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To determine glycaemic level and complications in patients with type I DM

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Abstract

Background: Type 1 diabetes is the most common type in children. The present study was conducted to determine glycaemic level and complications in patients with type I DM.

Materials & Methods: The present study was conducted on 132 children age ranged 4-12 years of both genders. In all patients, glycosylated hemoglobin level as well as complications arising from diabetes was recorded.

Results: Out of 132, males were 74 and females were 58. In males HbA1c level was 8.7 and in females was 8.2, patients on regular follow up was 8.6 and on irregular follow up was 8.4, rural patients had 8.9 and urban had 8.3. The difference was non-significant ($P > 0.05$). Common complications in patients were non-proliferative diabetic retinopathy in 12, proliferative diabetic retinopathy in 10, diabetic nephropathy in 4 and hypertension in 5. The difference was significant ($P < 0.05$).

Conclusion: Authors found that 132 children had type 1 DM. Common complications were non-proliferative diabetic retinopathy, proliferative diabetic retinopathy, diabetic nephropathy and hypertension.

Keywords: Diabetic retinopathy, diabetic nephropathy, Type I DM.

Introduction

Type 1 diabetes is the most common type in children, accounting for two thirds of new cases in children of all ethnic groups. It is one of the most common chronic childhood diseases, occurring in 1 in 350 children by age 18; the incidence has recently been increasing, particularly in children <5 yr. Although type 1 can occur at any age, it typically manifests between age 4 yr and 6 yr or between 10 yr and 14 yr^[1].

Prevalence studies in expatriate Indians residing in UK report a prevalence of T1DM in South Asians of 0.54 per 1000 population, compared to 0.99 per 1000 population in the local European population. With regard to the internationally observed rising incidence of T1DM, especially in young children, many studies suggest rising incidence rates in expatriate South^[2].

Youth with T1DM must adhere to a complex and time-consuming lifelong daily medical regimen to delay or prevent the onset of acute and chronic T1D-related complications such as seizure, coma, diabetic ketoacidosis, cardiovascular disease, retinopathy, nephropathy, and neuropathy^[3]. Parents of young children with T1DM are responsible for their child's daily T1DM management, including frequent blood glucose (BG) monitoring, insulin administration, and diet/physical activity regulation^[4]. The present study was conducted to determine glycaemic level and complications in patients with type I DM.

Materials & Methods

The present study was conducted in the department of Pediatrics. It comprised of 132 children age ranged 4-2 years of both genders. All were informed regarding the study and written consent was obtained. Ethical approval was obtained prior to the study.

Data such as name, age, gender etc. was recorded.

Diagnosis of T1DM was made if polyuria and weight loss were present at onset, ketones were documented at any time, or insulin continued to be required for glycemic control beyond one year of diagnosis. In all patients, glycosylated hemoglobin level as well as complications arising from diabetes was recorded.

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Results

Table 1: Distribution of patients

Total- 132		
Gender	Males	Females
Number	74	58

Table I shows that out of 132, males were 74 and females were 58.

Table 2: Glycemic control in children

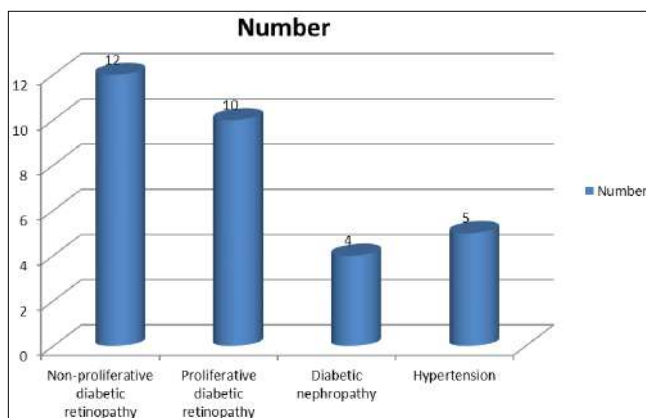
Parameters	HbA1c	P value
Male	8.7	0.42
Female	8.2	
Regular follow up	8.6	0.12
Irregular follow up	8.4	
Rural	8.9	0.51
Urban	8.3	

Table II shows that in males HbA1c level was 8.7 and in females was 8.2, patients on regular follow up was 8.6 and on irregular follow up was 8.4, rural patients had 8.9 and urban had 8.3. The difference was non- significant ($P > 0.05$).

Table 3: Complications in patients

Parameters	Number	P value
Non-proliferative diabetic retinopathy	12	0.01
Proliferative diabetic retinopathy	10	
Diabetic nephropathy	4	
Hypertension	5	

Table III, graph I shows that common complications in patients were non-proliferative diabetic retinopathy in 12, proliferative diabetic retinopathy in 10, diabetic nephropathy in 4 and hypertension in 5. The difference was significant ($P < 0.05$).



Graph 1: Complications in patients

Discussion

It is found that approximately 69% of young children experience a temporary restoration of beta cell function (i.e. honeymoon period) as a result of insulin therapy, during which less insulin is required. Yet, 90% of young children no longer fall into this category 12 months post-diagnosis. Thus, parents must quickly adapt to a new T1DM regimen and changing physiological needs [5]. Young children also exhibit increased insulin sensitivity, susceptibility to hypoglycemia, and potentially long-term neuropsychological effects due to difficulties meeting

treatment goals and longer disease duration. The burden of T1DM management and resulting parental worry about acute and chronic complications likely contributes to daily BG management challenges and parent stress. Prevalence of microvascular complications has been found to be variable among Indian studies on pediatric onset T1DM [6].

In type 1 diabetes, initial manifestations vary from asymptomatic hyperglycemia to life-threatening diabetic ketoacidosis. However, most commonly, children have symptomatic hyperglycemia without acidosis, with several days to weeks of urinary frequency, polydipsia, and polyuria.⁷ Polyuria may manifest as nocturia, bed-wetting, or daytime incontinence; in children who are not toilet-trained, parents may note an increased frequency of wet or heavy diapers. About half of children have weight loss as a result of increased catabolism and also have impaired growth. Fatigue, weakness, candidal rashes, blurry vision (due to the hyperosmolar state of the lens and vitreous humor), and/or nausea and vomiting (due to ketonemia) may also be present initially [8].

In present study, out of 132, males were 74 and females were 58. We found that in males HbA1c level was 8.7 and in females was 8.2, patients on regular follow up was 8.6 and on irregular follow up was 8.4, rural patients had 8.9 and urban had 8.3.

Eppens *et al.* [9] conducted a study to assess glycemic control, mortality and long-term complications in children with type 1 diabetes (T1D). They retrospectively collected demographic data from computer records from 1991 to 2015. Prospective study for outcomes was conducted between 2012 and 2016. The proportion of T1D patients (n=512) <5 years of age at onset was 18.6% between 1995 and 2004, and 24.2% in 2005-2014 ($P < 0.001$). Twenty eight patients had died out of 334 whose living status was known (mortality 1.1 per 100 patient years over 2549 patient-years follow up). Median (range) HbA1c (n=257) was 8.3% (5.1-15.0%). At least one episode of severe hypoglycemia (coma/seizure/inability to assist self) had occurred in 22.8% patients over two years. Hypertension was present in 11.7% patients. Microvascular complications screen in 164 eligible patients [median (range) age 20 (8-45) y and duration of diabetes 9.1 (5-30) y] showed diabetic nephropathy in 3.0%, proliferative retinopathy in 3.6% and LDL cholesterol >100 mg/dL in 34% patients.

Conclusion

Authors found that 132 children had type 1 DM. Common complications were non-proliferative diabetic retinopathy, proliferative diabetic retinopathy, diabetic nephropathy and hypertension.

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