RISK OF BILATERAL IDIOPATHIC PRERETINAL MACULAR FIBROSIS

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SUMMARY

To ascertain the risk of the development of bilateral idiopathic preretinal macular fibrosis, we retrospectively studied 380 consecutive patients with idiopathic preretinal macular fibrosis. Eighty (21%) patients had bilateral involvement. Sixteen (39%) of 41 patients with diabetes, 40 (28%) of 144 with hypertension, and 12 of 21 (57%) with bilateral high myopia had bilateral involvement. The prevalence of bilateral involvement was significantly higher in patients with these three pathologies than in patients without these conditions ($p<0.01$, $p<0.02$ and $p<0.01$, respectively). In patients with diabetes or hypertension, no significant difference was found in the prevalence of posterior vitreous detachment (PVD) between involved or uninvolved eyes. Diabetes, hypertension even without retinopathy, and high myopia may be risk factors for bilateral involvement of idiopathic preretinal macular fibrosis. Factors other than PVD may be involved in the development of idiopathic preretinal macular fibrosis in patients with diabetes or hypertension.

Idiopathic preretinal macular fibrosis causes decreased visual acuity and metamorphopsia, particularly in the sixth decade onwards.[1–6] The prevalence of bilateral involvement has been reported to be approximately 20%.[2,3,5–7] Although the visual acuity reduction is frequently mild and rarely deteriorates to less than 6/60,[1–6] patients affected bilaterally are more disabled, with decreased mobility and impaired reading ability. Thus, knowledge of patients at risk of developing bilateral idiopathic preretinal macular fibrosis can facilitate clinical management.

We investigated the risk of developing bilateral idiopathic preretinal macular fibrosis and demonstrated that diabetes, hypertension even without retinopathy, and high myopia might be risk factors.

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PATIENTS AND METHODS

We retrospectively studied 380 patients with idiopathic preretinal macular fibrosis who underwent comprehensive bilateral ocular examinations between 1977 and 1993 at Retina Associates, Boston. Patients ranged in age from 18 to 88 years (median 64 years); 296 (78%) of the 380 patients were 60 years and older. Two hundred and nine (55%) subjects were women and 171 (45%) were men.

The definition of idiopathic preretinal macular fibrosis was the absence of any prior ocular surgery or prior or concurrent ocular disease. Patients with a history of ocular disease, such as retinal breaks, ocular inflammation, retinal vein occlusion, diabetic or hypertensive retinopathy, or macular degeneration, and ocular surgery or trauma were excluded. Patients with diabetes without retinopathy indicated by fluorescein angiography, and those with hypertension with mild retinal arterial sclerosis alone were included. Four patients with significant cataract, which caused visual acuity deterioration, were excluded from the study.

All patients underwent complete ocular examinations, including best corrected visual acuity measurement using the Snellen chart, slit lamp biomicroscopy, indirect ophthalmoscopy with scleral depression, colour fundus photography and vitreous study. Visual acuities were divided as follows: 20/40 or better, 20/50 to 20/100, and poorer than 20/100.[5] The vitreous condition was studied and documented photographically with a +58.6 dioptre preset lens (El Bayadi-Kajiura lens) with a photo-slit lamp, which allowed observation of the dynamics of the vitreoretinal relationships and minimised the risk of misdiagnosing a large lacuna as posterior vitreous detachment (PVD).[8] We classified the posterior vitreous findings on the basis of the presence or absence of PVD. Hypertension was defined as a

Table I. Relationship between right and left visual acuities in 80 patients with bilateral idiopathic preretinal macular fibrosis

	Visual acuity of left eye		
Visual acuity of right eye	20/40 or better	20/50 to 20/100	Poorer than 20/100
20/40 or better	29 (36)	14 (18)	4 (5)
20/50 to 20/100	12 (15)	9 (11)	3 (4)
Poorer than 20/100	2 (3)	3 (3)	4 (5)

Values are the number of patients (%).

systolic pressure greater than 160 mmHg and a diastolic pressure greater than 95 mmHg on two or more occasions, or a history of hypertension that was under the care of a physician.[9] High myopia was defined as more than −6 dioptres of spherical equivalent.[10]

The chi-squared test with Yates' correction or Fisher's exact test, and the Mann-Whitney *U*-test were used for statistical analysis.

RESULTS

Eighty (21%) of 380 patients (160 eyes) had bilateral idiopathic preretinal macular fibrosis. A total of 460 eyes had preretinal macular fibrosis and the remaining 300 eyes were normal. The time of symptom onset, i.e. decreased or distorted vision, was recorded in 363 eyes. Three hundred and ten patients (371 eyes) with idiopathic preretinal macular fibrosis underwent fluorescein angiography. The mean duration from symptom onset to the initial examination was 10 months; 215 (59%) eyes were initially examined within 6 months of symptom onset.

Of 80 patients with bilateral involvement, 42 (53%) had visual acuities in the same visual range in both eyes. Nineteen (23%) patients had bilateral visual acuity poorer than 20/40 (Table I).

Of 380 patients, 41 had diabetes, 144 had hypertension and 21 had bilateral high myopia. Sixteen (39%) patients with diabetes, 40 (28%) patients with hypertension and 12 (57%) patients with bilateral high myopia had bilateral idiopathic preretinal macular fibrosis. The prevalence of bilateral involvement was significantly higher in patients with these pathologies than in other patients with idiopathic preretinal macular fibrosis ($p<0.01$, $p<0.02$ and $p<0.01$, respectively). Five patients had both diabetes and hypertension. Two patients with either diabetes or hypertension had high myopia. No difference was found in the mean duration from symptom onset to the examination between patients with and without each condition.

Of 460 eyes with idiopathic preretinal macular fibrosis, 345 (75%) had PVD. However, 184 (61%) of 300 fellow eyes without the disorder had PVD. The prevalence of PVD was significantly higher in eyes with the disorder than in eyes without ($p<0.01$). In 82 eyes of 41 patients with diabetes, PVD was found in 42 (74%) of 57 eyes with idiopathic preretinal macular fibrosis, and in 19 (76%) of 25 eyes without. There was no significant difference in the prevalence of PVD between involved or uninvolved eyes. In 288 eyes of 144 patients with hypertension, 127 (69%) of 184 eyes with idiopathic preretinal macular fibrosis, and 68 (65%) of 104 eyes without the disorder had PVD. No significant difference was found in the prevalence of PVD between eyes with and without the disorder. In 42 highly myopic eyes of 21 patients, PVD was found in 30 (90%) of 33 eyes with the disorder and in 5 (56%) of 9 eyes without. The prevalence of PVD was significantly higher in eyes with the disorder than in eyes without ($p<0.01$). The prevalence of PVD in eyes with idiopathic preretinal macular fibrosis was 78% (151/193) when diabetes, hypertension and high myopia were excluded – not a statistically significant difference compared with the prevalence for all eyes with idiopathic preretinal macular fibrosis (75%).

Fluorescein leakage into the macula with or without cystoid macular changes was found in 104 (28%) of 371 eyes. There was no significant differences in fluorescein leakage into the macula between eyes with idiopathic preretinal macular fibrosis in patients with diabetes or hypertension and eyes with idiopathic preretinal macular fibrosis with PVD without these systemic diseases.

DISCUSSION

The prevalence of bilateral idiopathic preretinal macular fibrosis was 21% in this series, which was consistent with previous reports.[2,3,5–7] Furthermore, our results were similar to those of previous studies[1–7] regarding patient age, distribution of sex and visual acuity, and the prevalence of PVD, which is thought to predispose to the disorder.[3–6,11]

Our study demonstrated that diabetes, hypertension and high myopia are risk factors for bilateral development of idiopathic preretinal macular fibrosis. The mechanism of the formation of idiopathic preretinal macular fibrosis is not well known; however, breaks in the internal limiting lamina of the retina that develop as a consequence of separation of the posterior hyaloid from the retina are thought to cause this disorder.[3–6,11] PVD develops more frequently in patients with diabetes even without retinopathy or in patients with high myopia,[10–13] and commonly develops at about the same time in both eyes.[12] Furthermore, systemic disease influences both eyes, and generally patients

with high myopia suffer bilaterally.[10] These findings may explain the high prevalence of bilateral idiopathic preretinal macular fibrosis in patients with diabetes or high myopia.

However, in patients with diabetes or hypertension in this series, no difference was found in the prevalence of PVD between eyes with and without idiopathic preretinal macular fibrosis, suggesting that factors other than PVD promote the development of bilateral idiopathic preretinal macular fibrosis. Fibrous astrocytes, fibrocytes, retinal pigment epithelial (RPE) cells and myofibrocytes have been implicated frequently in preretinal macular fibrosis.[11,14–18] Migration of glial cells or RPE cells may be mediated by both biochemical and physiological factors, such as chemoattractants in serum, vascular endothelial cells and substances released from RPE cells themselves.[19–22] Smiddy and associates[18] speculated that those mediators and other undescribed biochemical interactions might mediate cell migration and proliferation and consequently form preretinal macular fibrosis. In patients with diabetes, increased permeability of the blood–retinal barrier (BRB) before the onset of diabetic retinopathy has been described.[23–25] Therefore, in patients with diabetes or hypertension even without retinopathy, chemoattractants from serum or vascular endothelial cells, aided by the increased permeability of the BRB, may mediate cell migration and proliferation and result in promoting the development of preretinal macular fibrosis.

In the present study, 23% of patients with bilateral idiopathic preretinal macular fibrosis had a visual acuity of 20/50 or worse in both eyes. These patients have more limitations in daily life than patients with unilateral involvement. Thus, knowledge of the high-risk condition of bilateral involvement is essential to the clinical management of patients with this disorder. Although this series is limited because of the small sample of patients with bilateral involvement, our results strongly suggest that patients with diabetes, hypertension or high myopia have an increased risk of developing bilateral idiopathic preretinal macular fibrosis.

Key words: Bilateral idiopathic preretinal macular fibrosis, Diabetes, High myopia, Hypertension, Posterior vitreous detachment.

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