



Original Research Article

A study of ocular morbidities associated with retinal vein occlusion

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ABSTRACT

Purpose: To study the ocular morbidities associated with retinal vein occlusion.

Materials and Methods: Ours was a cross-sectional observational study, carried out on 100 patients of Retinal Vein Occlusion in a tertiary care centre of Western Maharashtra. After written and informed consent, detailed history was taken, vision assessed, detailed slit lamp evaluation and dilated fundus examination was done. Fundus camera was used to obtain fundus photographs. Macular edema was confirmed using OCT.

Diagnosed cases of RVOs were then looked for complications like Macular Edema, Vitreous Haemorrhage, Disc Neovascularisation, Iris/Neovascularisation.

Result: Vitreous haemorrhage was the most common complication noted (18%), followed by macular edema (10%), iris neovascularisation (3%) and disc neovascularisation (3%). Macular edema was the most common complication in BRVO, vitreous haemorrhage in CRVO. The incidence of ocular complications was higher in patients with CRVO compared to patients with BRVO and HRVO.

Conclusion: Various complications associated with RVO can lead to permanent blindness. Hence early detection of these can help reduce the burden of blindness in society.

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1. Introduction

After diabetic retinopathy, retinal vein occlusions (RVOs) are the second most common retinal vascular disease.¹ They can cause a significant vision loss, if untreated.² It is an obstruction of the retinal venous system which can be central retinal vein occlusion [CRVO] or a branch retinal vein occlusion (branch retinal vein occlusion [BRVO]) or hemi retinal vein occlusion [HRVO]. Patients with RVO may develop ocular complications like macular edema and VH. Macular edema develops over one year in 5–15% of eyes with RVO.³

The exact pathogenesis of CRVO remains obscure. Obstruction is the result of a thrombus sitting in the central retinal vein at home or at the posterior lamina cribrosa.

Arteriosclerosis of the central retinal vein and artery, causes changes in venous flow and then endothelial changes. An alternative theory is that the central retinal vein thrombosis is an end-stage phenomenon, induced by a variety of primary lesions such as compression or inflammation of the optic nerve or orbital structural abnormalities or changes in the lamina cribrosa. Systemic risk factors like hypertension, dyslipidemia, diabetes mellitus, and heart disease, causing RVO can be explained by the concept of Virchow's triad (endothelial damage, hypercoagulability, abnormal blood flow).

2. Materials and Methods

Ours was a cross sectional observational study carried out in the Ophthalmology Department, of a tertiary care hospital in Western Maharashtra during September 2017 to August 2019. The sample size at 95% confidence level is 100

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patients to be enrolled in the study.

2.1. Inclusion criteria

Patients diagnosed with CRVO, BRVO, HRVO.

2.2. Exclusion criteria

1. Cataract and other media opacities (fundus details not seen).
2. Other associated acute ocular morbidity like uveitis.

3. Method of study

Institute Ethical Committee clearance, written and informed consent was obtained from all the participants, prior to the examination. The study purpose was informed and explained to them.

Name, age, gender of the patient was noted. History of present illness was asked. History of trauma to either eyes was asked. History of any ocular procedures was asked. History of systemic illness was taken.

All the participants underwent a thorough ophthalmologic examination. Vision was assessed using illuminated Snellen's Chart. Detailed slit lamp evaluation was done. Dilated funduscopy was done using direct ophthalmoscope, indirect ophthalmoscope and slit lamp biomicroscopy. Intra ocular pressure was checked using applanation tonometer. Fundus photographs were obtained using fundus camera. Optical Coherence Test was done in certain cases to confirm the presence of macular edema, where needed.

Diagnosed cases of RVOs were then looked for the following complications:

1. Macular Edema (ME).
2. Vitreous Haemorrhage (VH).
3. Iris Neovascularisation (INV).
4. Disc Neovascularisation (DNV).

3.1. Statistical analysis

Mean and Standard deviation, Frequency and percentage table was used for quantitative and qualitative analysis. Association among the study groups was assessed using Fisher test, Student 't' test and Chi-Square test. 'p' value less than 0.05 was considered significant. MS Excel, SPSS ver. 20 was used for statistical analysis. Graphical representation was done using MS Excel 2010.

4. Observations and Results

BRVO was found in 52(52%) patients, CRVO in 40 (40%) patients and HRVO in 8 (8%) patients.

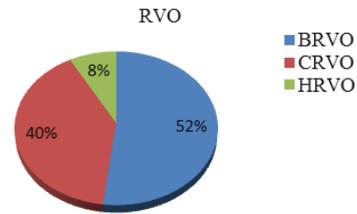


Fig. 1: Distribution of patients according to type of RVO

4.1. Association of Best Corrected Visual Acuity (BCVA) and Retinal Vein Occlusion (RVO)

5 (5%) patients with BRVO had best corrected visual acuity (BCVA) of $>6/18$ while 11 (11%) and 37 (37%) patients had BCVA in the range of $6/18 - 6/60$ and $<6/60$ respectively. 3 (3%) patients with CRVO had BCVA of $>6/18$ while 8 (8%) and 29 (29%) patients had BCVA in the range of $6/18 - 6/60$ and $<6/60$ respectively. 1 (1%) patient each with HRVO had BCVA of $>6/18$ and $6/18 - 6/60$ while 6 (6%) patients had BCVA in the range of $<6/60$. The association of BCVA and RVO was statistically not significant ($p > 0.05$).

4.2. Association of Ocular complications and Retinal Vein Occlusion (RVO)

12 (12%) patients with BRVO had Macular Edema (ME). 17 (17%) patients with CRVO had Vitreous Hemorrhage (VH) while 8 (8%) and 3 (3%) patients had ME and Iris Neovascularization (INV) respectively. 3 (3%) patients had Disc Neovascularization (DNV). 1 (1%) patient with HRVO had VH. The incidence of ocular complications was higher in patients with CRVO as compared to patients with BRVO and HRVO ($p < 0.05$).

5. Discussion

In this hospital based cross-sectional observational study 100 patients were enrolled to study the ocular morbidity and risk factors of RVO. BRVO was found in 52 (52%) patients. CRVO in 40 (40%) patients and hemi retinal vein occlusion (HRVO) in 8 (8%) patients.

In the present study, 5 (5%) patients with BRVO had best BCVA of $>6/18$ while 11 (11%) and 37 (37%) patients had BCVA in the range of $6/18 - 6/60$ and $<6/60$ respectively. 3 (3%) patients with CRVO had BCVA of $>6/18$ while 8 (8%) and 29 (29%) patients had BCVA in the range of $6/18 - 6/60$ and $<6/60$ respectively. 1 (1%) patient each with HRVO had BCVA of $>6/18$ and $6/18 - 6/60$ while 6 (6%) patients had BCVA in the range of $<6/60$. The association of BCVA and RVO was statistically not significant as per Chi-Square test ($p > 0.05$). Similar observations were noted in the studies of Fiebai B et al⁴ and Sankar B et al.^{4,5}

Sankar B et al.^{4,5} reported that 4% cases of CRVO and 50% cases of HCRVO presented with less than $6/60$ visual

Table 1: Association of BCVA and RVO

Type of Occlusion	BCVA						Total		p value
	>6/18		6/18 – 6/60		<6/60		N	%	
	N	%	N	%	N	%			
BRVO	5	5%	11	11%	37	37%	52	52%	>0.05
CRVO	3	3%	8	8%	29	29%	40	40%	
HRVO	1	1%	1	1%	6	6%	8	8%	
Total	9	9%	20	20%	72	72%	100	100%	

Table 2: Association of ocular complications and RVO

Type of Occlusion	Ocular complications								p value
	VH		ME		INV		DNV		
	N	%	N	%	N	%	N	%	
BRVO	0	-	12	2%	0	-	0	-	<0.05
CRVO	17	17%	8	8%	3	3%	3	3%	
HRVO	1	1%	0	-	0	-	0	-	

acuity. While among cases of BRVO, this number was 49%.

In our study, 12 (12%) patients with BRVO had Macular Edema (ME). 17 (17%) patients with CRVO had Vitreous Hemorrhage (VH) while 8 (8%) and 3 (3%) patients had ME and Iris Neovascularization (INV) respectively. 3 (3%) patients had Disc Neovascularization (DNV). 1 (1%) patient with HRVO had VH. The incidence of ocular complications was much more in CRVO patients as compared to those with BRVO and HRVO ($p < 0.05$). This is comparable to the studies of Sankar B et al.^{4,5} Fiebai B et al.⁴ and Prajapati VA et al.⁶

Sankar B et al.^{4,5} reported that 9 of the 13 cases of CRVO had macular edema, 4 cases showed CNP. 4 out of 35 cases of BRVO, showed areas of capillary non perfusion (CNP) alone, without neovascularisation, out of which 1 had CNP more than 5 DD. Evidence of NVD/NVE was seen in 4 cases, 20 cases had macular edema and both neovascularization and macular edema was present in 2 cases.

Fiebai B et al.⁴ study assessing the incidence and risk factors of RVO, reported that macular edema, vitreous hemorrhage, neovascularization (both iris and disc) were the ocular complications associated with RVO. These were seen in 19 (70.4%) out of the 27 cases. Patients with CRVO (94.7%) had the maximum complications and VH (52.6%) was the most common complication.

Prajapati VA et al.⁶ observed that, vision loss was more in CRVO than BRVO. Macular edema was found to be the most common complication, reported in 43 (86%) patients, and neovascular glaucoma was found in 10 (20%) patients.

6. Conclusion

Sight threatening complications are seen to occur in RVOs. Hence a prompt diagnosis of the condition is of utmost importance. Various modalities to treat these complications can then be used and help in significantly reducing the burden of blindness.

7. Source of Funding

None.

8. Conflict of Interest

None.

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