

PREVALENCE OF DIABETIC RETINOPATHY AMONG CHILDREN WITH TYPE 1 DIABETES MELLITUS

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Abstract

Background: This study to find out the prevalence of diabetic retinopathy (DR) among diabetic children with type 1 DM treated with insulin.

Methods: This is a cross-sectional study conducted on 50 children with type 1 DM from 1 to 14 years of age. All patients were subjected to full fundus examination and were then classified according to its results into patients with DR and patients without DR.

Results: A total of 6 (12.0%) patients were found to have DR. 5 patients had retinopathy in one eye and 1 patients had retinopathy in both eyes. Thus, the total number of eyes with retinopathy was 7 of 100 screened eyes (7.00% of all eyes). Most eyes with retinopathy had a mild degree of NPDR, as it was present in 6 eyes. The other 1 eyes had moderate degree of retinopathy

Conclusion: The prevalence of DR was 12.0% among all studied patients and 7.00% among all studied eyes. The grade of retinopathy was directly related to the duration of DM, fasting blood glucose, and glycosylated hemoglobin levels.

Keywords: DM, DR, Hb1Ac

Introduction

Nowadays children are within the group of low risk of developing DR; however, the related literature refers to the cases of adolescents with diabetic macular oedema, or even proliferative DR (PDR).¹⁻⁴ The prevalence of DR in the pediatric population was shown in range between 2.3% and 57.6%.⁵ In the study of 4172 patients with diagnosed T1D from 12 years of age, the background DR was 26.7%, initial DR was 10.7%, and proliferative DR was 4.1%.⁵

There are many guidelines for the screening of pediatric DR. However, they are more or less similar in giving annual screening recommendation after 3–5 years of the initial diagnosis of the disease.⁶ This work was conducted to study the prevalence of DR among diabetic children having type 1 DM treated with insulin.

Material and methods

Type of study- Cross sectional descriptive analytical study.

Study population- 50 children with type 1 DM

Inclusion criteria:

- Age from 1 to 14 years old.
- Type 1 DM; treated by insulin, documented by increased blood glucose level, increased HbA1c, low C-peptide levels and weight within normal percentiles.

Exclusion criteria:

- Type 2 DM.
- Not willing to participate

All the cases were subjected to complete physical examination, anthropometric measures (weight, height, etc.), and biochemical examination [HbA1c, T4, thyroid-stimulating hormone (TSH), anti-tissue transglutaminase and urine for microalbuminuria].

Fundus examination was done by indirect ophthalmoscopy (under sedation if required) or slit lamp biomicroscopy using 90 D noncontact lens. It included examination of the optic disc, macula, retinal blood vessels, background, and fundus periphery to detect any signs of DR. The central macular thickness was measured by SD-OCT.

Data Analysis:

Data was recorded as per Performa. The data analysis was computer based; SPSS-22 was used for analysis. For categorical variables chi-square test was used. For continuous variables independent samples's *t*-test was used. *p*-value <0.05 was considered as significant.

Results

Table 1: Patients characteristics

Age in yrs	9.34±1.26
Male : Female	28: 22
BMI in kg/mt ²	22.10±3.02
Duration of DM in yrs	4.65 ±1.05 Yrs
Hb1Ac	8.16 ± 1.23
Patients with retinopathy	6/50 (12.00%)
Eyes with retinopathy	7/100(7.00%)
Affection (unilateral : Bilateral)	5 : 1
Degree of retinopathy (Mild : Moderate)	6 : 1

A total of 6 (12.0%) patients were found to have DR. 5 patients had retinopathy in one eye and 1 patients had retinopathy in both eyes. Thus, the total number of eyes with retinopathy was 7 of 100 screened eyes (7.00% of all eyes). Most eyes with retinopathy had a mild degree of NPDR, as it was present in 6 eyes. The other 1eyes had moderate degree of retinopathy.

Discussion

DR is a potentially blinding complication of diabetes especially in children and young adults, hence the importance of screening and routine fundus examination.⁷ In the past few years, routine fundus examination has been added to the health insurance system for adults in Egypt. However, routine screening in the young age is still facing difficulties, may be because of caregiverincomplianceor the incompliance of the child parents themselves. A total of 6 (12.0%) patients were found to have DR. 5 patients had retinopathy in one eye and 1 patients had retinopathy in both eyes. Thus, the total number of eyes with retinopathy was 7 of 100 screened eyes (7.00% of all eyes). Most eyes with retinopathy had a mild degree of NPDR, as it was present in 6 eyes. The other 1eyes had moderate degree of retinopathy.

A study published more recently in the year 2015 by Tapley *et al.*¹⁰ reported a lower prevalence rate than the current study. They studied 236 pediatric patients with either type 1 or type 2 DM and 5.5 years as a mean duration of DM. They detected DR in 3.8% of participants.

In addition, Kernell *et al.*¹¹, in 1997, detected retinopathy in 5% of patients between 8 and 10 years of age, which is less than our results. However, a higher prevalence of DR was found by Eppens *et al.*,¹² who found DR in 254 (20.0%) of 1264 patients with type 1 DM, with a mean age of 15.7 years.

Conclusion

The prevalence of DR was 12.0% among all studied patients and 7.00% among all studied eyes. The grade of retinopathy was directly related to the duration of DM,

fasting blood glucose, and glycosylated hemoglobin levels.

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