

RESEARCH ARTICLE

PREVALENCE OF GLAUCOMA IN NORTH COSTAL ANDHRA PRADESH

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Manuscript Info

Abstract

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*Key words:-*PACD. Primary Angle closure Disease, POAG: Primary Angle Closure Glaucoma Aim: To study the prevalence of Glaucoma and its sub types in North costal Andhra Pradesh in South India. Results: Among the total number of 2,98,971 General ophthalmic OPD individuals, 4836 individuals referred to Glaucoma clinic on

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suspicion of glaucoma and 4320 patients are confirmed to have glaucoma after doing relevant investigations. 1884 primary open angle glaucoma (POAG), 1057 Primary Angle closure disease (PACD), 702 glaucoma suspect or at risk, 82 Juvenile Open angle glaucoma, 43 Normal Tension Glaucoma, 41 Ocular hypertension, 489 Secondary glaucoma, 22 congenital & Developmental Glaucoma are identified. **Conclusion:** This study revealed the prevalence of various subtypes of glaucoma which varies ethnic wise. The prevalence of POAG is more

(43.6%), followed by PACG (24.5%), secondary glaucoma (11.3%), Juvenile Open angle glaucoma (1.9%), Normal Tension Glaucoma (1%), ocular hypertension (0.9%), congenital glaucoma (0.5%)

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Introduction:-

Glaucoma is a group of diseases with optic neuropathy associated with characteristic structural changes at the optic nerve head that may lead to visual field loss and, ultimately leads to blindness if untreated. The prevalence of glaucoma varies from the West to the East. The incidence of glaucoma varies geographically (1) depending on ethnicity, race(2) and urban to rural area so also variations in the blindnesspercenetage due to glaucoma (3). The glaucoma also varies with social background. (4)

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Many risk factors are identified including the structural and genetic susceptibility are identified (5). Age is the prime risk factor for glaucoma. The life expectancy is raising across the world and the number of centenarians are also increasing which is another factor for increase the incidence of glaucoma. The global burden of glaucoma is on the rise (6). There is a need to know the ethnic variations in the incidence of glaucoma to identify the risk factors in the geographical area and to establish aetiology and to plan certain preventive measures to control the glaucoma.

Materials & Methods:-

A retrospective study, conducted from a Tertiary eye Hospital Visakhapatnam in North costal Andhra Pradesh.

A total number of 2,98,971 general ophthalmic Out patients from September 2016 to December 2019 are evaluated

Corresponding Author:- Dr. K.V.V Satyanarayana MD. Address:-Associate Professor Gitam Institute of Medical Sciences. Visakhapatnam. who attended Govt. Regional Eye Hospital Visakhapatnam, a tertiary care, teaching Eye hospital (Table .1) where 56.38% of geographical area is tribal area, where there is quality of specialist services are lacking. Thus to provide an epidemiological statistics and useful glaucoma survey in this region to plan the remdial treatment plans.

All cases are evaluated with Glaucoma investigations. BCVA is recorded, Anterior segment examination done with biomicroscopy, anterior chamber depth analysed by von Herrick's method, gonioscopy examination done with 2mirror and 4 mirror gonioscope to evaluate the angle configuration. Anterior chamber angle grading done by Shaffer's method. Indentation gonioscopy done for all occludable angles. Intraocular pressure recorded with Goldman applanation tonometer. Intraocular pressure (IOP) of more than 22 mmHg on two or more separate occasions and considered as raised IOP. Normal Tension glaucoma, Ocular Hypertension and POAG are divided basing on the amount of IOP. In paediatric glaucoma anterior chamber Angle examined with direct gonioscope, and IOP recorded with Perkins tonometer under short General Anaesthesia. Central corneal thickness calculated with Zeiss OCT machine. Optic nerve head evaluation done with +78 d lens after dilatation of the pupil to assess CD ratio and RNFL defects. High CD ratio > 0.6, focal notching of the disc, deep cups, thinning of the neuro retinal rim, CD asymmetry among two eyes, are the criteria taken for confirmation of POAG. Visual field are recorded on Humphry visual field Analyser. OCT RNFL and Macular programs done in selective cases with Zeiss OCT machine. They are divided into various subtypes of Glaucoma. Glaucoma suspects or at risk patients are kept in a separate group with CD ratio around 0.5 and CDR disparity more than 2 without having any visual field changes. These cases are followed for any progression in to POAG. Primary Angle Closure glaucoma with the following criteria of shallow anterior chamber, , sphincteric atrophy. iris atrophy and gonioscopy. PACG patients are divided into narrow, closed, occludable angles. Anterior chamber angle evaluated for Peripheral anterior synechia. All these cases are further classified in to Primary angle closed suspect, Primary Angle Closure with or without ocular hypertension and Primary Angle Closure Glaucoma. They are also divided into acute, intermittent and Chronic Angle Closure Glaucoma symptomatic wise. Any patient with previous history of eye diseases like uveitis, ocular trauma and intake of steroids for reasonable period are considered to count as Secondary glaucoma. Juvenile Open Angle Glaucoma or early onset open angle glaucoma are the cases having positive investigative reports around the age of 35 years. Congenital glaucoma cases have presented with high IOP, with corneal enlargement with variable symptoms.

Results:-

The general ophthalmic out patient senses during the 3 years and 4 months are 2,98,971, out of them 4836 patients are referred to Glaucoma services on glaucoma suspicion. 4320 (1.44%) individuals are confirmed to have Glaucoma after subjecting them for relevant investigations. 1,32,923 patients are between the ages of 30 - 60 years and 3104 (2.38%) found to have glaucoma. (Table. 2)

The following sub types of glaucoma are noted as follows:

1. Primary open angle glaucoma: The diagnosis is confirm after evaluation with the raised IOP more than 21 mm of Hg, CD ratio more than 0.6, with neuroretinal rim thinning, polar notch, RNFL defects, visual field changes. 1884 cases are confirmed to have POAG (43.6%) out of 4320 glaucoma cases. (Table .3). POAG is the most common glaucoma among the other subtypes in our study. (Table .3)

2.Primary angle closure glaucoma: Second common sub type of the Glaucoma series in this study. Out of 4320 glaucoma cases. 1057 (24.5%) are PACG. PACG cases are classified as per International Society Geographical & Epidemiological Ophthalmology (ISGEO) after relevant examination methods (7)

3. Glaucoma suspect group consists individuals with CD ratio around 0.6 RNFL defects, with normal visual fields and normal IOP at the time of visit. These cases are advised for follow-up.702(16.3%) Glaucoma suspect sub type cases are identified out of 4320 total glaucoma cases.

4. Secondary Glaucoma: These are the cases with raised IOP, secondary to ocular causes with any history of ocular diseases, trauma, steroid intake. 489 (11.3%) Secondary Glaucoma cases are identified under this category. 5. Juvenile onset open angle glaucoma : Patients less than 40 years of age with clinical findings similar to POAG were considered as Juvenile Open Angle Glaucoma (JOAG). 82 (1.9%) cases are identified. The diagnosis is confirmed after the relevant investigations.

6.Normal Tension Glaucoma: Those with normal intraocular pressure, open angles, but with the signs of increased CD ratio, visual field changes, 43 (1%) cases are documented . 7. Ocular hypertension: Individuals with raised IOP more than 21mm of Hg with open angles, without any signs of increased CD ratio, or visual field changes. 41 (0.9%) cases are identified. 8. Congenital and Developmental glaucoma: Developmental anomalies of the angle associated with enlarged cornea and raised IOP that manifests in the child hood, 22 (0.5%) cases are recorded.

The percentage of subtypes of glaucoma is documented from their social background (Table.4). POAG prevalence is more in Tribal area (60.2%), than rural and urban areas. PACG is more in rural area (28.3%) than urban and tribal area. Secondary glaucoma more in tribal area (13.9%) (Table .4). POAG is more prevalent among Fisherman community in the urban area of North costal Andhra Pradesh.

The incidence of POAG is more during the 6th decade and above. The PACG incidence is more before 6th decade. Secondary glaucomas are common during the 3rd decade. NTG and OHT are common during the 4th decade. (Table. 5) PACG is classified under ESGEO guidelines and found 5 times more common among females and the incidence increased with the age (Table .6),

The sub types of PACD are analysed and found to be as follows. PACS is the most common variant among the PACD. And found to be more in the female gender. PACG is the next common variant also common among the females. (Table.7)

Discussion:-

Prevalence of Glaucoma have a geographical variations even in Asia and depends on other demographic factors.

Majority studies revealed the prevalence of POAG is more in Europe and PACG is more in the Asian continent. It is important to know the relevant causative factors to estimate the incidence, not only the race and age but also the ethnic variations in relation to the aetiology and different modes of study designs(8). The number of ageing people are on the rising side by 15% by 2050 (9). We want to ascertain the relation between POAG prevalence, ethnicity, age and gender.

In this study the incidence of POAG is more, especially in tribal population. Among the urban area POAG is also common among Fisherman community and they presented to the hospital at late stage. POAG is common in males, it could be due to the female community has the protective hormonal effects on the RNFL, and to the risk factors among the men. (10). Secondary glaucoma 3 times more common in males, congenital glaucoma is more common in girls.

Conclusion:-

Prevalence of glaucoma varies geographically. Age is the definite risk factor. Morbidity of glaucoma increases with the age.. POAG found to be the highest at 60 years of age or above. PACG is highest in between 40 to 60 years of age and is more common among female. Developmental glaucoma at the age of 6 -10 years, common among girls. Secondary glaucoma are more common below 40 years of age. Normal tension glaucoma and Ocular hypertension are common in between 40 - 60 years of age. Among PACD, PACS is the most common variant (11), followed by PACG. Females are more prone for Primary angle closure glaucoma.(12)

This study revealed the prevalence of various subtypes of glaucoma which varies ethnic wise. The prevalence of POAG is more (43.6%), followed by PACG (24.5%), secondary glaucoma (11.3%), Juvenile Open angle glaucoma (1.9%), Normal Tension Glaucoma (1%), ocular hypertension (0.9%), congenital glaucoma (0.5%)

Table .1:- Data showing the number of cases attended to OPD during the period.

•		No .Gen OP	No. Referrals to	No .Glaucoma
•			Glaucoma	cases confirmed
•	2016 -17			
•	Sep –Dec	13,856	379	357
•	2017 - 18	91,076	1589	1364
•	2018 - 19	98,379	1292	1170
•	2019 Dec	95,660	1576	1429
•	3yr 4mths	2,98,971	4836	4320 (1.44%)
•	(30 - 60yrs) 1,32,923		3164 (2.38%)

 Table .2:- Number of confirmed cases of Glaucoma:

	No of (
Time	Y	es	N	Total		
	Count	%	Count	%		
Sep - Dec 2016	357	94.2%	22	5.8%	379	
2017 - 18	1364	85.8%	225	14.2%	1589	
2018 - 19	1170	90.6%	122	9.4%	1292	
Upto Dec 2019	1429	90.7%	147	9.3%	1576	
	P	-value = 0	.001*		el	

Table.3:- suspect / or at risk:

Glaucoma Subtypes	Count	%	
Glaucoma suspects /at risk	702	16.3%	
POAG	1884	43.6%	
PAC/PACG	1057	24.5%	
JOAG	82	1.9%	
NTG	43	1.0%	
ОНТ	41	0.9%	
Secondary Glaucoma	489	11.3%	
Congenital & Dev. Glaucoma	22	0.5%	

Clausens Salteras	Urban		Rural		Tribal	
Glaucoma Subtypes	Count	%	Count	%	Count	%
Glaucoma suspects /at risk	593	23.8%	97	6.7%	12	3.1%
POAG	964	38.7%	686	47.6%	234	60.2%
PAC/PACG	580	23.3%	407	28.3%	72	18.5%
JOAG	57	2.3%	16	1.1%	9	2.3%
NTG	31	1.2%	10	0.7%	2	0.5%
OHT	23	0.9%	15	1.0%	3	0.8%
Secondary Glaucoma	238	9.5%	197	13.7%	54	13.9%
Congenital & Dev. Glaucoma	7	0.3%	12	0.8%	3	0.8%
	P	value = 0.0)01*			

Table.4:- Showing the prevalence of Glaucoma subtypes in social areas:

Table 5:- Age and gender ratio among the Glaucoma individuals:

Age	Cong / Dev Gl		JPOAG		GL.Su	GL.Suspect		POAG		PACG	
	м	F	м	F	м	F	м	F	м	F	
0 5	3	8									
6 10	5	6									
11 40			48	34	356	346			15	49	
41 - 60							409	322	226	622	
> 60							697	456	54	91	
P-value 0.375		-		-	-		0.053*		0.022*		

Table 6:- Table showing Gender ratio estimation of Glaucoma.

•	Male	Female
 Congenital / Juvenile Glaucoma 	. 8	14
 Juvenile POAG 	48	34
• POAG	1126	798
• PACG	295	762
• NTG	37	16
• OHT	32	19
 Secondary Glaucoma 	382	107

 Table 7:- Sub types of PACD.

	M	ale	Female		
	Count	%	Count	%	
PACS	99	25.6%	287	74.4%	
Plateau iris	18	32.1%	38	67.9%	
PAC OHT	87	45.1%	106	54.9%	
PACG	151	35.8%	271	64.2%	
	D 1	0.001*			

P-value = 0.001*

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