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A Cross Sectional Study for Evaluation of Association between Hypertensive Retinopathy with Serum Lipid Profile in Patients of Essential Hypertension in Rural Hospital.

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Abstract: - To evaluate the role of serum lipid profile on fundus changes in hypertensive patients and to correlate the grades of hypertensive retinopathy with components of lipid profile. Material and method: A cross-sectional prospective study was carried out in 100 patients attending the Ophthalmology department who were diagnosed to have systemic hypertension. The stage of hypertension was classified according to JNC 7 criteria. Patients suffering from diabetes, myopia, having hazy media and other posterior segment disorders and giving consent were excluded from the study. Their detailed ophthalmological examination was carried out and also their evaluation by physician was done. All the patients were investigated for fasting serum lipid profile done by end point method using spectrophotometer. Fasting was for 8 hours. Hypertensive fundus changes were evaluated using the Keith – Wagener and Barker (KWB) Classification. Discussion: Out of 100 patients with essential hypertension, 70 (70%) had retinopathy and the remaining 30 (30%) patients had no retinopathy. Mean age having retinopathy was 63 years. All patients having hypertension for more than 10 years had retinopathy. Severity of hypertension correlated well with severity of retinopathy in our study (p< 0.0009). No sex preponderance toward developing retinopathy was found (p< 0.58). A positive correlation of hypertensive retinopathy was found with total cholesterol (p<0.0001), low-density lipoprotein (LDL)-cholesterol (p<0.0001), serum triglycerides (p<0.0001), and a low density lipoprotein: high density lipoprotein (LDL: HDL) ratio (p<0.0008). Conclusion: This study helps to assess the association between hypertensive retinopathy in patients of essential hypertension with an altered serum lipid profile, with the aim of preserving vision.

Keywords: Hypertensive, Hypertensive retinopathy, Serum lipid.

I. INTRODUCTION

- Systemic hypertension is a state of persistently elevated Blood pressure above 140/90 mm of Hg based on an average of two or more blood pressure readings taken on two or More visits.[1]
- Hypertension affects approximately one billion people worldwide.
- As the population ages, the prevalence of hypertension will increase even further unless broad and effective preventive measures are implemented.
- The seventh report of the Joint National Committee (JNC 7) on prevention, detection, evaluation and treatment of high blood pressure recommends evaluation of Hypertensive Retinopathy as a part of standard care of hypertension and lists Hypertensive Retinopathy as a marker of target organ damage.3
- Hypertension and hyperlipidemia not only accelerate atherogenesis but also cause degenerative changes in the walls of large- and medium-sized arteries,[5] which accelerate cerebrovascular hemorrhage,[6] ischemic heart disease,[7] and cardiac arrest.[8-10]
- Hence, this study helps to assess the association between hypertensive retinopathy in patients of essential hypertension with an altered serum lipid profile, with the aim of preserving vision.

II. PURPOSE OF STUDY

- Dyslipidemia → a risk factor for retinopathy and other ocular abnormalities.
- An understanding of hypertensive retinopathy manifestations and their association with components of lipid profile (LDL, HDL, total cholesterol and Triglycerides) may be helpful in risk stratification and in tailoring of anti-hypertensive and lipid lowering treatment.
- Hence this study was carried out to assess the association between hypertensive retinopathy in patients of essential hypertension with an altered serum lipid profile, with the aim of preserving vision by giving a lipid lowering treatment.

III. AIMS AND OBJECTIVES

- To study correlation between serum lipid profile and hypertensive changes in fundus in essential hypertension.
- To study the role of hyperlipidemia on fundus changes in hypertensive patients and their correlation.

IV. MATERIAL AND METHODS:

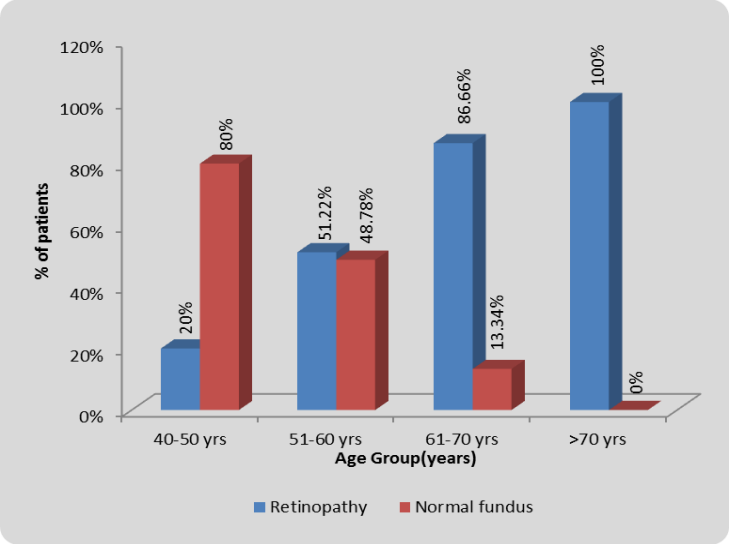
- A cross-sectional prospective study was carried out in 100 patients attending the Ophthalmology department who were diagnosed to **have systemic hypertension.**
- The stage of hypertension was classified according to JNC 7 criteria.
- **EXCLUSION CRITERIA:** Patients suffering from diabetes, myopia, having hazy media and other posterior segment disorders and not giving consent.
- Their detailed ophthalmological examination was carried out and also their evaluation by physician was done.
- All the patients were investigated for fasting serum lipid profile done by end point method using spectrophotometer. Fasting was for 8 hours.
- Hypertensive fundus changes were evaluated using the Keith – Wagener and Barker (KWB) Classification.

OBSERVATIONS

TABLE 1: Age wise retinopathy changes

Age distribution(years)	Retinopathy(%)	Normal fundus(%)	Total	⧢2-value
40-50 yrs	1(20%)	4(80%)	5	72.00 p=0.0001,S
51-60 yrs	21(51.22%)	20(48.78%)	41	0.08 p=0.77,NS
61-70 yrs	39(86.66%)	6(13.34%)	45	109.5 p=0.0001,S
>70 yrs	9(100%)	0	9	200.0 p=0.0001,S
TOTAL	70	30	100	
MEAN±SD	63.42±6.62	56.1±5.95		

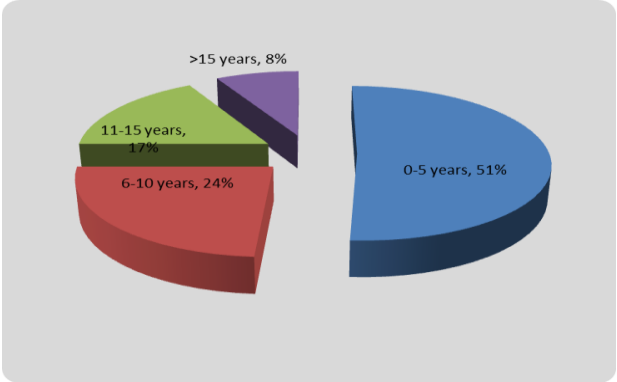
Out of 100 patients in the study group, 70 patients belong to retinopathy group with mean age of 63.42±6.62 years, while 30 patients does not have retinopathy with mean age of 56.1±5.95 years



Duration of hypertension(years)	Total number of patients
0-5 years	51
6-10 years	24
11-15 years	17
>15 years	8
TOTAL	100
Mean±SD6.005±3.9	

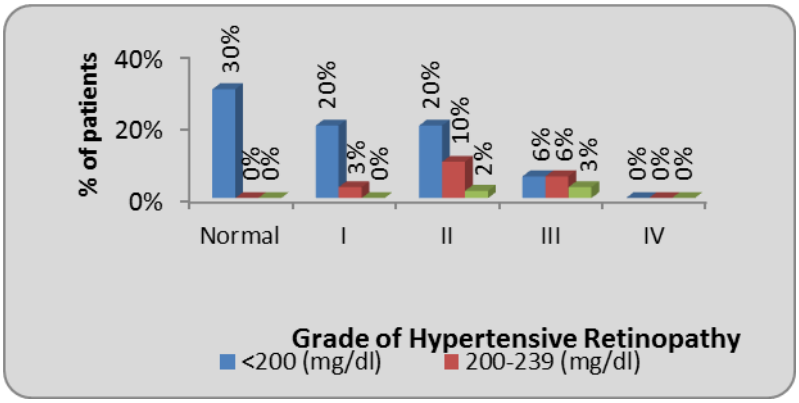
TABLE 2: Duration of Hypertension

Out of 100 patients, 51 (51%) patients had hypertension since 0-5 years. There were 24 patients having hypertension since 6-10 years. This was correlated with study done by Rajendra P Gupta et.al



Out of 100 patients, 76(76%) had total serum cholesterol within normal limits, of which 46(60.52%) patient had retinopathy of varying degrees. The next group of 19(19%) patient had total serum cholesterol between 200-239mg/dl(borderline),of which all had retinopathy. In the last group 5(5%) patient had total serum cholesterol >240mg/dl and all showed retinopathy.

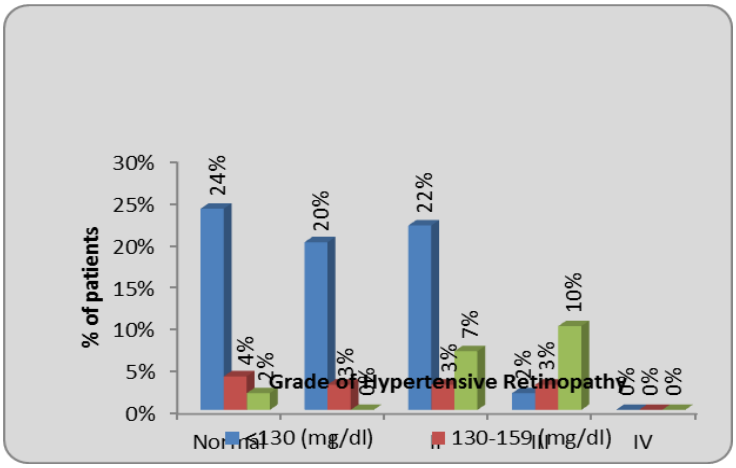
TABLE 3: Relationship of Hypertensive Retinopathy with Serum Total Cholesterol



Grade of Hypertensive Retinopathy	<130 (mg/dl)	130-159 (mg/dl)	≥160 (mg/dl)	Total patients	ᵹ2-value
Normal	24	4	2	30	34.19 p=0.0001,S
I	20	3	0	23	
II	22	3	7	32	
III	2	3	10	15	
Iv	00	00	00	00	
TOTAL PATIENTS	68	13	19	100	

Table 4: Relationship between Hypertensive Retinopathy and Serum LDL Cholesterol

Out of 100 patient, 68(68%) patient had serum LDL cholesterol <130mg/dl(normal),of which 44 (64.70%) had retinopathy of varying degrees. In the next group, 13(13%) patients had serum LDL cholesterol level in the range 130-159 mg/dl(borderline) of which 9 (69.23%) had retinopathy. And in the last group 19(19%) patient had serum LDL cholesterol levels >160 mg/dl(abnormal) in which 17 (89.47%) had retinopathy.



Grade of Hypertensive Retinopathy	>60(mg/dl) Desirable	36-60 (mg/dl) Borderline	<35(mg/dl) Abnormal	Total patients	ᵡ2-value
Normal	02	20	08	30	2.39 p=0.88,NS
I	02	18	03	23	
II	03	24	05	32	
III	01	10	04	15	
IV	00	00	00	00	
TOTAL PATIENTS	08	72	20	100	

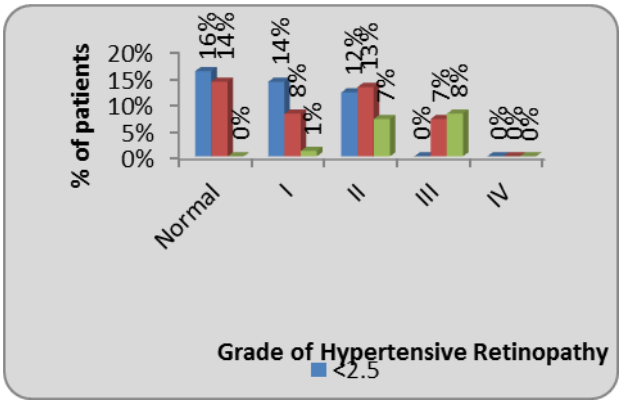
TABLE 5: Relationship of Hypertensive Retinopathy with Serum HDL Cholesterol

Out of 100 patients, 8 (8%) had serum HDL cholesterols >60mg/dl and 6 had retinopathy. The next group of 72 patients had serum HDL cholesterols levels in the range of 36-60mg/dl (borderline) of which 52(72.22%) had retinopathy and 20(27.78%) had no retinopathy. And 20 patients had <35mg/dl (abnormal) serum HDL cholesterol of which 12(60%) had retinopathy.

rade of Hypertensive Retinopathy	<2.5	2.5-5.0	>5.00	TOTAL PATIENTS	ᵡ2-value
Normal	16	14	00	30	30.36 p=0.0001,S
I	14	08	01	23	
II	12	13	07	32	
III	00	07	08	15	
IV	00	00	00	00	
TOTAL PATIENTS	42	42	16	100	

TABLE 6: Relationship between Hypertensive Retinopathy and HDL: LDL ratio.

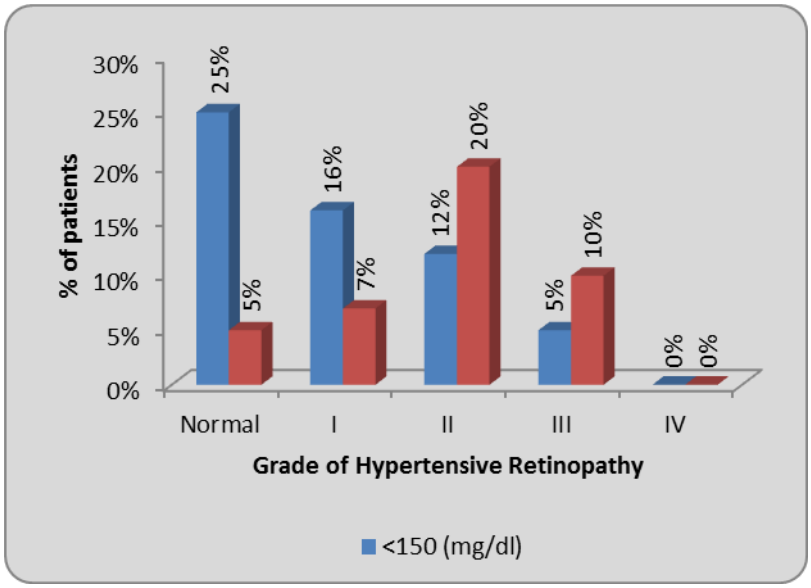
Out of 100 patients, 42 patients had serum LDL: HDL ratio <2.5, of which 26(61.90%) had varying degree of retinopathy and 16(38.10%) had normal fundus. The next group of 42 patients had serum LDL:HDL ratio of between 2.5-5.0, of which 28(66.66%) had retinopathy and 14(33.34%) had normal fundus. And in the last group 16 patient had serum LDL:HDL >5.00 of which all 16(100%) had retinopathy.



Grade of Hypertensive Retinopathy	<150 (mg/dl)	>150 (mg/dl)	Total patients	ꙅ2-value
Normal	25	05	30	18.43 p=0.0004,S
I	16	07	23	
II	12	20	32	
III	05	10	15	
IV	00	00	00	
TOTAL PATIENTS	58	42	100	

TABLE 7: Relationship of Serum Triglycerides with Hypertensive Retinopathy

Out of 100 patients, 58 patients had serum triglycerides level <150mg/dl, of which 33(56.89%) had varying degree of retinopathy and 25(43.11%) had normal fundus. The next group of 42 patients had serum triglycerides >150mg/dl, of which 37(88.09%) had retinopathy and 5(11.91%) had normal fundus.



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