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A clinico-demographic profile of hypertensive retinopathy cases in a tertiary care hospital of South Odisha, India

Sarita Panda
Associate Professor, Department of Ophthalmology, MKCG Medical College and Hospital, Berhampur, Odisha.

Santosh Kumar Padhi
Additional District Public Health Officer (Vector Borne Diseases) Ganjam District, Odisha.

Saroj Shekhar Rath
Associate Professor, Department of Pediatrics, MKCG Medical College, Berhampur, Odisha, India

Swapna Mahapatra*
Assistant Professor, Department of Pharmacology, MKCG Medical College, Berhampur, Odisha, India
***Corresponding author**

Prangya Panda
HOD and Professor, Department of Ophthalmology, MKCG, Medical College and Hospital, Berhampur, Odisha.

***Abstract*---**Objective: To evaluate clinico-demographic profile of hypertensive retinopathy cases in a tertiary care hospital of South Odisha, India. Materials and methods: This was a Cross-sectional study conducted in the department of Ophthalmology, SLN Medical College, Koraput (Odisha) from July 2021 to February 2022. A total of 226 hypertensive patients were examined out of which 100 were found to manifest hypertensive retinopathy changes. These 100 patients were further evaluated and analyzed. Sample size of the study was 100 number of hypertensive retinopathy patients. Different investigations done in the patients are Visual acuity, refraction, BP measurement, Tonometry, Fundus examination, Gonioscopy, B scan, Renal profile, Blood sugar estimation. Demographic parameters like sources of cases, age, gender, area wise distribution. The cases were again assessed to find out level of hypertension control, duration since hypertensive etc. Results: Hypertensive retinopathy grading distribution among hypertensives with controlled blood pressure was

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56.25%, 31.25% and 12.50% into Grade I, II and III respectively, showing lesser incidence of end organ damage with better control of blood pressure levels. Conclusion: There is a significant correlation between increasing age, blood pressure levels and severity of sclerotic changes with severity of retinopathy. Further studies in hypertensive retinopathy patients will definitely decrease the progression of this disease and lower incidences of blindness in our community.

***Keywords*---**Hypertension, Retinopathy, Ophthalmoscopic features.

Introduction

Hypertension affects nearly 26 per cent of the adult population worldwide. Kearney and colleagues estimated that the prevalence of hypertension in 2000 was 26% of the adult population globally and that in 2025 the prevalence would increase by 24% in developed countries and 80% in developing countries [1].Systemic hypertension is one of the most common diseases in adult population. Hypertensive retinopathy represents the ophthalmic finding of end organ damage secondary to systemic hypertension. It commences asymptomatically, so its early detection & adequate treatment is very essential to reduce complication & thence the quality of life. Retinal vessels can be assessed because of their unique accessibility & inference can be made as to the condition of vessels of similar size elsewhere in the body. Some ophthalmoscopic findings are useful in evaluating the duration, severity and predictions of hypertensive vasculopathy [2]. Retinal microvascular changes are signs of hypertensive retinopathy and it can be useful to find out risk factors and planning the treatment protocol for hypertension [3]. So, earlier detection of hypertensive patients who are at risk to develop target organ damage is very much crucial. In this study we are going to estimate the clinic-demographic profile of hypertensive retinopathy which may prevent further progression of this disease.

Materials and Methods

This was a cross-sectional study conducted in the department of Ophthalmology, SLN Medical College, Koraput (Odisha) from July 2021 to February 2022. A total of 226 hypertensive patients were examined out of which 100 were found to manifest hypertensive retinopathy changes. These 100 patients were further evaluated and analyzed. So, sample size in this study was 100 number of hypertensive retinopathy patients. The study was undertaken after approval from Institutional Ethical committee (IEC).

Inclusion criteria:
All hypertensive patients presenting with features of

- Hypertensive retinopathy of varying severity.
  - Essential hypertension: Systolic BP > 140mmHg, Diastolic BP > 90mmHg.
  - Malingant hypertension: Systolic BP > 240mmHg, Diastolic BP > 140mmHg.
  - Pregnancy induced hypertension: > 20wks of gestation

- Systolic BP > 140mmHg, Diastolic BP > 90mmHg.
- Hypertension associated with ocular complications like retinal venous obstruction, neovascularisation, arterial obstruction.

Exclusion Criteria:

- All the patients who are not willing for fundus examination.
- Those patients with media opacities.
- Diabetic retinopathy / Individuals with hyperglycemic status.
- Ocular ischemic syndrome.
- Bilateral CRVO
- Collagen vascular disease; Hyper-viscosity syndrome.
- Anemic retinopathy, sickle cell retinopathy, Radiation retinopathy.

Different investigations done in the patients are Visual acuity, refraction, BP measurement, Tonometry, Fundus examination, Gonioscopy, B scan, Renal profile, Blood sugar estimation.

Statistical Analysis

Variables were processed, edited and analyzed by SPSS windows version 17.0. Socio-demographic data of the study population were expressed in frequency distribution and their observed difference was tested by 'chi square'test. P value<0.05 was considered as statistically significant.

Results

226 cases were examined in this study out of which 100 patients showed hypertensive retinopathy changes and these cases were analyzed as below.

Table-1: Sources Of Hypertensive Retinopathy Cases (N=100)

CASES	NO. OF CASES	PERCENTAGE
Opd	75	75%
Referred cases	25	25%

Most of the patients of our study were from Outdoor (75%) of our SLN hospital, Koraput.

Table-2: Age and Gender-Wise Distribution Of Hypertensive Retinopathy Cases (N=100)

AGE IN YEARS	MALE (n,%)	FEMALE (n,%)	Total (n,%)
18 – 40	2 (28.6%)	5 (71.4%)	7(100%)
40 – 55	17 (65.4%)	9(34.6%)	26(100%)
55 – 70	22 (45.83%)	26(54.17%)	48(100%)
70	11 (57.89%)	8 (42.11%)	19(100%)
Number	52	48	100(100%)

Majority of the patients were in the age group of 55-70 years. 52% of cases were male and 48% were female patients.

Table-3: Area wise distribution of Hypertensive retinopathy cases (n=100)

	NO. OF CASES	PERCENTAGE
URBAN	32	32%
RURAL	68	68%

Out of all cases 68% of the Hypertensive retinopathy were from rural area and 32% cases were from urban area.

Table-4: Blood pressure control levels in hypertensive retinopathy cases (N=100)

BP LEVELS	No. of cases	%
Controlled BP	16	16%
Stage I Hypertension	28	28%
Stage II Hypertension	35	35%
Severe Hypertension	19	19%
Malignant Hypertension	2	2%
Total cases	100	100%

Majority of the cases (35%) belonged to Stage II hypertension, followed by Stage I (28%). 16% patients had controlled blood pressure, while least (2%) were having malignant hypertension.

Table-5: Gender-wise distribution of hypertensive retinopathy grading

Grade of Hypertensive retinopathy	MALE (n,%)	FEMALE (n,%)	Total (n,%)
Grade I	22 (46.80%)	25 (53.20%)	47 (100%)
Grade II	19 (53.19%)	15 (46.81%)	34 (100%)
Grade III	9 (52.94%)	8 (47.06%)	17 (100%)
Grade IV	2 (100%)	0	2 (100%)

Majority of the cases had Grade I hypertensive retinopathy (47 patients), followed by grade II (34 patients). Among the Grade I hypertensive retinopathy cases, majority (53.2%) were females, while in Grade II hypertensive retinopathy, majority were male (53.19%) patients.

Table-6: Distribution of hypertensive retinopathy grading among age groups (N=100)

Grading of hypertensive retinopathy	18 – 40 yrs	40 – 55 yrs	55 – 70 yrs	> 70 yrs	Total (n)
Grade I	4 (57.14%)	14 (53.84%)	25 (52.08%)	4 (21.05%)	47
Grade II	0 (0%)	10 (38.46%)	16 (33.33%)	8 (42.10%)	34
Grade III	1 (14.28%)	2 (7.70%)	7 (14.59%)	7 (36.85%)	17
Grade IV	2 (28.56%)	0	0	0	2

Total (n,%)	7(100%)	26(100%)	48(100%)	19 (100%)	

Out of 100 cases, majority of the cases had Grade I hypertensive retinopathy (47 patients). Among the Grade I hypertensive retinopathy cases, majority (25 patients) were between the age group of 55-70 age group. Similarly Grade II hypertensive retinopathy was seen in (34 patients) out of which majority were between the same (55-70) age group.

Table-7: Distribution of duration of hypertension in hypertensive retinopathy cases (N=100)

Duration	No. Of patients	Percentage
0-6 months	9	9%
6 months – 3 yrs	11	11%
3 - 10 yrs	18	18%
> 10yrs	21	21%
Undetected	41	41%
Total	100	100%

Majority of the cases (41%) had never been detected as hypertensive, followed by 21% of the cases were Hypertension has been detected since 10years.

A-V Crossing changes were noted in almost all cases. Gunn's sign & Haemorrhages were the most common finding of the AV crossing changes (94.11%). Salu's sign manifested in (70.58%) of cases and was seen as the sole AV crossing change in 2 cases (5.89%). Proximal venous congestion was noted in 5 cases (14.70%). Focal and segmental arterial narrowing was less common than in Grade III arterial narrowing. Haemorrhage was the most common finding in Grade II, III retinopathy. Single hemorrhage was noted in 4 cases (11.76%). A single vein occlusion (2.94%) in the superotemporal region was noted. Cotton wool spots were noted in 13 cases (76.47%). Soft & hard exudate was noted in 7 cases (41.17%).

Discussion

A total of 226 hypertensive patients were selected, out of which, 100 patients were having hypertensive retinopathy changes, which were taken as study population. Prevalence of hypertensive retinopathy in our study was 67%, whereas other studies [4,5] found prevalence of (30.6% to 33.9%) Most of the patients of our study were from Outdoor (75%). Majority of the patients were in the age group of 55-70 years. 52% of cases were male and 48% were female patients. Out of all cases 68% of the Hypertensive retinopathy were from rural area. Majority of the cases (35%) belonged to Stage II hypertension, followed by Stage I (28%). 16% patients had controlled blood pressure, while least (2%) were having malignant hypertension. Majority of the cases had Grade I hypertensive retinopathy (47 patients), followed by grade II (34 patients) whereas a study [6] showed prevalence of grade I and grade II retinopathies among hypertensive patients was 46% and 32%, respectively, and only a few patients showed grade III & IV hypertensive retinopathy. Among the Grade I hypertensive retinopathy cases, majority (53.2%)

were females, while in Grade II hypertensive retinopathy, majority were male (53.19%) patients. In a study [7] majority of the cases were male patients.
Out of 100 cases, majority of the cases had Grade I hypertensive retinopathy (47 patients). Among the Grade I hypertensive retinopathy cases, majority (25 patients) were between the age group of 55-70 age group comparable to another study [7]. Similarly Grade II hypertensive retinopathy was seen in (34 patients) out of which majority were between the same (55-70) age group. Majority of the cases (41%) had never been detected as hypertensive, followed by 21% of the cases were Hypertension has been detected since 10years,similar to the study [7] where hypertensive retinopathy was maximum with duration of hypertension more than 5 years. Hypertensive patients whose blood pressure was uncontrolled were more likely to develop retinopathy than individuals whose blood pressure was controlled with medication, similar to a study [8,9].

The prevalence of specific hypertensive retinopathy abnormalities was AV crossing changes in 51%, segmental narrowing 8%, Focal constrictions in 5%, Retinopathy in 17%, severe arteriosclerotic changes in 4% & complicated with BRVO and one with BRAO. Hypertensive retinopathy grading distribution among hypertensives with controlled blood pressure showing lesser incidence of end organ damage with better control of blood pressure levels, similar result seen with another study [8].

Conclusion

Hypertensive retinopathy is present in less than half of the patients examined and Grade I hypertensive retinopathy is the most common type noted. There is a significant correlation between increasing age, blood pressure levels and severity of sclerotic changes with severity of retinopathy. Patients with CVA and Micro-albuminuria show significant association with increasing grades of hypertensive retinopathy which indicates micro-vascular damage. This warrants an evaluation concerning these systems in patients, especially with higher grades of hypertensive retinopathy.

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