Retinal Manifestations of Diabetes on the First Visit of Jordanian Diabetics to the Ophthalmology Clinic

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ABSTRACT

Objectives: To assess retinal complications of diabetes mellitus among Jordanian diabetic patients during their first visit to the ophthalmology clinic.

Methods: This study was conducted at Ophthalmology outpatient clinics in three major Royal Medical Services hospitals between 1st June 2009 and 1st October 2010. Sixty-seven diabetic patients who attended these clinics for the first time for complete ophthalmological examination were enrolled in the study regardless of the type and duration of diabetes. Pregnant women, patients with systemic lupus erythematosus, sickle cell disease or previous retinal and chronic ocular diseases were excluded from the study. A detailed history was obtained from every patient. Ocular examination included best corrected visual acuity, ocular adnexal and ocular motility, and slit-lamp examination of the anterior and posterior segments.

Results: The mean age of patients and duration of diabetes was 53.6 and 6.2 years respectively. Diabetic retinopathy was present in 29 (43.2%) patients; seven of them had Type I diabetes mellitus and 22 (32.8%) patients had Type II diabetes. The frequency of non-proliferative diabetic retinopathy, proliferative diabetic retinopathy, and maculopathy was 20.8%, 6.0% and 16.4% respectively; none of the patients had anterior segment or adnexal diabetic complication at the time of presentation.

Conclusion: Diabetic retinopathy has a high frequency among a clinic sample of Jordanian patients with diabetes. Retinopathy screening remains inadequate. Effort is needed to improve health education and diabetes awareness in the general population. This will allow early detection and treatment of diabetic retinopathy and reduce the burden of visual impairment in the Jordanian population.

Key words: Diabetes mellitus, Complications, Retinopathy, Awareness

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Introduction

Diabetes mellitus (DM) is a common disorder across global populations and produces disease in multiple organs. The ocular complications of diabetes mellitus are numerous and include retinopathy, cataract, uveitis, glaucoma, and neurophthalmic disorders. Jordan is considered one of the countries with high frequency of diabetes mellitus and impaired fasting glycemia. It is estimated that the frequency of diabetes mellitus in developed countries to be 5%.[(1)] In 2008, a study conducted by Ajlouni *et al*,[(2)] found that the frequency of diabetes mellitus and impaired fasting glycemia in Jordan to be 17.1% and 7.8% respectively, which showed a significant increase in the frequency of Diabetes mellitus in comparison

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to a survey performed in 1998,which was 13.4%.[3] Diabetic retinopathy (DR) is the leading cause of new cases of blindness in persons aged between 20 and 74 years in western world.[4] In 1999 the frequency of diabetic retinopathy in Jordan was 62.5% in Type I DM and 50% in type II DM.[5] A more recent study in 2005 reported that the overall frequency of diabetic retinopathy among Jordanian diabetics to be 64.1% and the frequency of blindness among Jordanian diabetics was found to be 7.4%, while 10.1% were visually impaired.[6] In another study conducted by Al Salem et al,[7] diabetic retinopathy was the leading cause of blindness (13%) after retinitis pigmentosa (17.6%) and glaucoma (16%). Duration of diabetes mellitus and poor glycemic control are key factors behind the development of diabetic retinopathy.[8, 9]

The aim of this study was assessment of diabetic retinopathy in Jordanian diabetic patients who attended ophthalmology clinics for the first time at three major Royal Medical Services hospitals.

Methods

This study was conducted in the Ophthalmology outpatient clinics in three major Royal Medical Services hospitals (Prince Rashid Bin Al Hassan Hospital, Princess Haya Bint Al Hussein Hospital and Al Hussein Hospital) between 1st June 2009 and 1st October 2010. Diabetic patients visit eye clinic either with a referral letter from their physician or come directly without a referral letter to get an appointment for complete ophthalmic assessment after being diagnosed to have diabetes mellitus of either type. Regardless of the duration of diabetes, newly diagnosed patients are usually referred by their internist or endocrinologist for ophthalmic assessment. Referred patients have variable risk factors profiles with reference to glycaemia, hypertension, smoking status, medication and duration of diabetes. Pregnant women, young children, patients with systemic lupus erythematosus, sickle cell disease or previous retinal and chronic ocular diseases were excluded from the study. Sixty-seven diabetic patients attending these clinics for the first ophthalmological examination after being diagnosed with diabetes were enrolled in the study. A detailed history was obtained from every patient, including age, gender, smoking, current medications, type of diabetes mellitus, duration of diabetes mellitus, and the reason of attendance to the ophthalmology clinic. All patients were asked about their awareness of diabetic complications on the eyes. The reason for delayed presentation to the retinopathy screening service was asked for those patients whose diabetes was diagnosed for more than five years. Ocular examination included best corrected visual acuity, ocular adnexa and motility, slit-lamp examination of the anterior and posterior segments (using 78D non-contact lens), intra ocular pressure measurement using Goldmann applanation tonometry and fundus Flurescein angiography when indicated.

Results

The age of the patients ranged between 26 and 87 years (average 53.6 years). Thirty-five of them (52.2%) were males. Fourteen patients (20.9%) had Type I DM and the remaining 53 patients (79.1%) had Type II DM. The duration of DM ranged between zero and 25 years (average 6.2 years). Diabetic retinopathy was present in 29 patients (43.2%) seven (24.1%) of whom had Type I DM, and 22 (75.9%) patients had Type II DM. Table I summarizes the reasons for attendance to the ophthalmology clinic and Table II summarizes the results of ophthalmological examination among the patients.

Table I: Reasons for attendance to ophthalmology clinic

Reason of attendance	Number of patients	%
Dropping of vision	37	55.2
Check up	14	20.9
Referred from another clinic	9	13.4

Table II: Results of ophthalmological examination among the patients

Finding	Number of patients	%
No Diabetic retinopathy	38	56.8
Mild NPDR*	5	7.4
Moderate NPDR*	3	4.4
Severe NPDR*	6	9.0
PDR*	4	6.0
Maculopathy alone	11	16.4

* Can be with or without maculopathy

Discussion

The aim was to screen diabetic patients for diabetic retinopathy at their first visit to the ophthalmology clinic. This study was planned to explore awareness of diabetic eye disease and the

effectiveness of preventive measures adopted in Jordan. About 43% of patients had a decrease in their best corrected vision and three patients (4.5%) were legally blind (corrected vision is less than 6/60 according to WHO classification of blindness).

In a Jordanian study by Al Till *et al.*[6] the frequency of blindness among diabetic patients was 7.4% compared to 4.5% in our study. It should also be noted that the average duration of diabetes mellitus in our study was 6.2 years compared to 11.9 years in their study. Al-Bdour *et al.*[10] examined the causes of blindness in adults from age 20 years onwards and found that diabetes mellitus was a major contributor. However, diabetes-related blindness has decreased since the advent of effective screening programmes which are connected to laser treatment and vitreoretinal surgery facilities.[11-13] The international clinical diabetic retinopathy severity scale adopted by the American Academy of Ophthalmology (AAO)[14] and the International Council of Ophthalmology (ICO)[15] were used to classify patients into non-proliferative diabetic retinopathy (NPDR) (mild, moderate and severe) and proliferative diabetic retinopathy (PDR). Mild NPDR is used when only micro-aneurysms are present, moderate NPDR when more than just microaneurysms are present, severe NPDR when any of the following are present: intra-retinal hemorrhage in each of the four quadrants, venous beading in two or more quadrants, or intraretinal microvascular abnormalities (IRMAs) in one or more quadrants and no signs of PDR. PDR was defined as neovascularization at the optic disc, iris or elsewhere. In our study the frequency of diabetic retinopathy was 43.2%, and was found to be higher in Type I DM when compared to Type II DM. In terms of severity, the frequency of NPDR, PDR, and maculopathy was 20.8%, 6% and 16.4% respectively. The frequency of diabetic retinopathy and its grades were lower in our cohort when compared with other studies. For example, Al Salem and Ajlouni[5] in 1999 reported the following frequency in their cohort with Type II DM: diabetic retinopathy (50%), NPDR (38.85%), PDR (11.2%) and maculopathy (17%). Another study by Al Till *et al.*[6] in 2005 revealed the following numbers: 64.1%, 54.8%, 9.3% and 30.8% respectively. These differences may be attributed to differences in duration of DM (7.5 and 12 years in the two studies compared to 6.2 years in our study), and the method of study, in that the patients with DM diagnosed less than three years prior were excluded in these studies unlike our study in which they were included. In addition to that, our study concerned about screening the diabetic patients on their first visit only, unlike the previous two studies which were concerned about the frequency of DR regardless if it was the first visit or not. In our limited sample we observed a frequency of DR broadly similar to that reported by larger studies. For instance, our frequency of 43% compared with 34% published by Amer *et al*,[9] who communicated clinic findings from patients regardless of whether the visit was a first or subsequent attendance.

Eleven patients had newly discovered diabetes, from those; retinopathy was present in four patients (36.4%) and two of them had PDR. Thirty-five patients had duration of diabetes for less than five years and eight of them had diabetic retinopathy. This clearly reflects that the patients were poorly screened for the presence of diabetes. As shown in Table III, 22 patients had duration of DM between five and 10 years and 12 of them had DR, four patients had duration of DM between 10 and 15 years and three of them had diabetic retinopathy, all of the remaining six patients who had duration of DM between 15 and 25 years had diabetic retinopathy. This finding is consistent with the well-reported observation that the risk of diabetic retinopathy increases with duration of diabetes. Patients who were unaware of diabetic eye disease were typically those with poor diabetic control.

Table III: Frequency of DR among diabetic patients with regard to duration of DM

Duration of DM	Number of patients with DR / total number of Diabetics	%
(0-5) years	8 / 35	22.9
(5-10)years	12 / 22	54.5
(10-15)years	3 / 4	75.0
(15-20)years	4 / 4	100
(20-25)years	2 / 2	100
Total (0-25)years	29 / 67	43.2

Improvement in patient education and retinopathy screening will be pivotal in reducing the burden of diabetic eye disease in Jordan.[16] When patients were questioned regarding DM awareness and ocular complication it was found that 91% knew that DM can cause eye disease. Their source of information came from medical and paramedical staff (71.2%), close associates (13.7% friends, neighbors, colleagues), and through the media

(7.1% TV, newspapers, radio, magazines). However, 61.2% of patients did not know that diabetic retinopathy can occur without visual symptoms. This observation explains why patients may attend only when there is a drop in visual acuity and also the low figure of patients (13.4%) attending for DR screening. When patients with DM for at least five years were asked why they were not attending for diabetic retinopathy screening, 51.9% reported that the presence of good vision meant they could not appreciate the reason for attendance. Cultural issues (such as a worry that laser may harm the eye) meant that 40.7% were unwilling to attend. The remaining 7.4% had no cause. This study showed that there is a significant frequency of diabetic eye disease in Jordan. Among the population there is also a suboptimal appreciation of this condition and its complications. Our findings support those of earlier work in the same area: there is a clear need for a national healthcare plan to screen for diabetes and diabetic eye disease. Any such screening framework should be supplemented by strategies to improve education and awareness.

Conclusion

Although the study sample was small, our report demonstrated the need for early detection and treatment of diabetes and diabetic retinopathy. We also support the point of view that the Jordanian media should actively encourage attendance for both diabetes and diabetic retinopathy screening. This information will facilitate a systemic screening and treatment programme for diabetic retinopathy in Jordan.

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