



HYPERHOMOCYSTEINEMIA, AXIAL LENGTH, HYPERLIPIDEMIA AS RISK FACTORS TO RETINAL VEIN OCCLUSION

Ophthalmology

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ABSTRACT

BACKGROUND: Retinal vein occlusion is the second most common retinal vascular entity after Diabetic Retinopathy. Retinal vein occlusion (RVO) is an obstruction of the retinal venous system by thrombus formation and may involve the central, hemi-central or branch retinal vein. The most common aetiological factor is compression by adjacent atherosclerotic retinal arteries. Other possible causes are external compression or disease of the vein wall e.g. vasculitis.

METHODS: This study was carried out at C.H.Nagri Eye Hospital on 70 eyes having venous occlusion. Out of which 30 cases had CRVO and 40 cases had BRVO. All the patients included were measured axial length with A-scan, plasma homocysteine level, blood lipid profile level.

RESULTS: Venous occlusion was more common in axial length between 22.01-23.00mm [Mean 22.57 mm] 41.43%, in CRVO 40% [Mean 22.45mm], in BRVO 72.50% [Mean 22.66mm]; High plasma homocysteine level was present in 11 cases [36.67%] of CRVO and 15 cases [37.5%] of BRVO; High lipid profile level was present in 8 cases [26.67%] of CRVO and 6 cases [8.57%] of BRVO.

CONCLUSION: Shorter axial length, hyperhomocysteinemia, hyperlipidemia are risk factors for retinal vein occlusion.

KEYWORDS

Hyperhomocysteinemia, axial Length, hyperlipidemia, retinal Vein Occlusion

BACKGROUND

Retinal vein occlusion (RVO) is the second most common retinal vascular entity after Diabetic Retinopathy. Hyperlipidemia is a common risk factor for RVO in adults.¹ Retinal vein occlusion in persons aged 43 to 69 years may signal a doubling of the risk of cardiovascular mortality.² Elevated plasma total homocysteine (tHcy) is an independent risk factor for retinal vascular occlusive disease and assessment of tHcy may be important in the investigation and management of patients with retinal vascular occlusive disease.³ In addition studies have also shown that hyperhomocysteinemia is a risk factor for central retinal vein occlusion and may suggest a poor prognosis in patients with central retinal vein occlusion.⁴ In previous studies it is proven that shorter axial length could be a risk factor for developing CRVO and BRVO, in short the axial lengths of affected eyes in retinal vein occlusion patients tend to be shorter than those of unaffected eyes.⁵

Retinal vein occlusion is major cause of vision loss. A basic risk factor for RVO is advancing age. Further risk factors include systemic conditions like hypertension, arteriosclerosis, diabetes mellitus, hyperlipidemia, hyperhomocysteinemia, vascular cerebral stroke, blood hyperviscosity, and thrombophilia and structurally short axial length of eyeball.

OBJECTIVES

1. Correlation of high plasma homocysteine with RVO.
2. Correlation of hyperlipidemia with RVO.
3. Correlation of axial length of eyeball with RVO.

METHODS

Total 70 eyes were studied for etiology of venous occlusion at C.H.Nagri Eye Hospital. Out of which 30 cases had CRVO and 40 cases had BRVO. All the patients included were measured axial length with A-scan, plasma homocysteine level, blood lipid profile level.

Selection of Cases

Patients with venous occlusion either CRVO or BRVO with clear fundus visibility and associated with risk factors were included in the study. Patients which were associated with other retinal pathology like Diabetic retinopathy, Hypertensive retinopathy, vitreous

haemorrhage, retinal detachment and not associated with any risk factors were excluded.

RESULTS

70 eyes having venous occlusion with visible fundus, with or without macular oedema and with or without neovascularisation were included in the study. 30 cases of CRVO and 40 cases of BRVO included in the study.

TABLE-1
AGE DISTRIBUTION

Age (Yrs.)	Number of Eyes having CRVO	Number of Eyes having BRVO	Total	Percentage
30	1	1	2	2.86
31 – 40	4	4	8	11.43
41 – 50	4	4	8	11.43
51 – 60	11	19	30	42.86
61 – 70	6	7	13	18.57
71	4	5	9	12.86
Total	30	40	70	100.0

In this study we found highest cases of venous occlusion in age group 51-60 years (Mean 57.36 years) 42.86%. In case of CRVO 36.67% patients were in age group 51-60 years (Mean 57.13 years). In case of BRVO 47.5% patients were in age group 51-60 years (Mean 57.52 years).

TABLE-2
GENDER DISTRIBUTION

Sex	Number of eyes having CRVO	Number of eyes having BRVO	Total	Percentage
Male	22	22	44	62.86
Female	8	18	26	37.14
Total	30	40	70	100.00

Venous occlusion was more common in male. Around 44 cases (62.86%) of male patients were detected in this study. In case of CRVO 22 cases (73.33%) of male and in BRVO 22 cases (55%) of male patients were detected.

TABLE-3
CORRELATION OF HIGH PLASMA HOMOCYSTEINE LEVEL WITH RVO

Plasma Homocysteine	No.of Eyes having CRVO	No.of Eyes having BRVO	Total	Percentage
High level	11	15	26	37.14
Normal	19	25	44	62.86
Total	30	40	70	100.00

This study showed high plasma homocysteine level in 15 (37.5%) BRVO cases and 11 (36.67%) CRVO cases.

TABLE-4
CORRELATION OF HYPERLIPIDEMIA WITH RVO

Lipid Profile	No.of cases CRVO	No.of cases BRVO	Total	Percentage
High	8	6	14	20.00%
Normal	22	34	56	80.00%
Total	30	40	70	100.00%

This study showed high lipid profile level in 6 (8.57%) BRVO cases and 8 (26.67%) CRVO cases.

TABLE-5
CORRELATION OF VENOUS OCCLUSION AND AXIAL LENGTH

Axial Length	CRVO	BRVO	Total	Percentage
< 20				
20.01 – 21.00	3	2	5	7.14%
21.01 – 22.00	5	6	11	15.71%
22.01 – 23.00	12	17	29	41.43%
23.01 – 24.00	10	13	23	32.86%
24.01 – 25.00	0	2	2	2.86%
> 25	0	0	0	0
Total	30	40	70	100.00%

Venous occlusion was more common in Axial length between 22.01 – 23.00 mm (Mean 22.57 mm) in 29 (41.43%) cases and in CRVO it was (Mean 22.45) in 12(40%) cases and in BRVO it was in (Mean 22.66 mm) 17(72.50%) cases.

DISCUSSION

Retinal vein occlusion is more common than the artery occlusion. It typically affects elderly patients in fifth or sixth decade of life. RVO is major cause of vision loss. Risk factors include systemic conditions like hyperlipidemia, hyperhomocysteinemia, vascular cerebral stroke, blood hyperviscosity, and thrombophilia and structurally short axial length of eyeball.

Majority of the patients of RVO in this study were in advanced age i.e. in an age group of 51 to 60 years. The males were having a more prevalence of RVO as compared to females.

This data correlates with study done on 74 patients having RVO by Andrew K. Kine et al.⁶ suggest that high plasma homocysteine levels are more commonly detected in RVO as in our study high plasma homocysteine level in 15 (37.5%) BRVO cases and 11 (36.67%) CRVO cases.

This data corresponds with study done on 2916 cases and 28646 controls by Paul R.A. O'Mahorey et al.⁷ hyperlipidemia is more common in RVO as in our study high lipid profile level in 6 (8.57%) BRVO cases and 8 (26.67%) CRVO cases.

This data is congruous with study done on 37 patients with CRVO and 46 patients with BRVO by Szigeti, A. Et al.⁸ suggest that Shorter Axial Length might be a potential anatomical predisposing factor for development either of CRVO or BRVO as in our study Venous occlusion was more common in Axial length between 22.01 – 23.00 mm (Mean 22.57 mm) in 29 (41.43%) cases and in CRVO it was (Mean 22.45) in 12(40%) cases and in BRVO it was in (Mean 22.66 mm) 17(72.50%) cases.

There are many studies in the literature which has emphasized the risk factors associated with RVO but homocysteinemia, hyperlipidemia and short axial length are distinctive amongst all.

CONCLUSIONS

This study showed that high plasma homocysteine, hyperlipidemia

and shorter axial length can be independent and distinctive risk factor or associated with each other in Retinal vein occlusion. However, larger studies are required to establish a perfect correlation.

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