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Epidemiology of Diabetic Retinopathy at Eye Clinic Svjetlost Sarajevo: Two Years Retrospective Single Center Study

Ajla Pidro[1], Melisa Ahmedbegovic-Pjano[1], Senad Grisevic[1], Vernesa Sofic-Drino[1], Kresimir Gabric[2], Alma Biscevic[1,2]

[1]Eye Clinic Svjetlost Sarajevo, Sarajevo, Bosnia and Herzegovina

[2]University Eye Clinic Svjetlost Zagreb, Zagreb, Croatia

Corresponding author:
Alma Biscevic, dr. Mustafe Pintola 23, Sarajevo, Bosnia and Herzegovina. Tel. 060 31 94 709 fax: 033 762 771. E-mail: alma@svjetlost-sarajevo.ba. ORCID ID: http//www.orcid.org/0000-0002-6496-2853.

ABSTRACT

Introduction: Diabetic retinopathy (DR) is an important cause of blindness, and occurs as a result of long-term accumulated damage to the small blood vessels in the retina. 2.6% of global blindness can be attributed to diabetes. Disease severity was most often classified by the Early Treatment Diabetic Retinopathy Study (ETDRS) classification for DR severity. Patients are usually categorized based on the severity of DR as having mild nonproliferative diabetic retinopathy (NPDR), moderate NPDR, severe NPDR, or proliferative diabetic retinopathy (PDR). **Aim:** To evaluate DR status among patients at Eye Clinic Svjetlost Sarajevo , both, type 1 and type 2 DM patients who presented in our clinic at 2 years period – from June 2016 to June 2018. This is single center study. **Methods**: Retrospective analysis of 753 diabetic patients that came for the first check up in our institution during those two years, 363 patients were male and 390 were female. Patients were divided in 3 groups (based on DR changes): a) No changes, b) Nonproliferative DR (with and without Diabetic macular edema – DME), c) Prolipherative DR (with and without DME + Advanced PDR). **Results**: There were 35% of patients with no ocular changes, 41.2% had NPDR and 24% had PDR. Prevalence of DR in our study was 65.32%. Distribution of NPDR was 66.27%, and PDR was 33.73%. DME was present in 33.70% cases. In NPDR, DME was presented in 51% of the cases, while in PDR was presented in 49% of the cases. In state of advanced PDR, PDR was presented in 30.52% cases, tractional detachment and haemophtalmus in 50.20% of cases and neovascular glaucoma in 19.28%. Sixty-three patients ended up with vitro-retinal surgery (8.4%) while in other studies that number is up to 3%. Out of that number 9 patients were patient with virgin eyes (14.28%). Neovascular glaucoma occurred in 19.28% of diabetics with proliferative retinopathy and 4.60% in all of diabetics. **Conclusion:** Diabetic retinopathy status of patients presenting at Eye clinic Svjetlost Sarajevo, Bosnia and Herzegovina is quite poor. There is a big need for early DR screening measures, good prevention and management of DR risk factors. Adequate and ON TIME management of DM and its vision threatening complications is of major importance.

Keywords: Diabetic retinopathy, nonproliferative retinopathy, proliferative retinopathy, Early Treatment Diabetic Retinopathy Study.

1. INTRODUCTION

According to World Health Organization (WHO) the number of people with Diabetes mellitus (DM) has risen from 108 million in 1980 to 422 million in 2014. The global prevalence of diabetes among adults over 18 years of age has risen from 4.7% in 1980 to 8.5% in 2014 (1).

Diabetes prevalence has been rising more rapidly in middle-and low-income countries. It is a major cause of blindness, kidney failure, heart attacks, stroke and lower limb amputation. In 2016, an estimated 1.6 million deaths were directly caused by diabetes. Another 2.2 million deaths were attributable to high blood glucose in 2012. Almost half of all deaths attributable to high blood glucose occur before the age of 70 years. WHO estimates that diabetes was the seventh leading cause of death in 2016. Disorder of the retinal microvasculature eventually develops to some degree in nearly all diabetic patients. Diabetic retinopathy (DR) is an important cause of blindness, and occurs as a result of long-term accumulated damage to the small blood vessels in the retina. 2.6% of global

blindness can be attributed to diabetes (2).

Disease severity was most often classified by the Early Treatment Diabetic Retinopathy Study (ETDRS) classification for DR severity (3).

Usually, patients are categorized based on the severity of DR as having (1) mild nonproliferative diabetic retinopathy (NPDR), (2) moderate NPDR, (3) severe NPDR, or (4) proliferative diabetic retinopathy (PDR).

2. AIM

Aims of the study is evaluation of DR status among patients at Eye Clinic Svjetlost Sarajevo, both, type 1 and type 2 DM patients who presented in our clinic at 2 years period – from June 2016 to June 2018. This is single center study. Other aims are: analysis and comparison of the study results with literature, assessment of primary health care prevention and attempt to establish an algorithm for diabetic patients ophthalmological prevention/treatment.

3. METHODS

Out of 753 diabetic patients that came for the first check up in our institution during those two years, 363 patients were male and 390 were female. Patients were divided in 3 groups (based on DR changes): a) No changes; b) Nonproliferative DR (with and without Diabetic macular edema - DME); c) Prolipherative DR (with and without DME + Advanced PDR). There were 35% of patients with no ocular changes, 41.2% had NPDR and 24% had PDR. Prevalence of DR in our study is 65.32%.

4. RESULTS

Distribution of NPDR was 66.27% , and PDR was 33.73%. DME was present in 33.70% cases. In NPDR, DME was presented in 51% of the cases, while in PDR was presented in 49% of the cases.

In state of advanced PDR, PDR was presented in 30.52% cases, tractional detachment and haemophtalmus in 50.20% of cases and neovascular glaucoma in 19.28%.

Sixty-three patients ended up with vitroretinal surgery (8.4%) while in other studies that number is up to 3%. Out of that number 9 patients were patient with virgin eyes (14.28%).

Neovascular glaucoma occurred in 19.28% of diabetics with proliferative retinopathy and 4.60% in all of diabetics.

5. DISCUSSION

While treatment options such as pan-retinal laser photocoagulation can largely control neovascularization and prevent blindness, these treatments cannot restore vision, and in fact have vision-impairing effects of their own. Intravitreal agents such as anti-vascular endothelial growth factor (VEGF) agents do not fully restore vision in all patients, and require frequent and costly doses for effective treatment. Vision loss from DR or DME is hence a significant healthcare burden (4). Wisconsin Epidemiologic Study of Diabetic Retinopathy, WESDR in the USA, the Wisconsin Epidemiologic Study of Diabetic Retinopathy (WESDR) found that among patients with insulin-dependent diabetes with onset before the age of 30, who are presumed to have type 1 diabetes, the 4-year cumulative incidence of DR was 59.0% (5).

Population-based studies have reported the prevalence of DME in type 1 diabetic patients as 4.2–7.9%, while the rate for type 2 diabetes patients ranges from 1.4–12.8% (6-29). Most popular studies are Beaver Dam Eye Study (30), Exeter Diabetic Retinopathy Screening Program (EDRS) (31), Blue Mountains study (32), Visual Impairment Project (VIP) (33), Arhus County Study (34), Casteldaccia Eye Study (35), Australian Diabetes Obesity and Lifestyle study (AusDiab) (36) and Multiethnic Study of Atherosclerosis (MESA) (37). Neovascular glaucoma occurred in 2.1% of all diabetics and in 21.3% of diabetics with proliferative retinopathy (38). These studies were conducted from 1988 to 2012 in the USA, Australia and Europe. A total of eight studies provided prevalence data for DR, including PDR and DME. Studies included the Beaver Dam Eye Study, Exeter Diabetic Retinopathy Screening Program(EDRS), Blue Mountains study, Visual Impairment Project (VIP), Arhus County Study, Casteldaccia Eye Study, Australian Diabetes Obesity and Lifestyle study (AusDiab) and Multiethnic Study of Atherosclerosis (MESA). All were population-based studies conducted in the USA, Australia and Europe (United Kingdom, Denmark, Italy) using the reference examination for DR diagnosis. Prevalence of in our study showed DR much higher comparing to studies in the Western world. At the same time there was higher rate of PDR and lower rate of NPDR compared to other studies, higher rate of diabetic macular oedema, similar results compared to other studies regarding distribution of DME, higher rate of advanced PDR in need of surgical treatment, extremely high rate of non-treated eyes in need of surgical treatment and similar rate of NVG in DR.

6. CONCLUSION

Diabetic retinopathy status of patients presenting at Eye clinic Svjetlost Sarajevo, Bosnia and Herzegovina is quite poor. Compared to other studies the DR is more advanced in our patients, with higher rate of complication and need for surgical treatment. There is a big need for early DR screening measures, good prevention and management of DR risk factors. Adequate and ON TIME management of DM and its vision threatening complications is of major importance.

- **Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms.
- **Author's contribution:** A.P. gave substantial contribution to the conception or design of the work and in the acquisition, analysis and interpretation of data for the work. Each author had role in drafting the work and revising it critically for important intellectual content. Each author gave final approval of the version to be published and they agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.
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