International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 04, 2020
ISSN: 1475-7192

PREVALENCE OF DIABETIC RETINOPATHY IN NEWLY DIAGNOSED PEOPLE WITH TYPE 2 DIABETES IN UZBEKISTAN

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Abstract---Background. *Diabetes mellitus takes the third place as a cause of death, following cardiovascular and oncological diseases.* ***The purpose*** *of the study is to evaluate the prevalence of DR among newly diagnosed patients with type 2 diabetes by means of screening in 6 pilot regions of Uzbekistan.* ***Materials and Methods:*** *We screened 944 patients with newly diagnosed type 2 diabetes for DR. 62% was female, 38% were male, and the average age was 59.39±10.22 years. Screening included medical history taking, measurement of blood pressure, BMI, fasting glycaemia, HbA1c, ECG and examination by the multidisciplinary team of doctors (endocrinologist, ophthalmologist, and cardiologist).* ***Results:*** *the prevalence of DR among patients with newly diagnosed diabetes was 11.5% (n = 108), of which 8.7% had non-proliferative (n = 82), 2.5% - preproliferative (n = 23), and 0.3% - proliferative (n = 3) stage. DR was diagnosed mainly in patients with long-time decompensation state (HbAlc> 9%), which indicates the duration of the disease as the main factor in the progression of DR.* ***Conclusion:*** *The effective control of various risk factors (blood pressure, glycaemia and lipid metabolism) in prevention of vascular complications of diabetes can significantly slow down the development of microvascular lesions of the retina.*

Keywords---*Diabetic retinopathy, Diabetes mellitus,HbA1c, arterial hypertension.*

I. INTRODUCTION

Diabetes mellitus takes the third place as a cause of death, following cardiovascular and oncological diseases. Annually, more than 5 million people die due to diabetes complications. According to the International Diabetes Federation (IDF) data, there are 415 million people living with diabetes in 2015, the number of patients with diabetes in the world doubles every 10-15 years, significantly worsening the level of population's health [3; 4]. Over 93 million people with diabetes have eye damage, and diabetic retinopathy (DR) develops in every third patient with diabetes [9].

Because of the long asymptomatic course of type 2 diabetes, there is a 5-10 years gap from the onset of the disease to its manifestation, and by the time of the first visit to the physician, about 50% of patients already have severe complications on cardiovascular system, kidneys, eyes, and feet due to the late diagnosis.

According to the literature data [3; 6], 16-37% of patients had various stages of DR by the time of diagnosis of type 2 diabetes. But diabetes itself can lead to exacerbation of other eye diseases, such as cataracts, glaucoma, loss of focusing ability, and double vision [7; 9]. According to epidemiological studies on DR (Wisconsin Epidemiologic Study of Diabetic Retinopathy - WESDR), 3.6% of patients diagnosed with type 1 diabetes at a young age and 1.6% of patients with newly

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DOI: 10.37200/IJPR/V24I4/PR201335
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

diagnosed type 2 diabetes in adulthood were blind. In European countries, where a program for the dynamic monitoring of patients with diabetes exists for a long time, less than half of patients miss their scheduled ophthalmologist examination. Therefore, issues of early diagnosis of diabetes and its complications determine the need for active identification of people with type 2 diabetes and people at risk [6; 7].

In Uzbekistan, as in many countries of the world, there is a tendency to increase of prevalence of diabetes and its complications. In 2000, there were 77,031 patients with diabetes in Uzbekistan, and in 2018, according to the data of the Republican Specialized Scientific and Practical Medical Center of Endocrinology under the Ministry of Health of the Republic of Uzbekistan, 230,000 patients with diabetes were registered, 80% of themwere patients with type 2 diabetes. The prevalence of diabetes is 6-7% (WHO, 2016), which indicates a late diagnosis of diabetes in the population [1; 2].

Today, there is no accurate statistic data on the prevalence of DR in Uzbekistan, including among patients with newly diagnosed diabetes.

The only way to reduce blindness in patients with diabetes is to conduct a large-scale screening for early detection of DR among people with diabetes and timely correct the detected eye disorders.

Objective

to study the prevalence of DR among newly diagnosed patients with type 2 diabetes by means of screening in 6 pilot regions of Uzbekistan.

Materials and methods

We screened 944 patients with newly diagnosed type 2 diabetes for DR. 62% wasfemale, 38% were male, and the average age was 59.39±10.22 years. Screening included: medical history taking, measurement of blood pressure, BMI, fasting glycaemia, HbA1c, ECG and examination by the multidisciplinary team of doctors (endocrinologist, ophthalmologist, and cardiologist). Ophthalmological tests were carried out in the ophthalmologist's office at the central regional multidisciplinary clinic (CRMC). All patients underwent measurement of visual acuity, correction with spectacle lenses, direct fundus ophthalmoscopy, biomicroscopy of optical media on a slit lamp and auto refractometry without correction. For the first time in Uzbekistan, a modern method – photographing of the fundus using the non-manual portable fundus camera VISUCSOUT 100 manufactured by Carl Zeiss Meditec AG Finland was used for early diagnosis of DR in patients with diabetes at the CRMC.

Statistical data processing was performed using the program Statistica 10, Excel (2007).

II. Results and discussion

To the screening data, the prevalence of DR among patients with newly diagnosed diabetes was 11.5% (n = 108), of which 8.7% had non-proliferative (n = 82), 2.5% - preproliferative (n = 23), and 0.3% - proliferative (n = 3) stage. DR was diagnosed mainly in patients with long-time decompensation state (HbAlc> 9%), which indicates the duration of the diseaseas the main factor in the progression of DR [1; 2; 5]. Our data do not confirm the data of the National Registry on prevalence of DR in the same category of patients (47%), which indicates the incorrect diagnosis of DR by regional doctors. Our screening for retinal disorders in patients with diabetes using a portable funduscamera was highly informative in diagnosis of the early stages of DR. Photorecording with data archiving will allow us to further compare changes in the retina in dynamics on the background of treatment. Many studiesproved that direct ophthalmoscopy, even if it is

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performed by experienced specialists, is not sufficiently informativeto use it as a reliable method for DR screening. Whilefundus photography using a fundus camera is a reference method at the early diagnosis of DR with data archiving in dynamics [8; 10; 11; 12].

Examining the eyes of patients with newly diagnosed type 2 diabetes, besides DR, we revealed the following eye diseases: diabetic cataract (DC) in 27.3%, which significantly exceeds the data received from regional eye hospitals, were the prevalence of DC among patients with type 2 diabetes in Uzbekistan,is 13.2%. In 24.8% of the examined patients with newly diagnosed type 2 diabetes, we revealed anomalies of refraction. Pterygium was diagnosed in 4.7% of patients, the reason for such a high prevalence among patients with diabetes is metabolic disorder and high insolation due to climatic conditions typical for our country.

According to the results of the screening, 45.4% of examined patients had a hereditary predisposition to arterial hypertension (AH). The target level of blood pressure (BP) in patients with diabetes in the conducted screening studies was less than 140/90 mm Hg. However, 69% (n = 651) of patients had AH (systolic BP159.86+19.79 mm Hg, diastolic BP 95.88±9.78 mm Hg). This significant deterioration is a result ofsignificant increase in proportion of patients who do not take antihypertensive therapy.

Among newly diagnosed patients with type 2 diabetes, 43.3% were obese (BMI was 31.53±4.05 kg/m^2), while LDL level was significantly high (4.4±0.22 mmol/L, p> 0.05) on the background of relatively low HDL level (0.94±0.03 mmol/L). It is well known that overweight and obese people have a high risk of diabetes, dyslipidemia, arterial hypertension, coronary arteries disease, and cerebral stroke. According to the study conducted in the USA,increase in body weightby every kilogramin an adult person increases the risk of diabetes by 9% [9].

III. Conclusion

Thus, the results of the screening among newly diagnosed type 2 diabetes patients in 6 pilot regions of the Republic revealed the following:

1. The prevalence of DR among newly diagnosed patients with type 2 diabetes in Uzbekistan was 11.5%. DR was mainly revealed in patients atlong-time decompensation state (HbAlc> 9%), which indicates the duration and poor diagnosis of the onset of diabetes.

2. To identify DR in patients with newly diagnosed diabetes, a comprehensive examination of an ophthalmologist should include fundus photography using a fundus camera, which will allow obtaining reliable criteria for changes at the retina and creating a database archive.

3. For the early diagnosis of DR and other eye disorders in patients with diabetes, it is advisable to conduct a screening with a comprehensive ophthalmological examination of the eyes in order to prevent irreversible vision loss.

4. The effective control of various risk factors (blood pressure, glycaemia and lipid metabolism) in prevention of vascular complications of diabetes can significantly slow down the development of microvascular lesions of the retina.

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DOI: 10.37200/IJPR/V24I4/PR201335
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020

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DOI: 10.37200/IJPR/V24I4/PR201335
Received: 22 Sep 2019 | Revised: 13 Oct 2019 | Accepted: 15 Jan 2020