

Asymmetrical Diabetic Retinopathy may be a Significant Sign of the Mortal Vascular Disorder

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Received date: November 17, 2017; Accepted date: January 8, 2018; Published date: January 15, 2018

Citation: Turgut B (2018) Asymmetrical Diabetic Retinopathy may be a Significant Sign of the Mortal Vascular Disorder. J Eye and Vis. Vol.1 No.1.1

Keywords: Asymmetrical; Diabetic; Retinopathy; Carotid disease; Ocular ischemic syndrome

Abbreviations:

DM: Diabetes Mellitus; ADR: Asymmetric Diabetic Retinopathy; DR: Diabetic Retinopathy; PDR: Proliferative Diabetic Retinopathy; PVD: Posterior Vitreous Detachment; OIS: Ocular Ischemic Syndrome; COD: Carotid Obstructive Disease

Introduction

Diabetes mellitus (DM) is a systemic disease having ocular involvement and complications. Diabetic retinopathy (DR) is a retinal microangiopathy resulting vasodegenerative changes including the breakdown of the inner blood-retinal barrier, basement membrane thickening, the selective loss of pericytes in capillary wall and capillary degeneration in retinal vasculature. However, recent evidence shows that DR is also a neurodegenerative disorder affecting retinal neurons and glial cells. DR may be classified according to the presence or absence of retinal neovascularization (NV) as "non-proliferative (background/preproliferative) retinopathy (NPDR)" and "proliferative retinopathy (PDR)". Additionally, DR may also be divided to five stages including "no apparent retinopathy" which there are no diabetic fundus changes, "mild NPDR" characterized by the presence of a few retinal microaneurysms, "moderate NPDR" characterized by the presence of microaneurysms, intraretinal hemorrhages or venous beading, "severe NPDR" characterized by the 4:2:1 rule (the presence of microaneurysms in 4 retinal quadrants, intraretinal hemorrhage in 2 retinal quadrants and venous beading in one retinal quadrant) of the ETDRS and "PDR" characterized by the presence of NV of the optic disc, retina, iris, angle, and/or vitreous gel hemorrhage or tractional retinal detachment according to the presence of microaneurysms, intraretinal hemorrhages and venous beadings. Although DR occurs in a symmetric manner in a great majority of the patients, asymmetric diabetic retinopathy (ADR) is out of this rule. ADR is a rare form of DR. ADR develops in 5-10% of the patients with PDR in 0.14% of subjects with type 2 DM [1-3]. ADR is defined as the presence of PDR in one eye with the non-proliferative/pre-proliferative/background DR or no DR in the other eye lasting for at least two years [1-5].

In recent clinical studies and reports, it has been considered that some systemic and ocular factors have been associated with

the development of ADR [1-7]. These risk factors include the cataract surgery with vitreous loss, trauma, uveitis, endophthalmitis, optic atrophy, elevated intraocular pressure, ocular ischemic syndrome (OIS), carotid obstructive disease (COD), branch retinal vein occlusion, posterior vitreous detachment (PVD), associated retinal vascular disease, retinitis pigmentosa, retinal pigment epithelial atrophy, chorioretinal atrophy and scarring, radiation, anisometropia, amblyopia and myopia over 5 D [1-7]. The conditions, with especially the unioocular involvement which may be protective against the progression of PDR and the development of DR such as Fuch's iridocyclitis syndrome, complete PVD, optic atrophy and high myopia cause ADR [7-11]. However, the protective mechanisms in these diseases have not been clearly explained to date.

The importance of ADR origins from the existence of the unilateral OIS and COD in the etiology of ADR. These disorders are strongly associated atherosclerosis, ischemic heart disease, cerebrovascular accident, stroke, cerebral infarction or embolization, peripheral vascular disease, hypertension, sudden death and the severe damage to vital organs [3,12]. Recent data shows that the stenosis on or over 90% of the ipsilateral internal carotid artery presents clinically as OIS. Additionally, it has been reported that approximately 70% of the patients with COD may initially present with the OIS [12]. So, the detection of ADR should caution to the ophthalmologist for the direction the patient to cardiology clinic for detailed examination and the radiologic evaluation of internal carotid and ophthalmic artery.

In conclusion, asymmetric diabetic retinopathy may be a significant sign of the mortal systemic disease or vascular disorder. When ADR was detected, prompt further investigation is critical for the detection of COD and OIS because these have a strong association with high morbidity and mortality due to ischemic heart disease and cerebrovascular accidents.

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