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Risk Factors of Retinal Vein Occlusion in Indian Population

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PURPOSE: To evaluate risk factors associated with retinal vein occlusion in Indian population.
METHOD: A prospective observational study was conducted on 52 eyes of 52 patients who presented in OPD of Department of Ophthalmology, J.L.N. Medical College, Ajmer (Raj). Patients were investigated for risk factors of RVOs.
RESULT: RVOs were more common in males (55.77%) of 41-60 yr age group. There were 27(51.92%) cases of BRVO, 22(42.31%) cases of CRVO & 3(5.77) case of Hemiretinal vein occlusion. Among all cases, 29(55.77%) had hypertension, 18(34.62%) had hyperlipidemia, 8(15.38%) had diabetes mellitus & 5(9.62%)case had deranged RFT. Serum Homocystiene level evaluated in 5case(<40yr) out of which 3(60%) had raised serum homocystiene levels.
CONCLUSION: RVOs are more common in males. Old age and hypertension is strongly associated risk factor with RVOs, followed by hyperlipidemia > diabetes mellitus > hyperhomocystinemia > deranged RFTs.
KEY WORDS: RVOs, Hypertension,homocysteine, hyperlipidemia

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I. Introduction

Retinal vein occlusion (RVO) is the second most common retinal vascular disease after diabetic retinopathy and a major cause of vision loss. Depending on the involvement site and retinal perfusion extent, venous occlusions affecting the retina have been classified into 6 clinical entities differently:

1) Central Retinal Vein Occlusion (CRVO)
a) Non Ischemic or Venous Stasis Retinopathy
b) Ischaemic or Haemorrhagic Retinopathy

2) Branch Retinal Vein Occlusion (BRVO)
a) Major
b) Macular

3) Hemicentral Retinal Vein Occlusion (HCRVO)
a) Non Ischaemic
b) Ischaemic[3].

Among all types of RVO, BRVO is 4 to 6 times more common than CRVO . [1, 2].

The diagnosis is based on the fundoscopic finding of retinal vein dilatation in association with retinal hemorrhages and cotton-wool spots. 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.

Retinal vein occlusion is common especially in middle-aged and older individuals. Further systemic risk factors are hypertension, atherosclerosis, hyperlipidemia, diabetes mellitus, vascular cerebral stroke, thrombophilia and blood hyperviscosity. Metabolic syndrome is a strong risk factor. According to some studies males are more risk then females. Congenital thrombophilic disease like factor V Leiden mutation, hyper homocysteinemia and anti cardiolipin antibodies are also the patients with increased risk of RVO. Cigarette smoking is also a major risk factor.

Major ophthalmic risk factor for RVO are glaucoma, higher ocular perfusion pressure and changes in the retinal arteries.

The family physician has an important role in detecting and controlling risk factors for retinal vein occlusion, including hypertension, diabetes mellitus and hyper viscosity syndromes[4]

II. Material And Methods

A prospective observational study was conducted in the Department of Ophthalmology, J.L.N. Medical College, Ajmer (Raj). The patients presenting in retina clinic with RVO during the study period and fulfilling the selection criteria mentioned below were included in the study . Ethical clearance was obtained from institutional review board.

Duration- Oct. 2018 – March 2020

Inclusion criteria

1. All cooperative patients for fundus examination.
2. Age > 20 years

Exclusion criteria

1. Associated other ocular diseases that cause significant visual impairment
2. Immunocompromised patients
3. Pregnant patients.

Procedure-

Informed and written consent was taken from all patient. Patient particulars like name, age, sex, occupation and address were recorded. History of any addiction was noted. A detailed ocular history from all the patients was recorded. Detailed local examination of both the eyes were done.

This include-

- Visual acuity both uncorrected and best corrected.
- Anterior segment examination done by slit lamp.
- Pupillary reaction was noted to find the RAPD.
- Fundus examination was done by both direct and Indirect Ophthalmoscopy.
- FFA
- OCT finding
- IOP measurement.

All the patients underwent complete systemic examination and following investigations were done.

- HB, BT, CT
- BS, RFTs
- Lipid profile
- S. Homocystiene level (in young patients 20-40yr)

Hypertension :-Hypertension defined as patients with blood pressure (BP)> 140/90 mm Hg or patients taking anti – hypertensive medication or any h/o hypertension.

Diabetes Mellitus :-Diabetes mellitus defined as FBS>126mg/dl, PP > 200mg/dl or h/o DM

Hyperlipidemia :-Hyperlipidemia defined as S. cholesterol > 200 mg/dl or S. triglycerides > 180 mg/dl associated with or without HDL cholesterol < 30 – 60 mg/dl, LDL cholesterol > 100 mg/dl or having h/o hyperlipidemia.

Homocysteinemia-Serum Homocysteinemia defined as fasting Serum Homocysteine levels > 12 mmol/dl .

- Deranged RFTs defined as S. creatinine levels > 1.2 mg/dl., S. urea levels > 40 mg/dl.
- POAG was labeled in patients already on anti-glaucoma medication or IOP > 21 mmHg with optic disc changes or visual field defect.

III. Result

Systemic and Ocular risk factors are depicted in Table2. Table 3 shows the amount of visual impairment at the time of presentation.

Table-1 Prevalance of Type of RVO-

Type of RVO	Frequency	Percentage
CRVO	22	42.31%
BRVO	27	51.92%
HRVO	3	5.77%
	52	100.00

Table- 2 systemic & ocular risk factors of RVO

S.N.	Characterstic	present	percentage
1.	Hypertension	29	55.77
2.	Diabetes mellitus	8	15.38
3.	Hyperlipidemia	18	34.62

4.	Deranged RFT	5	9.62
5.	Raised IOP	4	7.69
6.	Homocysteinemia	3	60

(serum homocysteine level were evaluated in 5 patient < 40 yr age grp.)

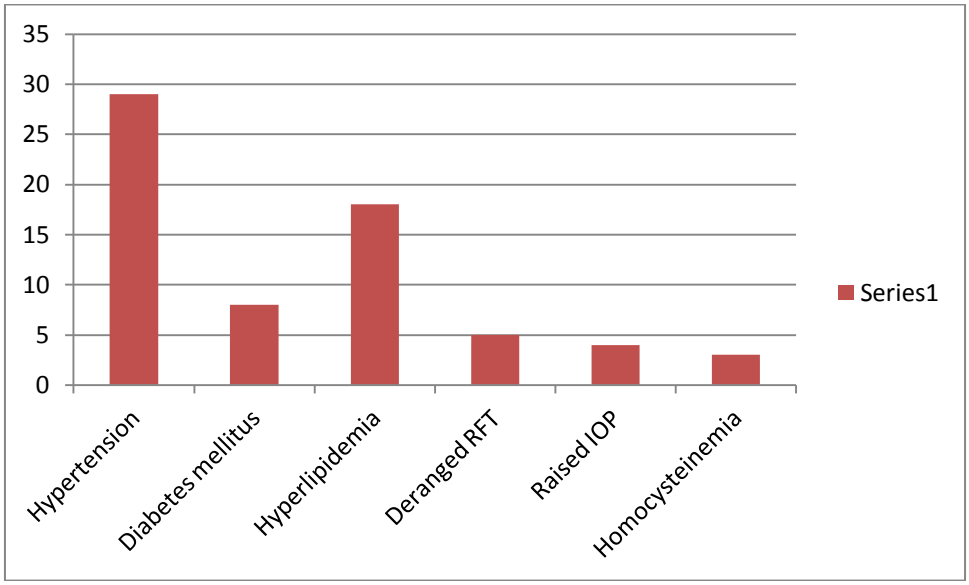

Table-3 Showing visual impairment in RVO

Category of visual impairment	Patient of RVO	Percentage
Normal (6/6-6/18)	6	11.54
Visual Impairment (<6/18-6/60)	22	42.31
Sever visual impairment (<6/60 – 3/60)	5	9.62
Blind (<3/60 to 1/60)	15	28.85
Blind (<1/60 to only pl)	4	7.69
Total	52	100.00

IV. Discussion

Our study included 52 patients of retinal vein occlusion for the assessment of risk factor associated with the disease. We found that maximum patients (65.38%) were of 41-60 Yrs age, followed by 17.31 % patients of 70 Yrs or more age. 55.77% were male and 44.23 % patients were female. Sayli Mahesh Gavaskar et al observed that majority of the patients (36.7%) were in the age group of 61- 70 year; with an average age of 65 years and there was female preponderance (60%) in the group while male patients constituted 40% of the study group. Rajini Sharma et al observed that the mean age of patients in their study was 51.8 years (range 24-72 years). Male: female ratio was 3:1.

In our study ,42.31% patients had CRVO, 51.92% had BRVO and 5.77% had HRVO. Gawasker et al (2019) did found that most of the patient (81.67%) had BRVO and 18.33% patient had CRVO. *Prajapati VA et al (2014)* did found that CRVO 23 (46%) is more common than BRVO 21 (42%),

In our study,.15.38% patients were diabetic, 55.77% patients were hypertensive, 34.62% patients were hyperlipidemic, 9.62% patients had deranged kidney function test , 11.54% patients were smoker, 3.85% patients were alcoholic and 3.85% patients were smoker and alcoholic both. 7.69% patients had increased IOP. Sayli Mahesh Gavaskar et al observed that association of duration of Hypertension, Diabetes Mellitus and Dyslipidemia with RVO was not found to be significant and nor was the association between occurrence of RVO among known and newly diagnosed cases of the above. Diastolic hypertension was found to be more significant than Systolic hypertension in causation of RVO. Neither Tobacco chewing in any form; nor its duration was found to be associated with RVO. POAG was not found to be significant in the development of BRVO. When Hyperhomocysteinemia was considered as a risk factor irrespective of age, it was not significant stastically. Hayreh (1994) also reported that only 3-5% of cases of Retinal Vein occlusion were under the age of 40 years. So increasing age is an important risk factor for RVO as supported by previous studies. Cugati et al (2006) noted increasing mean arterial blood pressure and atherosclerotic retinal vessels were significant predictors of incident Retinal vein obstruction. Arakawa et al (2011) concluded in their study that higher blood pressure is an independent risk factor for the development of Retinal Veinous Occlusion. Stem et Al (2013) confirmed in their study that hypertension and vascular diseases are important risk factors for central Retinal vein Occlusion. Therefore the findings of our study correlate well with above mentioned studies. Srestha et al

(2006) concluded that both HTN and DM are associated with RVO. However they found HTN more strongly associated with BRVO and DM more often associated with CRVO.BVN showed incidence of 8% isolated diabetes in their study. Paul et al (2008) in their study concluded that hypertension and hyperlipidemia are common risk factors for Retinal venous occlusion in adults and diabetes mellitus is less common. In Beaver Dam Eye study, higher serum creatinine levels constituted a significant risk factor for retinal veinous occlusion over 15 years follow-up.

Arakawa et al (2011) reported in there is association between chronic kidney diseases and retinal veinous obstruction independent of age, sex and diastolic blood pressure. Renal dysfunction and RVO are both closely related to Hypertension. This fact indicates simultaneous pathology in the retinal and renal vasculature caused by hypertension. In our study, we found that chornic kidney disease was present in 9.52% patients who were on treatment for hypertension.

Serum homocysteine levels were elevated in only 3 (60%) patients who were below 40 years of age. This suggests strong association between S. homocysteinemia and RVO. According to study by Narayansamy et al (2007) 51.72% of CRVO with mean age of 30 years exhibited hyperhomocysteinemia.

V. Conclusion

Following conclusion drawn from the present study-

- RVOs are more common in males.
- BRVOs are more common than CRVOs .
- Our study shows that increasing age ,systemic hypertension and hyperlipidemia are strongly associated risk factors of RVOs. However, smaller amount of risk is associated with Diabetes mellitus, chronic renal failure and raised intra-ocular pressure. Therefore, we recommend primordial prevention of these lifestyle diseases to reduce the incidence of RVOs in general population and emphasize the importance of regular IOP checkup in patients above 40 years.
- Hyperhomocystienemia is strongly associated risk factor of RVOs in patients below 40 years of age.

We conclude that systemic medical conditions associated with RVOs are hypertension, hyperlipidemia , diabetes mellitus and chronic Renal Failure. So thorough systemic evaluation has to be done in patients with RVOs.Adequate initial control of high blood pressure and cholesterol levels are essential. Regular systemic, ophthalmologic follow up important in early diagnosis of the disease as well as monitoring the progression of the disease.

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