1DM in individuals less than 15 years of age in our region. This paper is just an effort in this regard to look at the clinical profile of T1DM in children admitted in pediatric unit, PMCH, Nawabshah.

MATERIALS AND METHODS

Files of patients admitted in pediatric ward PMCH Nawabshah as diabetes mellitus type 1 or later diagnosed as diabetes mellitus type 1 during hospital stay were collected and data was retrieved regarding gender, age, number of days in hospital, presentation, type of insulin used, and acute complications developed if any.

RESULTS

Total patients admitted in ward 10554 from November 2016 to October 2017,age ranging from 1 year to 15 years. Out of these10554, 57 patients were treated as having T1DM with mean age of 7.5 years, and female patients' percentage to be higher than male patients (61% vs. 39%). Mode of presentation was Diabetic ketoacidosis (DKA) in 50 patients, and 7 patients were diagnosed incidentally during stay at hospital for some other disease.1 Patient developed cerebral edema during DKA management, 3 patients developed episodes of hypoglycemia, rest of the patients were discharged without complication.

Table No.1: Percentage of Patients Presenting With DKA

Total Number:	DKA		Percentage
	Yes	No	
57	50	7	87.7%

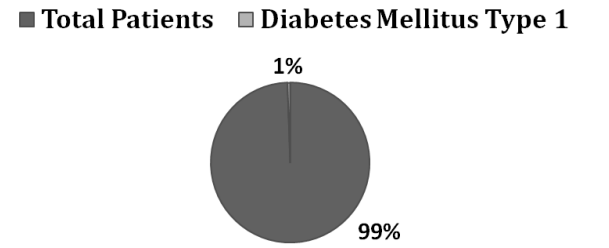

Figure No.1: Percentage of Diabetes Mellitus Type 1 in Patients Presenting to Paediatric Ward

Figure No.2: Gender Distribution of Type 1 Diabetes Mellitus

DISCUSSION

In the current study done at the pediatric unit, authors found that the prevalence/frequency of type 1 diabetes mellitus was 57 out of 10554 admitted patients between the ages of 1 year to 15 years. Patients presenting in outpatient department are not included in our study. In a study from Bangladesh the number of patients with type 1 diabetes was 125, age ranges from 1 to 18 years[8]. Another study from Haryana state Karnal district India reports prevalence of10.20/100,000 population, In the 5 to 16 years age group, the prevalence is 22.22/100,000, while in the 0-5 years age group, prevalence is 3.82/100,000, but this is a population based study, ours was a hospital based study with limited population[9]. In our study the mean age of presentation was 7.5 years, the youngest patient noted was 2 years old, different studies have different population age ranges, in one study from Al-Madina Saudi Arabia, mean age at presentation was 6.9 years[10], but few studies match the average age with our study's mean age[11,12]. Our study shows female predominance (61%) rather than males, studies from India and USA shows a male predominance[9, 13]. Female predominance was seen in a study from Cyprus Greece[14] in age group 10-15 years. In our study 87.71% patients presented with DKA, while 12.3% patients landed with some other complaints but were later on diagnosed with diabetes type 1 or were admitted for adjustment of insulin dose. In a large cohort study from UK, authors found that the diabetic children presenting with DKA ranged from 12.8% to 80%[16], the reason of majority of patients landing in emergency department with DKA in our setup in most of the patients was poor compliance, or inappropriate management in sick days because not all patients were newly diagnosed, some of them were known case of diabetes and counseled thoroughly but they presented with DKA again and again[12,15]. As majority of type 1 diabetes patients present with diabetic ketoacidosis, there is higher incidence of DKA related complications like cerebral edema[16, 17], but in our small cohort of 57 patients only 1 patient (1.7%) developed brain edema during the in initial phase of treatment. Hypoglycemia is again a life threatening morbidity associated with management of diabetes mellitus type 1, as during initial management there is a high risk of hypoglycemia that develops insidiously and suddenly, our study shows that symptomatic hypoglycemia developed in 5.26% patients, in a study from USA hypoglycemia was seen in young patients especially younger than 6 years of age[18]. To prevent the development of DKA and DKA related complications in our setting; we have to ensure that patients and their parents/guardians understand the importance of the need for regular insulin injections with proper dose calculation and monitoring of blood glucose. This can be made sure by patient and parent education on each visit especially when they are admitted for the first time and ensure their regular follow ups. It is also important to educate them about sick-day management[20]. There is also a strong need to spread the knowledge about

diabetes and DKA to community physicians and general population who are involved in care of diabetes mellitus in children.

CONCLUSION

The prevalence of Diabetes mellitus type 1 is increasing in younger age pediatric population. In our patients it was found to be present in 0.54% admitted patients. Most of patients develop DKA and DKA related complications.

Author's Contribution:

Concept & Design of Study:	Ali Akbar Siyal
Drafting:	Juverya Naqvi
Data Analysis:	Tabinda Taqi
Revisiting Critically:	Ali Akbar Siyal, Juverya Naqvi
Final Approval of version:	Ali Akbar Siyal

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Kliegman R, Stanton B, St. Geme JW, Schor NF, Behrman RE. Nelson textbook of pediatrics. 20th ed. Elsevier: Phialdelphia;2016.p.1763-95.
2. Daneman D, Type 1 diabetes. Lancet 2006; 367(9513):847-58.
3. WHO Independent Global High-level Commission on NCDs. http://www.who.int/ncds/governance/high-level-commission/en/
4. Almahfoodh D, Alabbood M, Alali A, Mansour A. Epidemiology of type 1 diabetes mellitus in Basrah, Southern Iraq: A retrospective study. https://doi.org/10.1016/j.diabres.2017.09.001
5. Brussels, Belgium: International Diabetes Federation; 2013. [Last accessed on 2014 Sep 17]. International Diabetes Federation. IDF Diabetes Atlas. Available from: http://www.idf.org/diabetesatlas.
6. Kumar KMP, et al. Type 1 diabetes: Awareness, management and challenges: Current scenario in India. Ind J Endocrinol Metab 2015;19(Suppl 1): S6–S8.
7. Davis A, Haller MJ, Miller K, et al. Residual C-peptide in patients 3-81 years from diagnosis of T1D: A T1D Exchange Study. Diabetes 2013; 62(Suppl.1):A422.
8. Mohsin F, Zabeen B, Rzinnat R, Azad K, Nazmun N. Clinical Profile of Diabetes Mellitus in Children and Adolescents under Eighteen Years of Age. 2007. Ibrahim Med Coll J 10.3329/imcj.v1i1.2889.
9. Kalra S, Kalra B, Sharma A. Prevalence of type 1 diabetes mellitus in Karnal district, Haryana state, India. Diabetol Metabolic Syndrome;2010:2:14
10. Magamsi MS, Habib HS. Clinical presentation of childhood type 1 diabetes mellitus in the Al-Madina region of Saudi Arabia 2004;5(2):95–8.
11. Kanwal SK, Bando A, Kumar V. Clinical profile of diabetic ketoacidosis in Indian children. Ind J Pediatr 2012 Jul;79(7):901-4
12. Syed M., Khawaja F, Saleem T, Khalid U, Rashid A, Humayun K. Clinical profile and outcomes of paediatric patients with diabetic ketoacidosis at a tertiary care hospital in Pakistan. J Pak Med Assoc 2011;61(11):1082-7.
13. Valencia PAZ, Bougnères P, Valleron AJ. Global epidemiology of type 1 diabetes in young adults and adults: a systematic review. BMC Pub Health 2015;15:255.
14. Skordis N, et al. Epidemiology of type 1 diabetes mellitus in Cyprus: rising incidence at the dawn of the 21st century. Hormones (Athens) 2012; 11(1):86-93.
15. Lone SW, Siddiqui EU, Muhammad F, Atta I, Ibrahim MN, Raza J. Frequency, clinical characteristics and outcome of diabetic ketoacidosis in children withtype-1 diabetes at a tertiary care hospital. J Pak Med Assoc 2010;60: 725-9.
16. Usher-Smith JA, Thompson M, Ercole A, Walter FM. Variation between countries in the frequency of diabetic ketoacidosis at first presentation of type 1 diabetes in children: a systematic review. Diabetologia 2012;55(11):2878-94.
17. Perrin C, White Bryan A, Dickson. Low Morbidity and Mortality in Children with Diabetic Ketoacidosis Treated with Isotonic Fluids. J Pediatr 2013;163(3):761-66.
18. Dunger DB, Sperling MA, Acerini CL, Bohn DJ, Daneman D, Danne TP, et al. European Society for Paediatric Endocrinology/ Lawson Wilkins Paediatr Endocrine Society consensus statement on diabetic ketoacidosis in children and adolescents. Paediatr 2004;113:e133-40.
19. Cengiz E et al. Severe hypoglycemia and diabetic ketoacidosis among youth with type 1 diabetes in the T1D Exchange Clinic Registry 2013;14(6): 447–54.
20. Bismuth E, Laffel L. Can we prevent diabetic ketoacidosis in children? Pediatr Diabetes 2007;8 (Suppl 6): 24-33.