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Frequency of Ophthalmic Complications on 140 Cases of Type II Diabetes Mellitus, Babol-Iran

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Abstract: *Objective* Diabetes mellitus (DM) has several ophthalmic complications with rethinopathy being the most visually disruptive outcome of uncontrolled disease. The aim of this study was to determine frequency of ophthalmic complications in diabetes mellitus. *Methods* This descriptive study was performed on 140 type II diabetic patients in Shahid Beheshti Hospital during 2007-2008. All patients were assessed by questionnaire for age, gender, duration of disease, fasting blood sugar (FBS), hemoglobin A1c (HbA1c), blood pressure (BP), method of diabetic control and examined by observation, slit lamp and tonometer for detection of cataract, glaucoma, ophthalmic neuropathy. Retina observed by indirect ophthalmoscop and lens +90 for detection of retinopathy and maculapathy. Data were recorded and analyzed. *Results* fourty five (32.1%) males, 95(67.9) females with the mean age 53.49 ± 9.72 years. Were evaluated. Mean duration of disease was 8.88±6.06 year and 71.1% of them had HbA1c over 7%, 6 (4.3%) had ophthalmic neuropathy, 1 case ptosis and 1 case with rubeosis were noticed. Retinopathy was seen in 51 (36.42%) patients which most of them were non proliferative diabetic retinopathy (NPDR) (29.2%). Maculopathy was seen in 35 (25%), patients with clinical significant macular edema (CSME) to be the most (23.6%). There was a significant difference in FBS levels between diabetic retinopathy and no diabetic retinopathy groups (p=0.042). The difference was also significant when HbA1c levels were compared between the two groups (p=0.003). *Conclusions* The results show that retinopathy was the most common complication of DM and that higher FBS levels and HbA1c > 7% are associated with development of ocular retinopathy.

Key words: Diabetes mellitus · Ocular complications · Diabetic retinopathy

INTRODUCTION

Type 2 diabetes is one of the known metabolic diseases that affects human economical and socially [1]. Retinopathy, secondary glaucoma, cataract, ophthalmic neuropathy are the few complications of it that may lead to blindness [2]. As a matter of fact, many people aging 25 to 74 years old suffer from diabetic retinopathy which is the leading cause of blindness in the advanced countries and is the fourth leading cause of blindness in all ages in developing world [3].

The prevalence of retinopathy is influenced by increasing of HbA1c [4]. While there is a significant decrease in the advancement of DR and also in the incident of proliferative diabetic retinopathy (PDR) due to a decrease in HbA1c [5]. Intensive diabetic controle helps to decrease in the development and progression of all diabetic difficulties [6]. Thus monitoring of diabetes can reduce retinopathy and other ophthalmic complications.

We decided to assign the prevalence of ophthalmic complications of diabetic patients, they were referred to Shahid Beheshti Hospital, because we believe that the early diagnosis and suitable treatment of diabetes can reduce ophthalmic complications and protect eyes from blindness.

MATERIALS AND METHODS

This descriptive - cross sectional study was done on 140 type 2 Diabetic Patients based on WHO scales who were admitted in Babol Shahid Beheshti Hospital's eye Clinic. All cases were referred by endocrinologist to our department from 2007 to 2008.

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Questionnaire was given to any patients. It was consisted of first description of patients such as age, gender, education, diabetic duration, FBS (it was divided in two groups: =130, >130), HbA1c two groups: good control (=7%), poor control (>7%), family history, hypertension (HTN), body mass index (BMI), method of treatment. After noted of these variables at the questionnaire, all patients were examined through observation and biomicroscop for detection of visual aquity, eye movements, eyelid position, cataract, rubeosis iridis and intraocular pressure (IOP).

After dilating the pupil by phenylepherin 5% and tropicamyde 1%, ophtalmoscopy were performed by indirect ophthalmoscop and + 90 lens, for detecting of retinopathy, maculapathy and vitreous hemorrhage. Then, data were collected and coded. Statistical analysis were done using SPSS version 15. The student t test was used to compare continues variables and X2 test and fisher exact test were used for categorical variables. and $P < 0.05$ was considered significant.

Findings: The mean age of patients was 53.49±9.72 years (ranged 29-78). Forty-five (32. 1%) patient were male and ninety five (67.9%) patients were female. One hundred ten patients (78.6%) had less than Diploma, 24 (17.1%) patients had Diploma and 6 (4.3%) patients had Bachelor of Science (B.S) and upper. The average of BMI was 28.34±3.83. Mean duration of diabetes was 8.88±6.06 years. One hundred eleven patients (79.3%) use oral drugs, 20 (14.3%) patients insulin, 9 (6.4%) patients diet for controlling of diabetes. From FBS point of view, 42 (30%) pationt were lower than 130 and 98 (70%) with upper of 130 mg/dl. From HbA1c point of view, 35 (28.9%) patients were lower of 7% (good control group) and 86 (71.1%) patients upper of 7 % (poor control group). HTN> 130 / 85was in 31 (22.1%) patients, 91 (65%) patients had family history of diabetes. Glaucoma was not seen.

The eye movements in all patients were normal. One patient had ptosis and another patient had rubeosis iridis. Five patients (3.6%) diabetic foot, 6 (4.3%) patients neuropathy, 1 (0.7%) patient chronic heart failure and 1 (0.7%) patient had renal disease.

There was cataract in 25 (17.85%) patients; maculopathy was in 35 (25%) patients that the most range of it (23.6%) was related to CSME. Retinopathy was in 51 (36.42%) patients, that the most of them was non-proliferative [NPDR 43 (84.31%) and PDR 8 (15.68%)].

In the group of FBS = 130, 10 (23.8%) patients and in the group of FBS>130, 41 (41.8%) patients had retinopathy, the difference between them was significant (p=0.042).

Talale 1: characteristics of the diabetic patients according to retinopathy status

	Retinopathy n = 51	No Retinopathy n = 89	P value
Mean age (SD)	53 /7 (8/6)	52/76 (9/8)	0.62
Gender:			
Male	15 (33.3%)	30(66.7%)	
Female	36 (37.9%)	59(62.1%)	0.6
BMI	29.75(4.73)	27.65(3.25)	0.014
FBS:			
= 130	10 (23.8%)	32(76.2%)	
>130	41 (41.8%	57(58.2%)	0.04
HbA1c [1]:			
≤7%	5 (14.3%)	30 (85.7%)	
> 7%	37(43%)	49(57%)	0.003
Duration	9/65(5/3)	8/46 (6/5)	0.34
H. T. N:			
With:	10 (32. 3%)	21 (67/7%)	
Without:	41 (37. 6%)	68 (62.4%)	0.58
Education:			
Lower diploma	44(40%)	66 (60%)	
Diploma	7 (29.2%)	17 (70.8%)	
B.S.and upper	0.(0%)	6 (100 %)	0.1

It has been calculated from 121 patient. 1.

Table 2: characteristics of the diabetic patients, according to maculopathy status

	Maculopathy n = 35	No maculopathy n=105	P value
Mean age (SD)	54.89 (9.9)	53.03(9. 65)	0.3
Gender:			
Male	10 (22.2%)	35 (77.8%)	
Female	25 (26.3%)	70 (73.7%)	0.6
BMI	29.04(4.72)	28.17 (3.57)	0.32
FBS:			
≤130	8 (19%)	34 (81 %)	
> 130	27 (27.6 %)	71 (72.4 %)	0.28
HBA1c [1]:			
≤ 7 %	5 (14.3 %)	30 (58.7 %)	
> 7 %	22(25.6 %)	64 (74.4 %)	0.18
Duration	10.21) 5.25)	8.45 (6.26)	0.14
HTN:			
with:	7 (22.6%)	24 (77.4%)	
Without:	28 (25.7 %)	81(74.3%)	0.7
Education:			
lower diploma:	31(28.2%)	79 (71.8%)	
Diploma:	4 (16.7%)	20 (83.8%)	
B.S. and upper:	0(0%)	6 (100%)	0.17

It has been calculated from 121 patients. 1.

In the good control group (HbA1c =7%), 5 (14.3%) patients and in the poor control group (HbA1c > 7%) 37 (43%) patients had retinopathy that the difference between them was significant (p=0.003). The characteristics of the diabetic patients according to retinopathy and maculopathy were shown in table 1 and 2.

DISCUSSION

In this study we found that 36.42% of type II diabetic patients developed retinopathy and may causes blindness in these patients, similar studies also showed retinopathy rates 15/.7% to 21/.9% [7.8.4.]. The higher rate of retinopathy in our study may be due to delay in diagnosis and initiation of appropriate treatment in these cases, like the reports others [9].

In this study we found more retinopathy cases in those with FBS > 130 (41.8%) versus FBS= 130 mg/dl which was 23.8%.

In this study, we found that 71.1% of our patients had HbA1c > 7% which means no controlling of their disease. Two studies in brazil and Hong Kong also showed mean HbA1c levels, 7.2±2.05 and 7.3±2.46 respectively [10, 11].

Although poor control cases had more retinopathy (43%) of our group of cases but epidemiological survey had shown that decreasing HbA1c were associated with lower diabetic complications [12].

In this study, 35 (25%) patients had maculopathy, that CSME was the most (23.6%), but it had no significant difference with FBS, HbA1c level. The low number of our cases may be related to the sample size which was relatively low and studies with more cases are necessary. Another research showed the prevalence rate 10% of maculopathy [13].

The mean duration of diabetes in our cases was 8.88±6.06 years, it was similar to the results of Boucher *et al*. and alwakeal *et al.* [8, 14]. In this study there is no significant difference between duration and ocular complications, it is seemed that if the numbers of patients increased, the difference would be significant.

In this study, 25 (17.85%) patients had cataract, but in Alwakeel JS's study was 22.9%. and Bob Mash study was 35.2% [14,15].

In summary we concluded that the higher FBS levels and HbA1c > 7% are associated with ocular retinopathy.

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