PREVALENCE OF DIABETIC RETINOPATHY IN NEWLY DIAGNOSED TYPE 2 DIABETES MELLITUS PATIENTS

Ismat Ereifej MD, Ahmad Jaffar MD*, Bassam Nawaiesh MD*, Farid Al-Zawaideh MD**

ABSTRACT

Objective: To determine the prevalence of diabetic retinopathy in patients with newly diagnosed type 2 diabetes mellitus.

Methods: This study was conducted at Royal Medical Services hospitals between March 2001 and March 2004. A total of 583 patients with newly diagnosed type 2 diabetes mellitus were referred to ophthalmology clinics by their treating physicians for ophthalmologic assessment.

Results: The prevalence of diabetic retinopathy was 22.6%. The commonest presenting diabetic retinopathy was mild non-proliferative diabetic retinopathy (31.5%), and the least common was severe non-proliferative diabetic retinopathy (17.3%).

Conclusion: Diabetic retinopathy is a common finding in patients with newly diagnosed type 2 diabetes mellitus. Being a preventable and treatable complication if diagnosed and treated at earlier stages, a national strategy should be implemented to achieve this goal.

Key words: Diabetic Retinopathy (DR), prevalence, Type 2 Diabetes Mellitus (Type 2 DM).

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Introduction

Throughout the world, the prevalence of type 2 diabetes mellitus (type 2 DM) has increased in the past two decades;[1] both in developed and developing countries.[2] Decreased physical activity, and changes in food consumption have been implicated in this epidemic.[3,4] Type 2 DM is characterized by an asymptomatic phase between the actual onset of diabetic hyperglycemia and clinical diagnosis, resulting in high prevalence of complications in newly diagnosed type 2 DM patients.[5-7]

Diabetic retinopathy (DR) is a highly specific microvascular complication of DM,[8,9] and remains the leading cause of blindness and visual impairment in adults.[10,11] The prevalence and progression of DR is associated with elevated blood pressure, elevated cholesterol and triglyceride serum levels, and obesity.[12,13]

Several studies have emphasized that early detection and intensive diabetes management may prevent or delay the progression of DR in type 2 DM patients, giving rise to recommendations to screen for type 2 DM, that might make it possible to identify diabetic patients much earlier while in the asymptomatic phase of the disease.[14-16]

This study was conducted to assess the prevalence and the spectrum of DR findings in newly diagnosed type 2 DM patients.

Methods

This study was conducted during the period of

*From the Department of Ophthalmology, King Hussein Medical Center, (KHMC), Amman-Jordan
Correspondence should be addressed to Dr. I. Ereifej, (KHMC), E-mail: ismatereifej@yahoo.com
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March 2001 to March 2004 in the ophthalmology clinics at King Hussein Medical Center, Queen Alia, Princess Haya Bint Al-Hussein and Prince Hashim Bin Al-Hussein Hospitals.

During the study period, a total of 583 patients with newly diagnosed Type 2 DM were referred to ophthalmology clinics by their treating physicians for fundus examination. Twenty-one patients with anterior segment opacities precluding proper fundus evaluation were excluded from this study. The remaining 562 patients received full ophthalmologic assessment consisting of recording best corrected visual acuity using an illiterate Snellen's chart, slit lamp biomicroscopy to assess anterior segment, tonometry using Goldmann's applanation tonometer, fundus stereoscopic examination through dilated pupils using a 78D and 90D non-contact lenses at the slit lamp, indirect ophthalmoscopy through dilated pupils using 20D lens. Finally, fundus fluorescein angiography and fundus photography were requested for patients found to have diabetic retinopathy necessitating prompt treatment.

Grading of the diabetic retinopathy was based on the International Clinical Diabetic Retinopathy and Macular Edema Diseases Severity Scale criteria, proposed by the American Academy of Ophthalmology.[17] If the two eyes of a patient had different grades of diabetic retinopathy, the worse grade was considered for this study.

Risk factors such as age, sex, weight, lipid abnormalities, family history of DM, history of gestational diabetes (in females), socio-economic status, and associated cardio-vascular diseases were not evaluated, as the purpose of this study was only to determine the incidence of diabetic retinopathy among this study population irrespective of these variables.

Results

The study population was 562 patients, consisting of 314 (55.9%) males and 248 (44.1%) females. A total of 127 patients (22.6%) exhibited a spectrum of diabetic retinopathy findings, with the most common being mild non-proliferative diabetic retinopathy (31.5%), followed by moderate non-proliferative diabetic retinopathy (28.3%), macular edema in all types of diabetic retinopathy (31%), proliferative diabetic retinopathy (22.8%), and severe non-proliferative diabetic retinopathy (17.3%) (Table I).

Table I. Diabetic Retinopathy grades found in newly diagnosed type 2 DM patients.

Diabetic retinopathy grade*		No. of patients (%)	Total No. of patient (%)
Mild NPDR	+ ME	3(2.4)	40(31.5)
	- ME	37(29.1)	
Moderate NPDR	+ME	8(6.2)	36(28.35)
	- ME	28(22)	
Severe NPDR	+ME	10(7.9)	22(17.32)
	- ME	12(9.4)	
PDR	+ ME	15(11.8)	29(22.83)
	- ME	14(11)	

*NPDR: Non-proliferative Diabetic Retinopathy,
PDR: Proliferative DiabeticRretinopathy, ME: Macular Edema

Discussion

Undiagnosed type 2 DM is not a benign condition. Clinically significant morbidity is present at diagnosis and for years before diagnosis.[5] Type 2 DM is characterized by an asymptomatic phase between the actual onset of diabetic hyperglycemia and clinical diagnosis. This phase has been estimated to last at least 4-7 years, and consequently 30-50% of type 2 diabetic patients remain undiagnosed. Untreated hyperglycemia is an explanation for the relatively high prevalence of retinopathy in newly diagnosed diabetic patients.[7]

Internationally, the incidence of diabetic retinopathy in newly diagnosed type 2 DM patients has varied widely - (2.6%),[18] (7.3%),[19] (l4.4%),[20] (21%),[21] (25.5%),[22] (39% in men, 35% in women),[23] and (55%)[24] - depending on the methodology and population sample. In Jordan, the prevalence of diabetic retinopathy among diabetic patients was reported at (64.1%).[25]

The prevalence of DR in our study group was within the limits of the international rates, but still it was lower than anticipated. This might be due to the fact that the presence and grading of the DR was according to the findings obtained by mydriatic indirect ophthalmoscopy and mydriatic indirect slit lamp biomicroscopy, which are less sensitive than fundus fluorescein angiography and fundus photography at detecting DR at earlier stages.[26,27]

In our study, the presence of sight threatening diabetic retinopathy (severe non-proliferative diabetic retinopathy, proliferative diabetic retinopathy or macular oedema) was detected in 62 patients out of 127 (48.8 %), which is significantly higher than that obtained in other reports.[28]

The lack of screening programs to detect type 2 DM patients, resulting in late diagnosis and treatment initiation with progression of complications, might be the cause behind this phenomenon. This is supported by studies stating that approximately one third of

asymptomatic patients with type 2 DM are undiagnosed,[29,30] and some are miss-classified as type 1 DM as in many young patients with severe hyperglycaemia.[31]

The incidence and progression of DR can be reduced by optimal metabolic control. Laser photocoagulation therapy is effective in reducing DR progression and early vitrectomy can prevent, in many cases, severe vision loss in patients with advanced stages of DR. This goal should not be only the responsibility of the ophthalmologist, but all those who are in contact with the diabetic patients, namely, general physicians, endocrinologists and trained para-medical personnel. To accomplish this, an appropriate, cost-effective, national strategy should be implemented with the following goals:

1. Screening and early detection of type 2 DM.
2. Intensive glycemic control of type 2 DM.
3. Screening and early detection of DR in newly diagnosed type 2 DM patients, and initiation of treatment with photocoagulation for sight threatening DR.
4. Modification of the lifestyle of DM patients, to achieve and maintain weight reduction through means of healthier food consumption habits and physical activity programs.

Failure of early detection of diabetic retinopathy will increase the burden for the health care system due to the high cost of treatment and disability payments.

Limitations of the study

1. Use of fundus photography and fluorescein angiography, which have a higher sensitivity rate, was restricted due to the high cost of these procedures.
2. Variables known to be risk factors for DM and influencing the presence and progression of its complications (age, sex, lipid profile, weight, and cardio-vascular diseases) were not considered in this study.

Conclusion

DR is a common finding in patients with newly diagnosed type 2 DM. This being a preventable and treatable complication, if diagnosed and treated at earlier stages, a national strategy should be implemented to achieve this goal.

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