FLORA AND FAUNA

2015 Vol. 21 No. 2 PP 257-259 ISSN 0971 - 6920

INCIDENCE OF JUVENILE DIABETES AND ITS COMPLICATIONS AMONG CHILDREN IN LUCKNOW CITY, INDIA

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Received **:** 19.8.15; ***Accepted*** : 9.10.15

ABSTRACT

The purpose of this study was to find out the incidence of juvenile diabetes (type I diabetes mellitus) among children aged 0-25 years from north India, and to determine the complications and risk factors associated with juvenile diabetes. Complications were determined in patients based on physicians report. A total of 1000 juvenile diabetes patients (474 boys and 526 girls) were registered from the out patients department (OPD) of Medicine Department of King George Medical University, Lucknow. The overall prevalence of juvenile diabetes (per 100,000 persons) was 3.8. On cross sectional analysis 10.7% had poor glycemic control (A_{IC}>9%). The prevalence of complications was as follows: Hypertension-3.47%, Low HDL-18.0% and High C-reactive protein-46.6%. Poor glycemic control, hypertension and duration of disease were strong predictors of all complications. Though the prevalence of juvenile diabetes in India is low yet the burden is high due to large population and still lots need to be done to fill the gap between standard of care and practice.

Figure : 00 References : 13 Table : 01

KEY WORDS : Glycated haemoglobin (HbA_{1c}), High sensitive C, Juvenile diabetes (type I diabetes mellitus), Reactive protein (hs-CRP) .

Introduction

Juvenile diabetes/Type I diabetes mellitus (type I DM) is multifactorial in its aetiology. There is more than 350 fold variation in the incidence among the 100 populations worldwide [7]. The overall incidence of juvenile type I DM is 0.1/100000 per year in China but in India the data on incidence of type I DM are limited. The previous studies conducted in India show wide range of prevalence of juvenile diabetes in children [1, 8, 9]. Only one population based study alone reports 10.5/100000 per year incidence over four year period among children in south Indian urban population [10]. The increasing incidence of juvenile diabetes has been observed throughout the world. With 4% increase in incidence of Juvenile diabetes, the burden in India is also expected to be large thereby necessitating the need for proper monitoring [3]. Only few studies have reported about the complications particularly vascular complications that are associated with Juvenile diabetes [2, 6, 11, 13]. The present study was performed to find out the incidence of Juvenile diabetes and its associated complications among children in Lucknow city.

Materials and Method

In the present study 1000 young type I DM patients with onset age <25 years were selected based on notifications by Diabetologists/ Physicians from outpatient department of Medicine, Balrampur Hospital, Lucknow.

The present status and past health status alongwith family history for type I DM (Juvenile diabetes) of patients registered for the study were recorded. Besides this, data on associated complications were collected in groups of study population based on reports of screening tests. Screening tests were dependent upon follow up visits by the patients. The study population was subjected to following tests *viz* Blood sugar (BP) fasting and post prandial blood sugars, glycated haemoglobin (HbA_{1c}), serum creatinine, serum albumin and high sensitive C-reactive protein (hs-CRP).

Neuropathy was established as failure to elicit the knee/ankle reflexes, Retinopathy was

TABLE-1: Occurrence of late complications associated with type I DM among study population

Complications	Prevalence	Percent (%)
Neuropathy	(14)/230	6.08
Retinopathy	(16)/170	9.4
Nephropathy	(20)/230	8.6
Hypertension	(08)/230	3.47
High hsCRP	(21)/45	46.6
Low HDL	(19)/105	18.0

established when there were diabetic retinal changes, Neuropathy was defined as quantitative urine protein excretion of >500mg per 24 hrs in absence of other renal disease. Hypertension was defined when BP was >95 percentile of age and sex specific values, C-reactive protein value were compared with age and specific normal values. Body weight and height of sample population were taken and BMI was calculated in Kg/m^2. Blood glucose was measured using colorimetric test with glucometer. HbA_{1c} was measured using high performance liquid chromatography (HPLC) method. Blood samples were collected in fasting state and were analyzed for Total Cholesterol (TC), Total Glucose (TG), and High Density Lipoprotein (HDL) using specific enzymatic methods in autoanalyser. Serum creatnine was measured by photoelectric colorimetric test using creatinine liqucolour kit. Hs-CRP was measured by turbidometry using kit. Serum albumin in urine was measured using dipstick methods.

Primary statistical analysis focused on the incidence. The overall prevalence of cimplications was calculated using frequency distributions. All values were expressed as Mean± SD. A p-value of <0.05 represented statistical significance. All calculations were done using SPSS software (11.0) version.

Results and Discussion

Out of 1000 patients enrolled for the study during November 2013 to December 2014, 474 were boys and 526 were girls. The incidence of type I DM (Juvenile diabetes) during 1 year follow up period was 3.8 per 100000 persons covering the total population in age group 0-25 years. The incidence did not differ among genders; there was yearly increasing trend in incidence of type I DM. The age of onset of type I DM (Juvenile diabetes) ranged from 1 year to >20 years. One hundred fifty four (37%) out of 415 patients had developed type I DM (Juvenile diabetes) between 7 to 14 years. The mean HbA_{1c} was 8.9% indicating poor glycemic control. Table 1 shows the occurance of late complications associated with type I DM among study population.

The type I DM (Juvenile diabetes) incidence was 3.8/100000 per year in the current study was less compared to incidence of 105/100000 from south India [1, 7, 8, 9, 10]. The incidence rate increased with age and was highest among children 7-14 years age similar to those results as were observed in other incidence studies[1, 7, 8, 9, 10]. There was no significant difference between males and females.

The prevalence of complications observed/ reported in the present study was different from the result of previous studies in India[4]. This variation observed in the prevalence of complications may be due to difference in the sample size and differences that exists among studied population. The growth pattern observed in the study with most patients having short stature confirms the findings that linear growth is affected in children with diabetes [5].

To conclude it may be stated that though the incidence of type I DM (Juvenile diabetes) in young is low in the population compared to the western population. The burden of disease is high owing to the large population in India. Thus type I DM children young and adults need long term follow up with periodic checking of cardio-renal risk factor to prevent chronic complications in future.

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