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A Clinical Study on Ocular Vasoocclusive Disorders in A Tertiary Hospital.

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ABSTRACT:
Background: To evaluate the clinical presentation, management and visual prognosis in patients with ocular vasoocclusive disorder.
Methods: A hospital based prospective study included 267 patients with complaints of sudden or gradual vision loss, floaters, flashes, shadows and cases referred from Medicine ,Nephrology, Neurosurgery and other departments were evaluated for fundus examination during the period from October 2014 to September 2017.
Results: Among the CRAO cases (8.3%) improved,(33.3%) cases worsened (58.3%) cases remained same.Among the BRAO cases (60%) cases improved,(20%) worsened, (20%) cases remained same.In ischaemic CRVO (83%) cases did not improve, for cases of non ischaemic CRVO,the improvement in vision is seen only in (9.09%) cases.Among the CILIO RAO (6.3%) cases improved where as (58.3%) cases worsened.
Conclusion : After medical and surgical management vision improved in 75(36%)cases, while it remained constant in (34%) cases and worsened in (30%) cases.Improvement occurred in most of the non ischaemic HCRVO,BRVO, BRAO, and CILIO RAO cases and worsened mostly in ischaemic CRVO, CRAO,and in all cases of ischaemic HCRVO and remained constant in most CRAO cases.
Key words: *CRAO, CRVO, BRAO, BRVO, HCRVO.*

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I. INTRODUCTION:

Retinal vaso occlusive disorders are one of the leading causes of blindness in people over 60 years of age. An occlusion,complete or partial, permanent or temporary, may affect the arteries or veins that supply the outer retina.

The vascular occlusion can be broadly divided into 1.Retinal arterial occlusion
2.Retinal venous occlusion.

RETINAL ARTERIAL OCCLUSION

Retinal arterial occlusion is a visually disabling vascular disorder. There is usually a sudden onset of visual loss, particularly in central retinal artery occlusion (CRAO). Ocular stroke is commonly caused by embolism of the retinal artery,although emboli may travel to distal branches , causing loss of only a section of the visual field. Retinal artery occlusion represents an ophthalmic emergency and delay in treatment may result in permanent loss of vision.Immediate intervention improves chances of visual recovery, but even then prognosis is poor with only 11-16% of eyes retain useful vision. Although restoration of vision is of immediate concern ,retinal artery occlusion is a harbinger for other systemic diseases that must be evaluated immediatedly.

TYPES:
1.CENTRAL RETINAL ARTERIAL OCCLUSION(CRAO).
2.BRANCH RETINAL ARTERIAL OCCLUSION (BRAO).
3.CILIO RETINAL ARTERIAL OCCLUSION.

RETINAL ARTERY OCCLUSION.

Blood supply to the retina originates from the ophthalmic artery, the first intracranial branch of the internal carotid artery that supplies the eye via the central retinal and the ciliary arteries.The central retinal artery supplies the retina as it branches into smaller segments upon leaving the optic disc.A cilio retinal artery occurs in approximately 14% of the population.

Typical fundoscopic finding of a pale retina with a cherry red macula (i.e. the cherry red spot) result from obstruction of blood flow to the retina from the retinal artery , causing pallor and continued supply of blood to the choroid from the ciliary artery,resulting in a bright red coloration at the thinnest part of the retina (i.e. macula).In those with a cilioretinal artery supplying the macula ,a cherry red spot is not observed.

Branch retinal artery occlusion (BRAO) occurs when the embolus lodges in a more distal branch of the retinal artery.BRAO typically involves the temporal retinal vessels and usually does not require ocular therapy unless perifoveal vessels are threatened.

The central retinal artery is affected in 57% of occlusions, the branch retinal artery in 38%, and cilio retinal artery in 5% of occlusions.

CLINICAL FINDINGS:

.An afferent pupillary defect may be observed within seconds of the occlusive events.

.The cherry red spot and a ground glass retina are the classic findings but may take hours to develop.

.Emboli can be observed in approximately 20% of patients with CRAO.

.Box car segmentation of the blood column is observed most often in BRAO and is a sign of severe occlusion and slowing of circulation.

RETINAL VENOUS OCCLUSION.

Retinal venous occlusion (RVO) is a common vascular disorder of the retina and is one of the common causes of blindness after diabetic retinopathy.

TYPES:

1.CENTRAL RETINAL VEIN OCCLUSION(CRVO)

2.BRANCH RETINAL VEIN OCCLUSION(BRVO)

3.HEMIRETINAL VEIN OCCLUSION(HRVO)

RVO is commonly subdivided into non ischaemic and ischaemic types.Such a distinction is clinically relevant ,since two thirds of patients with ischaemic type develop the dreaded comlications of macular oedema ,macular ischaemia, and neovascularisation that lead to blindness.The nonischaemic type of CRVO is thought to be milder clinical entity seventyfive to eighty percent of patients present with this form. In both types ,blockage of the retinal vein occurs, but the nonischaemic type is able to maintain better relative blood flow to the retina through collaterals, preventing the dreaded complications known of the ischaemic type.

CAUSES:

Local diseases like trauma,glaucoma (patients with history of glaucoma are 5 times more likely to have CRVO) and orbital structural lesions.Rarely, local ocular disease is seen in BRVO.When it is apparent ,one can consider Toxoplasmosis ,Behcet Syndrome, Ocular Sarcoidosis and Macroaneurysms.

Systemic disease processes include the following: Hypertension,Atherosclerosis, Diabetes, Glaucoma,Elderly person,Fasting, Hypercholesterolemia ,SLE,Sarcoidosis, Tuberculosis, Syphilis, Protein C and S deficiency,Antiphospholipid antibody disease, Multiple myeloma, Cryoglobulinemia, Leukaemia, Lymphoma, Polycythemia vera and Sickle cell disease.

The prevalence of various risk factors of vaso occlusive disorders of retina is increasing day by day and hence the chances of vaso occlusion.So this study aims at understanding the age and sex distribution,various types ,visual loss,laterality, refractive status, risk factors, incidence, visual outcome and complications of vaso occlusive disorders of eye.

II. MATERIAL AND METHODS:

STUDY DESIGN

This study is observational,Prospective cohort study.

METHODOLOGY

Patients attending the eye OPD , Department of Ophthalmology,RIO,SCB M edical college and hospital Cuttack,Odisha with complaints of sudden or gradual vision loss , floaters ,flashes, shadows,and referred cases from Medicine, Nephrology, Neurosurgery,and other departments were evaluated for fundus examination during the period from October 2013 –September2015. Out of 267 patients, 57patients were lost to follow up. 210 patients having soft exudates ,hard exudates, optic disc changes ,macular changes were taken for the study and follow up for 6 months and results were tabulated. Those patients who did not turn up for follow up were not taken for study.

Patients underwent clinical evaluation at presentation as follows

-Best corrected visual acquity.

- Intra ocular pressure

-Pupilllary reaction.

-Examination with slit lamp.

-Direct ophthalmoscopy.

-Indirect Ophthalmoscopy with and without scleral depression.
-Examination with Goldmann 3 mirror lens.
-Examination with +90D lens.
-Fundus camera observation.
-FFA.
-SD-OCT
Patients will be followed up at regular intervals for 6 months with above procedure.
EXCLUSION CRITERIA.
1.Morbid patients.
2.Patients lost to follow up during 6 months period.
3.Participants not willing to give consent for examination.
After recording the VA by Snellens chart ,pupillary reaction is noted and a detailed anterior segment examination is done by slit lamp and gonioscopy done by Goldmann 3 mirror lens ,Iris and angle neovascularisation is noted. Then IOP is recorded.After that the patient is sent for mydriatic cycloplegic dilatation for posterior segment examination.
POSTERIOR SEGMENT EXAMINATION.-
Pupil of all the patient were dilated using mydriatic 0.8% tropicamide and 5% phenylephrine drop,one drop of each in both eyes .After complete dilatation fundi of all the patients were examined using ,
Direct ophthalmoscope to have a generalised view of the fundus.
Indirect ophthalmoscope.
Goldmann 3-mirror lens.
+90D lens.
Fundus camera is used for FFA and taking photographs for future reference.
Documentation of retinal findings
Detailed sketches of the fundus are made on durable drawing paper to document the retinal pathologic condition.
CLINICAL STUDY OF RETINAL VASO OCCLUSIONS PROFORMA
CASE NO DATE
REGD NO
NAME AGE SEX M/F OCCUPATION
ADDRESS
CHIEF COMPLAINTS
H/O visual loss sudden gradual ,mild /moderate
/severe,progressive/nonprogressive,painful/painless,total/central/sectorial.
H/O transient visual loss ,headache,
H/O pain, redness, discharge,watering, trauma, coloured haloes.
H/O comorbidity, DM,HTN,VHD/IHD,BLOOD DYSCRASIAS,GLAUCOMA,and others.
PERSONAL HISTORY diet,sleep ,exercise,alcohol,smoking tobacco.
GENERAL EXAMINATION –
Build,examination of CVS,Respiratory system, CNS,Abdominal examination
OCULAR EXAMINATION Refraction
INVESTIGATION CBC, Urine RE and ME
FUNDUS PHOTOGRAPH
FFA
DIAGNOSIS
OBSERVATION:
PERCENTAGE INCIDENCE OF OCULAR VASO OCLUSIVE DISORDERS
Total no of patients who attended OPD during study period = 1,83,199

Study period	Total no. of OPD cases	Total no. of cases studied	%
Oct 2013—Sep 2014	91,473	98	0.107
Oct 2014—Sep2015	91,726	112	0.122

TABLE -1

DISTRIBUTION OF CASES AS PER MAJOR TYPES OF CCCLUSION

TYPE OF OCCLUSION	NO. OF CASES	%
CRVO	51	24
BRVO	69	32
HCRVO	15	7
CRAO	36	17
BRAO	30	14
CILIO RAO	9	4

TOTAL NO. OF CASES =	210	

Our study shows that retinal venous occlusion is more common than arterial occlusion and BRVO is the commonest type followed by CRVO and HRVO

TABLE –2
DISTRIBUTION OF CASES ACCORDING TO AGE:

AGE IN YRS	0 -- 20		21--40		41—60		>60	
TYPE	CASES	%	CASES	%	CASES	%	CASES	%
CRVO	3	5.8	6	11.8	21	41.2	21	41.2
BRVO	0	0	3	4.3	24	34.8	42	60.9
HCRVO	0	0	0	0	12	80	3	20
CRAO	0	0	12	33.3	3	8.3	21	58.3
BRAO	0	0	6	20	6	20	18	60
CILIORAO	0	0	3	33.3	0	0	6	66.6

TABLE -3
SEX INCIDENCE OF VASO OCLUSION:

NO OF MALES	%	NO OF FEMALES	%
120	57	90	43
TOTAL	NO OF CASES 210		

TABLE -4

NO OF PATIENTS IN URBAN AREA	%	NO OF PATIENTS IN RURAL AREA	%
175	83.33	35	16.67

TABLE-5
DISTRIBUTION OF CASES BY SOCIOECONOMIC STATUS

Socioeconomic status	No of patients	%
Lower	17	8.09
Middle	48	22.85
Higher	145	69.04

TABLE—6
DISTRIBUTION OF CASES BY OCCUPATION

	No of patients	%
Farmers	11	5.23
Labourers	9	4.28
Students	3	1.42
IT professionals	36	17.14
Industrialists	48	22.85
Retired persons	91	43.34
Others	12	5.17

TABLE—7
SEX INCIDENCE IN DIFFERENT TYPES OF RETINAL VASO OCCLUSION

TYPES OF OCCLUSION	MALE CASES	%	FEMALE CASES	%
CRVO	30	58.8	21	41.2
BRVO	33	47.8	36	52.2
HCRVO	12	80	3	20
CRAO	24	66.6	12	33.3
BRAO	18	60	12	40
CILIO RAO	6	66.6	3	33.3

TABLE—8
DISTRIBUTION OF CASES ACCORDING TO LATERALITY

TYPE OF OCCLUSION	RIGHT EYE NO OF CASES	%	LEFT EYE NO OF CASES	%
CRVO	30	58.8	21	42.2
BRVO	42	60.9	27	39.1
HCRVO	6	40	9	60
CRAO	24	66.6	12	33.3
BRAO	18	60	12	40

CILIO RAO	6	66.6	3	33.3

TABLE—9
RISK FACTORS ASSOCIATED WITH RETINAL VASO OCCLUSION

TYPE OF OCCLUSION	HYPERTENSION NO %	DM NO %	DM+HYPERTENSION NO %	SMOKING N0 %	IHD/VALVULARHEART DISEASE No %	OTHERS (UNDETERMINED) NO %
CRVO	21 47.1	6 11.8	12 23.5	3 5.8	3 5.8	6 11.8
BRVO	45 65.2	9 13	15 21.7	3 4.3	3 4.6	0 0
HCRVO	6 40	0 0	0 0	0 0	0 0	3 20
CRAO	27 75	12 33.3	24 66.6	18 33.3	12 33.3	6 16.6
BRAO	18 60	6 20	6 20	12 20	6 20	0 0
CILIO RAO	6 66.6	3 33.3	0 0	6 0	0 0	0 0

TABLE—10
INCIDENCE OF ISCHEMIC VS NONISCHEMIC CRVO

SUB TYPE OF CRVO	NO OF CASES	%
ISCHEMIC CRVO	18	35.3
NONISCHEMIC CRVO	33	64.7

TABLE—11
INCIDENCE OF DIFFERENT OCULAR NEOVASCULARIZATION

TYPE OF OCCLUSION	NVD CASES %	NVE CASES %	NVI CASES %
CRVO ISCHIMIC	3 16.6	3 16.6	12 16.6
NONISCHIMIC	0 0	0 0	0 0
BRVO	9 13	15 21.7	0 0
HCRVO	0 0	0 0	0 0
CRAO	6 16.6	6 16.6	9 25
BRAO	0 0	0 0	0 0
CILIO RAO	0 0	0 0	0 0

TABLE 12
COMPLICATIONS DEVELOPED DURING FOLLOW UP IN DIFFERENT TYPES OF OCCLUSION

TYPE OF OCCLUSION	NO COMPLICATION NO %	NEOVASCULARIZATION NO %	VITREOUS HAEMORRHAGE NO %	MACULAR OEDEMA NO %	OPTIC ATROPHY NO %
CRVO					
ISCHEMIC	18 35.2	18 100	3 16.6	3 16.6	6 23.3
NONISCHEMIC	18 54.5	3 9.09	3 9.09	12 36.3	0 0
HCRVO	12 80	0 0	0 0	3 20	0 0
BRVO	9 13.04	24 34.7	18 26	3 43.3	0 0
CRAO	0 0	21 58.3	6 16.6	6 16.6	9 25
BRAO	24 80	0 0	0 0	4 20	0 0
CILIO RAO	9 100	0 0	0 0	0 0	0 0

TABLE—13
COMPARISION OF VISUAL ACUITY AT PRESENTATION IN DIFFERENT TYPES OF RETINAL VASO OCCLUSION

TYPE OF OCCLUSION	6/6-----6/12 NO %	VISION AT 6/18----6/36 NO %	PRESENTATION 6/60 NO %	CF NO %	HM NO %	PL NO %
CRVO	3	24 47	15 23.5	3 5.8	0 0	0 0
ISCHEMIC	5.8	0 0	15 83.3	3 16.6	0 0	0 0
NONISCHEMIC	0 0	24 72.7	6 18.18	0 0	0 0	0 0
	3 9.09					
HCRVO	0 0	9 60	6 40	0 0	0 0	0 0
ISCHEMIC	0 0	0 0	6 40	0 0	0 0	0 0
NONISCHEMIC	0 0	9 60	0 0	0 0	0 0	0 0
BRVO	6 8.8	42 60.8	15 21.7	6 8.69	0 0	0 0
CRAO	0 0	3 8.3	6 16.6	9 24.9	12 33.3	6 16.6
BRAO	3 10	6 20	6 20	12 40	3 10	0 0

CILIO RAO	0	0	0	0	6	66.6	3	33.3	0	0	0	0

TABLE -14
VISUAL OUTCOME FOR DIFFERENT VASO OCCLUSIONS

TYPE OF OCCLUSION	VISION AT REMAINS CONSTANT		FINAL VISIT IMPROVES		WORSE	
	NO	%	NO	%	NO	%
ISCHEMIC CRVO	9	50	3	16.6	6	33.3
NON ISCHEMIC CRVO	15	45.45	3	9.09	15	45.45
ISCH HCRVO	0	0	0	0	6	100
NONISCH HCRVO	3	33.3	6	66.6	0	0
BRVO	18	26	36	52	15	21.7
CRAO	21	58.3	3	8.3	12	33.3
BRAO	6	20	18	60	6	20
CILIO RAO	0	0	6	66.6	3	33.3

III. DISCUSSION:

The present study is an attempt to evaluate certain important clinical parameters observed among patients, presenting with retinal vaso occlusion.

A comparative study of various clinical parameters was carried between the important types of retinal vaso occlusion. Total number of patients who attended OPD during our study period from October2013--2015 with percentage of incidence being 0.107 after studying 98 cases and 0.122 after studying 112 cases.Among 210 cases studied venous occlusion was 135(64%)[1, 2], arterial occlusion 75 (35.8%), so venous occlusion is more common than arterial. Majority of cases were found to be in higher economic status with 145 (69.04%) cases, followed by middle status of 48(22.85%) cases and 17 (8.09%) cases of lower status. The sex incidence was more in males 120(57%) as compared to 90 (43%) of females[3]. In the age group >60 years, majority were females 60(54%) as compared to 51(46%) of males. Vaso occlusion in all age groups were common in males than in female except in >60 years of age group. This distribution is in part due to the large number of women at risk in an elderly population[4,.] Our study shows hypertension is the commonest and single most risk factor followed by hypertensive diabetic and then diabetic alone for venous occlusion. For arterial occlusion, hypertension is the commonest risk factor followed by smoking and hypertensive diabetic. Hypertension remains the most important risk factor for any vascular occlusion. The possible explanation is that in elderly persons, hypertension is a relative common disease which causes sclerotic changes in the central retinal artery and its branches, thereby compressing adjacent veins which then helps in precipitating an occlusion[5].

This study shows that ischemic CRVO is less common as compared to non-ischemic CRVO[6]. However it is important to follow-up all cases of non-ischemic CRVO for a period of at least 3 years during which some of them may undergo an ischemic change and thus become more susceptible to the development of ocular neovascularisation. There is a high incidence of NVI as compared to NVD and NVE in cases of CRAO. Further NVE was commoner than NVD in patients with CRVO. Out study shows that among cases with ischemic CRVO, NVD and NVE was seen in 33.3 cases each[7]. This variable incidence is explained by the fact that the anterior segment is the commonest site for neo-vascularisation to develop and this can develop any time during the first seven months. However, neo-vascularisation at a later date may occur and also it is known that cases initially classified as non-ischemic may convert to ischemic type by 18-36 months after the occlusive episode and may then be followed by ocular and anterior segment neo-vascularisation. Retinal neo-vascularisation may develop, if area of capillary non-perfusion is more than 5DD on FFA.

In our study, at 6 months follow-up, we found that 18(35.2%) cases of CRVO did not have any complication. Majority 18(35.2%) cases developed neo-vascularisation, 15(29.4%) cases has vitreous haemorrhage and macular oedema respectively, 6(11.7%) cases developed optic atrophy. Among the ischemic CRVO cases, all had complications. 18(100%) cases developed neo-vascularisation, 12(66.6%) had vitreous haemorrhage, 3(16.6%) cases developed macular oedema and 6(33.3%) cases had optic atrophy. Among the non-ischemic cases, 18(54.5%) cases did not have any complications. 3 (9.09%)cases developed neo-vascularisation, 3(9.09%) cases had vitreous haemorrhage and 12 (36.3%) cases developed macular oedema. Among the CRAO cases, all had some complications. 21 (58.3%) cases developed neo-vascularisation, 6(16.6%) cases had macular oedema and 9(25.00%). We found that most common complication of occlusion was neo-vascularisation and macular oedema was more common in BRVO as compared with CRVO. Among CRVO, macular oedema was more in non-ischemic variety (36.3%) as compared to (16.6%) in ischemic variety. Vetrious haemorrhage was found more in ischemic CRVO cases and this can be explained by the fact that neovascularisation is more in ischemic variety thereby increasing risk of vitreous haemorrahage.The most common presenting VA in nonischemic CRVOcases was between 6/12 –6/18 in 24 (47%) cases followed by 6/60 visual acuity in 15 (23.5%) cases, ischemic CRVO presented with mainly 6/60 or worse vision. Among

CRAO cases, 3(8.3%) cases presented with vision varying from 6/18 to 6/36 ,while 6(16.3%) cases with 6/60 ,9(24.9%) with CF vision ,12(33.2%) cases with HM and 6(16.6%) cases with PL vision.Among BRAO cases,6 (20%) cases presented with vision varying from 6/18—6/36 , while 6(20%) cases with 6/60,12(40%) cases with CF vision, 3(10%) cases with HM and 3(10%) cases with 6/6—6/12 vision.

In our study we found that the non ischemic cases of CRVO and HCRVO presented mainly with vision 6/6—6/36 while ischemiccases presented mainly with vision less than 6/60.

Various studies reveal that Non ischaemic CRVO may be asymptomatic in mild cases and is detected only when macular oedema makes it symptomatic , while Ischaemic CRVO is associated always with central vision due to macular involvement [8].

Visual acuity in CRAO is poor at presentation and the prognosis is generally poor with a few exceptions.The presenting VA is usually worse than CF, whereas in BRAO cases the presentation was with 6/60 or better.

We followed up to 6 months and found that the vision among ischaemic CRVO cases improved in 3(16.6%) cases , worsened in 6(33.3%) , remained same in 9(50%) cases .Among non ischaemicCRVO improved in 3(9.09%),worsened and remained same in 15 (45.5%).Among ischaemic HCRVO 6(100%) cases worsened and 6(66.6%) cases in non ischaemic HCRVO improved whereas no cases worsened

Among the CRAO 3(8.3%) cases improved ,12(33.3%) cases worsened and 21(58.3%) cases remained same.In BRAO 18(60%) cases improved where as worsened and remained in 6(20%) cases. Among CILIO RAO cases 6(8.3%) improved, 3 (58.3%) cases worsened. So for non ischaemic CRVO ,complete recovery with good visual outcome occurs only in about 10% cases. Fifty percent of patients have worsening of vision. About one third of patients convert to ischaemic CRVO ,more than 90% of cases will have 20/200 or worse vision.About 60% of patients develop ocular neovascularisation with associated complication.[9, 10] In CRAO cases around 83% cases did not improve.Among BRAO 60% cases showed improvement .where as 20% cases worsened[11].

Literature reveals recovery from branch retinal artey obstruction is usually very good without treatment , 60% -70% of patients improve to a visual acuity of 20/40 or better. However, some degree of visual field deficit usually persists.

IV. CONCLUSION

Retinal vasooclusive diorders are one of the leading cause of blindness in people over 60 years of age. An occlusion complete or partial, permanent or temporary may affect the arteries or veins that supply the outer retina. The present study on observation of vaso occlusive disorders of eye leads to the following conclusion.

A good clinical examination can do longway in providing information regarding the status of a vascular occlusion thereby paving way for further investigation and possible treatment in those categorised as high risk,i.e. ischemic cases.

Hypertention is the the single most important risk factor followed by diabetes and smoking for any type of occlusion. A marked afferent pupillary defect is indicative of ischemic vaso occlusion and thus those cases should be investigated accordingly. Neo vascularisation of iris is fairly common in ischemic vaso occlusion and should be searched meticulously in those cases and PRP given to prevent neo vascular glaucoma, a potential blinding condition. BRVO are the most common and fortunately the safest vascular occlusion as they are associated with mild to moderate visual loss and are practically not known to cause neo vascular glaucoma which may occur in other ischemic varieties. The final visual outcome is good in hemi retinal and branch retinal vein, artery occlusion where as worst in central retinal artery and ischemic central retinal vein occlusions.

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