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BRANCH RETINAL VEIN OCCLUSION: A STUDY OF RISK FACTORS IN WESTERN INDIA

Ophthalmology

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ABSTRACT

- **Objective:** This study is aimed to determine the most common risk factor of branch retinal vein occlusion in Indian population.
- **Design:** It is a retrospective, observational studybased on hospital records.
- **Subjects:** 300 eyes of 300 patients were studied, out of which 236 were men (78%) and 64(21.3%) were women. The age of patients ranged from 60 to above 90 years.
- **Analysis:** Most common risk factors and most common site of branch retinal vein occlusion were analyzed.
- **Results:** Out of 300 patients 64 %(192) patients had hyperlipidemia , 26%(78) patients had hypertension and 6%(18) patients had glucose intolerance and 4%(12) patients had unknown cause.
- **Conclusion:** The retrospective study showed that hyperlipidemia was the most common cause.

KEYWORDS

Branch Retinal Vein Occlusion(BRVO), hyperlipidema

INTRODUCTION:

Retinal vein occlusion (RVO) is the most common retinal vascular disease. There are three distinct types of retinal vein occlusion: branch retinal vein occlusion (BRVO) , central retinal vein occlusion(CRVO) and an anatomical variant of CRVO namely hemi retinal vein occlusion(HRVO).

The first case of BRVO was reported by Leber in 1877.[1]Koyanagi[2]in 1928 first reported the association between BRVO and arterio-venous crossing, and now it is well established that site of occlusion in BRVO is invariably at the arterio-venous crossing [3,4,5,6]. BRVO is twice as common as CRVO and more than 10 times as common as HRVO. BRVO develops at arterovenous crossing sites where the artery passes anteriorly (superficially) to the vein. The arterio-venous crossings have been shown to be more frequent in the supero-temporal quadrant than elsewhere [7, 8] and situated closer to the optic disc in the supero-temporal than infero-temporal quadrant.[8]This may be because of higher risk of occlusion in this area or may be due to increased diagnosis due to increased symptoms of temporal versus a nasal occlusion.

BRVO is associated with arteriosclerotic changes in the retinal arterioles. The resultant thickening of the artery causes compression of adjacent vein, a process that may be aggravated because at arteriovenous crossing site the two vessels are confined within a common adventitial sheath.[9]

The arterio-venous crossing plays an important role in the pathogenesis of BRVO, and that the anterior position of the arteriole at the crossing somehow renders the underlying vein vulnerable to occlusion. The clinical picture and fluorescein angiographic studies in BRVO do show the site of obstruction to blood flow in the retinal vein at the arteriovenous crossing. From this clinical information it would seem logical to assume that sclerotic retinal arteriole probably compresses the accompanying vein because of a common thickened, adventitial and glial sheath; however, histopathological studieshave so far failed to confirm this view. Moreover, the very low incidence of BRVO in spite of the very high incidence of anterior location of the arteriole at the arterio-venous crossing in patients with arteriosclerosis and hypertension clearly indicates that, in the multifactorial etiology of BRVO, factors other than simple anatomical arrangement must play important roles. In addition to all that, focal phlebitis is a well known cause of BRVO, e.g., in toxoplasmic chorio-retinitis and retinal vasculitis. Similarly BRVO is seen in dysproteinemias, sickle cell disease and other hematologic disorders. Unlike CRVO and HCRVO, glaucoma and raised IOP play no role in the pathogenesis of BRVO.[10]

The eye disease case control study group reported 'cardio vascular risk profile 'as a risk factor for BRVO.[11] A significantly increased risk was found for systemic hypertension, history of cardiovascular disease, smoking, increased body mass index and higher levels of serum alpha-2 globulin.

SUBJECT AND METHODS:

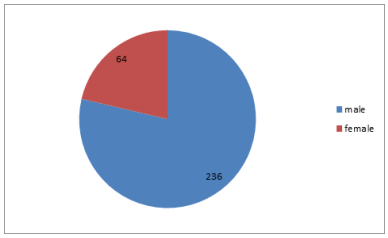
In a retrospective, observational study,300 eyes of 300 patients from January 2015 to December 2017 at a tertiary eye institute in Western India were studied. The review of medical records of all patientsincluded the age of the patient, fundus photograph and basic blood investigations like complete blood count, lipid profile and diabetic profile of the patient. Inclusion criteria were patients with branch retinal vein occlusion on fundus photograph. Eyes with significant media opacities resulting in non visualization of fundus and patients with multifactorial disorders were excluded.

Statistical analysis was performed to determine various etiologies found in these patients.

RESULTS:

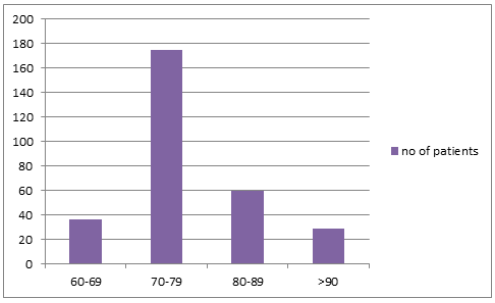
Out of 300 patients 236(78%) were males and 64(21.3%) were females.

CHART 1: male and female ratio of our study



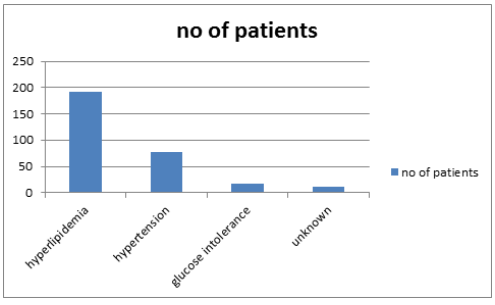
Out of the 300 patients 36 patients belonged to the age group of 60-69 years, 175 patients belonged to 70-79 years, 60 belonged to 80-89 years and 29 patients were above 90 years of age.

CHART 2: age distribution in our study



Out of 300 patients 64 %(192) patients had hyperlipidemia , 26%(78) patients had hypertension and 6%(18) patients had glucose intolerance and 4%(12) patients had unknown cause.

CHART 3: comparison of risk factors in BRVO



DISCUSSION:

Branch retinal vein occlusion is a common retinal vascular disorder and a common cause of visual loss in middle aged and elderly people. BRVO has many known ophthalmic and systemic risk factors including age, hypertension, hyperlipidemia, ocular hypertension, and glaucoma.[12,13]There is a significant association of advancing age with BRVO, and the incidence of BRVO increases with age. The prevalence of BRVO is 0.157 per 100 in 40-49 year olds, 0.458 per 100 in 50-59 year olds, 1.11 per 100 in 60-69 year olds, and 1.276 per 100 in 70-79 year olds.[14]

Our study supports the above result showing prevalence of 0.12 per 100 in 60-69 years old, 0.58 per 100 in 70-79 years, 0.2 per 100 in 80-89 years.

Other study on "clinical study of branch retinal vein occlusion" showed that the average age of affected population in their study was 62 years. In our study the average age of patients is 70 years.[15]
A large meta-analysis by O'Mahoney et al showed a significant association of hypertension and hyperlipidemia with BRVO. However, there was no association of diabetes mellitus with BRVO (unlike the association found with CRVO in the same study).[16]Other factors that are significantly associated with BRVO are glaucoma and body mass index (BMI).[17] BRVO is uncommon in patients younger than 50 years and there is a significant association of BMI with BRVO in patients younger than 50 years.

"Clinical study of branch retinal vein occlusion "showed that out of 100 patents 80 had hypertension, 38 had deranged lipid levels and 10 were diabetic. In our study our of 300 patients 192 had dyslipidemia, 78 patients had hypertension and 18 patients had glucose intolerance thus making dyslipidemia and hypertension the most common causes of BRVO.[15]

A study carried out in younger population (mean age of 38.45) to determine the risk factor showed that out of 52 patients 33 had dyslipidemia, 22 had hypertension, 17 had diabetes.

Isolating the major risk factors for BRVO can help in prevention by altering this modifiable risk factor. Also BRVO can also serve as the severity of the systemic disease associated with it and can serve as a marker for prognosis of the disease as retinal vessels are end arteries suggesting end organ damage.

CONCLUSION:

The retrospective study showed that in branch retinal vein occlusion and hyperlipidemia was the most common cause at a tertiary center of western India so screening and control of these factors can help in proper planning of a proper preventive strategy for these patients.

Acknowledgement-None

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