



ETIOLOGY OF NEOVASCULAR GLAUCOMA

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ABSTRACT

Purpose : To study the etiology of Neovascular Glaucoma in a tertiary eye care hospital.

Materials and methods: This is a Prospective Observational study conducted on 50 patients of Neovascular Glaucoma presenting at a tertiary eye care hospital during a period of one year. All patients who were proved to have NVG were included in study. Patients having corneal opacities and severe edema and those who didn't give consent were excluded from the study. Informed consent obtained from all the patients included in study. Detail history about systemic disorders and ocular pathologies was taken. All patients were examined by an experienced Ophthalmologist using slit lamp, Snellen's chart, Gonioscope, Applanation Tonometer, Indirect Ophthalmoscope, 90D slit lamp Funduscopy . FFA and Posterior segment OCT was done in selected cases.

Results: Of 50 cases 16(33%) were females and 34(67%) were males. 2 (4%) patients both eyes were involved. LE was involved in 24(48%) and RE in 24(48%) patients. Mean age of Presentation was 54.11 years with SD of (14.023). Minimum age of presentation was 4 years and maximum was 85 years. Among 50 patients 8(16%) had Diabetes mellitus, 13(26%) had Hypertension, 9(18%) had both DM and HTN. 20 patients had ocular disease as cause of NVG. 5(10%) had Uveitis, 11 (22%) had PACG, 3(6%) had trauma, 3(6%) had Retinal detachment, 1(2%) had Retinoblastoma. BCVA at the time of presentation was between 6/18- No PL.

Discussion: The most common cause of NVG in Present study is Retinal venous occlusion 16(32%) followed by PACG 12(24%), PDR 10(20%), Uveitis 5(10%), RD 3(6%) Trauma 3 (6%). Whereas in studies done in USA, China, South Korea PDR is leading cause of NVG followed by Retinal venous Occlusion. No data was available regarding PACG.

Conclusion: In Indian population Retinal venous occlusion is the most common cause for NVG followed by PACG, Proliferative Diabetic retinopathy is third common cause. Uveitis, Retinal detachment surgery, Trauma and Retinoblastoma are ocular pathologies responsible for NVG.

KEYWORDS : NVG(Neo vascular glaucoma), PACG (Primary angle closure glaucoma), PDR proliferative diabetic retinopathy

INTRODUCTION:

Neovascularization of Iris is known as Rubeosis Iridis since 1928, is a major pathological condition for the development of Neo vascular glaucoma¹. The Visual Acuity of large number of eyes had dropped drastically due to its complications. Therefore, presently this entity deserves more attention.

Neo vascular Glaucoma is always secondary to ocular and or systemic conditions disorders². Many eyes were enucleated in the past as large number of them have become absolutely blind and painful. With the present advances in the management, the globe may be preserved and to some extent vision can be saved. The purpose of this study is to know various etiologies that leads to NVG. Most of them if diagnosed and treated promptly can reduce the incidence of NVG.

MATERIALS AND METHODS:

This is a Prospective Observational study conducted on 50 patients of Neo vascular Glaucoma presenting at a tertiary eye care hospital during a period of one year. All patients who were proved to have NVG were included in study. Patients having corneal opacities and severe edema and those who didn't give consent were excluded from the study. Informed

consent obtained from all the patients included in study. Detail history about systemic disorders and ocular pathologies was taken. All patients were examined by an experienced Ophthalmologist using slit lamp, Snellen's chart, Gonioscope, Applanation Tonometer, Indirect Ophthalmoscope, 90D slit lamp Funduscopy. FFA and Posterior segment OCT was done in selected cases.

RESULTS :

Of 50 cases 16(33%) were females and 34(67%) were males. 2 (4%) patients both eyes were involved. LE was involved in 24(48%) and RE in 24(48%) patients. Mean age of Presentation was 54.11 years with SD of (14.023). Minimum age of presentation was 4 years and maximum was 85 years. Among 50 patients 8(16%) had Diabetes mellitus, 13(26%) had Hypertension, 9(18%) had both DM and HTN. 20 patients had ocular disease as cause of NVG. 5(10%) had Uveitis, 11 (22%) had PACG, 3(6%) had trauma, 3(6%) had Retinal detachment, 1(2%) had Retinoblastoma. BCVA at the time of presentation was 6/18- No PL.

When clinical characteristics of eyes with neovascularization of iris associated with Retinal Vein Occlusion, Angle closure Glaucoma and Diabetic Retinopathy are compared, The age

at the time of diagnosis was lower in Proliferative diabetic retinopathy (53.50) and Primary angle closure glaucoma (53.45), when compared to Retinal venous occlusions (58.08). The IOP in eyes with Proliferative diabetic retinopathy (37.17) is higher when compared to Retinal venous occlusion (33.12) and Angle closure glaucoma (33.15).

Table 1. showing various causes of NVG

Most probable etiology	Frequency	Percentage
Retinal Vein Obstruction	16	32.0
Angle Closure Glaucoma	12	24.0
Diabetic retinopathy	10	20.0
Uveitis	5	10.0
Retinal Detachment	3	6.0
Trauma	3	6.0
Retinoblastoma	1	2.0
Total	50	100.0

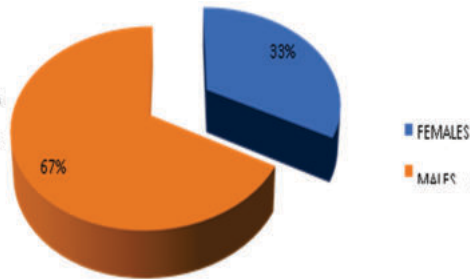


Fig.1 Pie diagram showing sex incidence

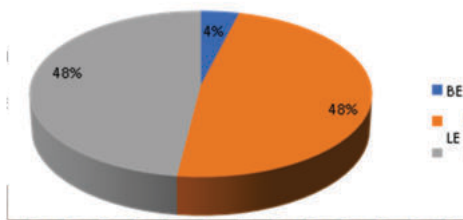


Fig. 2 Pie diagram showing involvement of eye

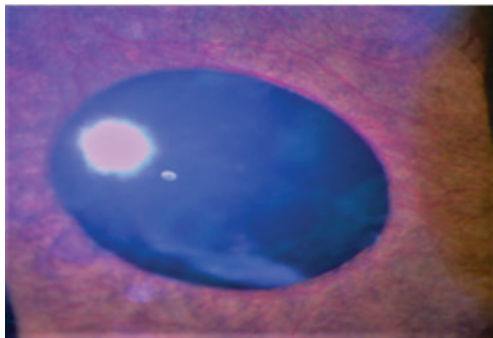


Fig. 3 Showing Rubiosis

DISCUSSION:

The most common cause of NVG in Present study is Retinal venous occlusion 12(24%) followed by PACG 11(22%), PDR 7(14%), Uveitis 5(10%), RD 3(6%). Whereas in studies done in USA, Saudi Arabia, China, South Korea PDR is leading cause of NVG followed by Retinal venous Occlusion^{3,4,5,6,7}. No data was available regarding PACG.

Table 2. Showing comparative Percentage of etiological factors of NVG in Various studies

AUTHOR (year)	Hoskins ¹ 974 ³	Brown ¹⁹ 84 ⁴	Al-Shamsi ⁵ 2016 ⁵	Leao ⁶ 2016 ⁶	Jeong ² 016 ⁷	Present study ²⁰ 18
Region of study	US	US	SAUDI	CHINA	KOREA	INDIA

Number of patients	100	208	337	310	533	50
Diabetic retinopathy	44%	42.5%	56.1%	44.7%	63.2%	20%
Retinal vein occlusion	36%	36.1%	26.4%	25.9%	23.9%	32%
Angle closure glaucoma*	Not available	Not available	Not available	Not available	Not available	24%
Uveitis	11%	6.5%	2.9%	1.9%	2.8%	10%
Retinal detachment	3%	7.5%	3.6%	4.5%	3.2%	6%
Trauma	3%	3.4%	8.0%	19.0%	3.9%	6%
Retinoblastoma	3%	4%	3%	4%	3%	2%
Total	100%	100%	100%	100%	100%	100%

Table 3 Showing mean age and gender comparison in various studies

	Brown GC ³	Jeong ⁴	Al-shamsi ⁵	Liao N ⁶	Jeong ⁷	Present study
Mean age (years)	61.5	57.9	NA	64.2	64.2	54.11
Males	96 (46.2%)	374 (70.2%)	190 (56.33%)	85 (61.6%)	85 (61.6%)	34 (67%)
Females	42 (58%)	2(8%)	159 (29.8%)	147 (43.62%)	53 (38.4%)	16(33%)

CONCLUSION:

In Indian population Retinal venous occlusion is the most common cause for NVG followed by PACG, Proliferative Diabetic retinopathy is third common cause. Uveitis, Retinal detachment surgery, Trauma and Retinoblastoma are ocular pathologies responsible for NVG.

Neo vascular glaucoma can be avoided by meticulous control of Diabetes mellitus, Hypertension, early detection and management of Proliferative diabetic retinopathy and Primary angle closure glaucoma.

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Conflict of interest: None

Institutional ethics committee approval obtained

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