

A COMPARATIVE STUDY OF THE RETINOPATHY CHANGES IN DIABETIC PATIENTS [TYPE 2] WITH AND WITHOUT THE METABOLIC SYNDROME [COM- PRISES CENTRAL OBESITY, HYPERTENSION AND DYSLIPIDEMIA]

Ophthalmology

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KEYWORDS

AIM-

To study and compare the severity of the retinopathy changes in patients with type II diabetes mellitus with and without the metabolic syndrome.[hypertension ,obesity and dyslipidemia].

MATERIALS AND METHODS

PATIENTS AND METHODS

A total of about 120 patients were included in the study. The patients were divided into 2 groups - 60 patients with only type II diabetes mellitus and 60 patients with the metabolic syndrome. Patients in the age group of 30-60 were included in the study. The study was conducted in RIOGOH and GGH in Chennai. A detailed history of the patients' age, sex, occupation, life style, duration and the type of treatment was elicited. A complete ocular evaluation included visual acuity, intra ocular tension, slit lamp examination of the anterior segment and fundus examination by direct and indirect ophthalmoscope. Complete lab investigations included fasting and post prandial blood sugar, fasting lipid profile, urea and creatinine. General examination included patients waist circumference and blood pressure in the supine position. A fasting blood sugar >110 mg/dl was considered as diabetes mellitus. Diagnosis of metabolic syndrome according to NCEP III criteria is the presence of atleast 2 of the following- a)hypertension- BP $>130/85$ mm Hg in atleast 3 occasions b)obesity-BMI >30 c)TGL >150 mg/dl d)HDL <50 mg/dl e)total cholesterol >220 mg/dl. Exclusion criteria were patients with severe cardiac and renal diseases and any secondary factors like drugs causing dyslipidemia.

RESULTS AND ANALYSIS-

The final results of only 50 patients in each group were taken into account. Uncooperative patients and very ill patients who could not come for follow up were not considered for Statistical analysis [about 10 in each group]. Out of the 50 patients with only diabetes mellitus type II, 30 patients had no to mild NPDR retinopathy change, 15 patients had mild to moderate NPDR changes and 5 patients had PDR changes. Out of the 50 diabetes mellitus patients with metabolic syndrome 25 patients had moderate to severe NPDR with grade 2 to 3 hypertensive changes, 15 patients had PDR with grade II to III hypertensive changes with changes due to dyslipidemia. 10 patients had combined retinopathy changes involving the disc and macula and visual acuity of $<6/60$ to absence of PL in severe cases.

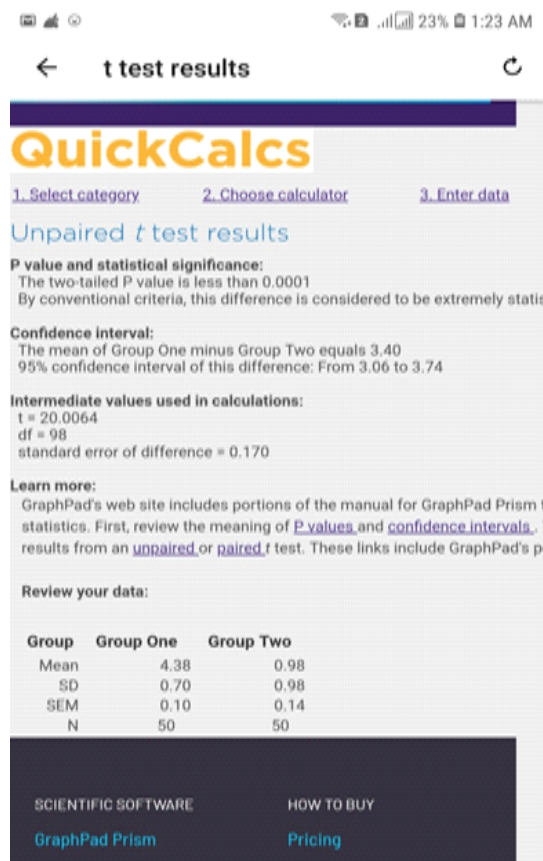
Patients were given SCORES according to the retinopathy findings as

SCORE FUNDUS FINDINGS AND VISUAL ACUITY

- 0 no PL [severe retinopathy]
- 1- features of combined retinopathy with involvement of the disc and macula with less than 6/60
- 2- less severe than the above and visual acuity 6/60-6/36
- 3 Visual acuity 6/36 -6/18 –hemorrhages or exudates to minimum AV changes
- 4 Visual acuity 6/18 - 6/9 with few vessel changes
- 5 Normal fundus

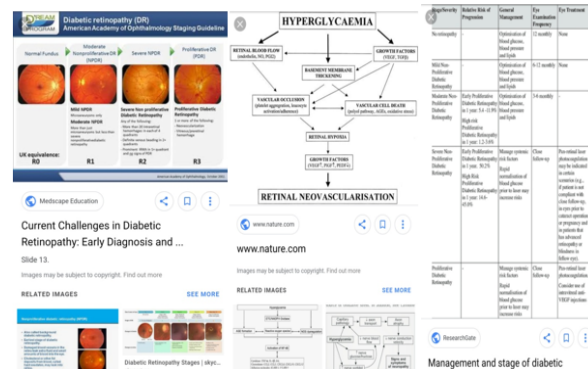
The patients were divided into the 2 study groups –GROUP I-Patients with only diabetes mellitus and GROUPII –Patients with diabetes mellitus and the metabolic syndrome and SCORES were given according to the fundus changes

STATISTICAL ANALYSIS were done using the SPSS software package. The results obtained are as follows

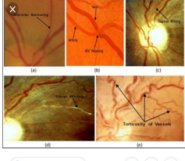


The significance of the differences between the 2 group means was tested by the t-test and a P value <0.0001 was obtained and was considered statistically significant. $t=20.0064$. This study showed that metabolic syndrome caused more retinopathy changes and damages in diabetic patients.

PATHOPHYSIOLOGY OF DIABETES MELLITUS



PATHOPHYSIOLOGY OF HYPERTENSION



Scheie classification

Stage 0: No visible retinal abnormalities
 Stage 1: Mild generalized arteriolar narrowing with focal constriction
 Stage 2: More pronounced arteriolar narrowing with focal constriction
 Stage 3: Focal and diffuse arteriolar narrowing with focal constriction
 Stage 4: Retinal edema, focal exudates, optic disc edema

Table 1: Classification of Blood Pressure in Adults*

Category	Blood Pressure
Optimal	<120/80 mm Hg
Normal	<130/85
High-normal	130-139 Systolic or 85-89 Diastolic
Hypertension*	
Stage 1	140-159 Systolic or 90-99 Diastolic
Stage 2	160-179 Systolic or 100-109 Diastolic
Stage 3	>180 Systolic or >110 Diastolic

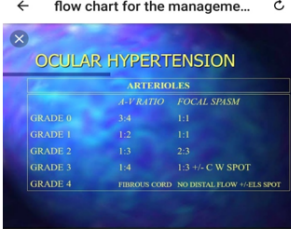
Hypertensive retinopathy

Differential Diagnosis: Diabetic retinopathy, Collagen vascular diseases, TO

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 Hypertensive retinopathy (HR) is a retinal disease which happened due to consistent high blood pressure (hypertension). In this paper, an automated hybrid decision support system is proposed to detect the presence of HR.

flow chart for the manage... 

OCULAR HYPERTENSION

GRADE	ARTERIOLES A-V RATIO	FOCAL SPASM
GRADE 0	3:4	1:1
GRADE 1	1:2	1:1
GRADE 2	1:3	2:3
GRADE 3	1:4	1:3 +/- C-W SPOT
GRADE 4	FIBROUS CORD	NO DISTAL FLOW +/- L.S. SPOT

KEY POINTS

- Presence of hypertensive retinopathy may convey prognostic information on the risk of cardiovascular disease.
- Retinal arteriolar narrowing is associated with an increased risk of hypertension and may precede the development of hypertension.
- Wall-to-lumen ratio of retinal arterioles may be predictive of end-organ damage. Adaptive optics is a promising tool allowing precise wall-to-lumen sizing of arterioles.
- Optical coherence tomography (OCT) may be a useful tool to assess retinal and choroidal changes in malignant hypertension.
- Intraocular injections of anti-vascular endothelial growth factors (anti-VEGF) may be a useful adjunctive therapy in the management of some selected cases of severe hypertensive retinopathy.

HYPERTENSIVE RETINOPATHY DR
 AJAY DUDANI DR YASHESH MANIAR...

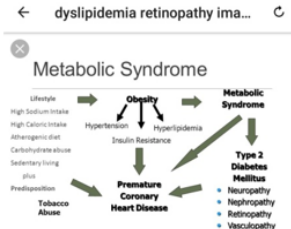
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Diagnosis Objectives
 Ocular Hypertension

PATHOPHYSIOLOGY OF THE METABOLIC SYNDROME

dyslipidemia retinopathy ima... 

Metabolic Syndrome

Lifestyle: High Sodium Intake, High Caloric Intake, Ultra-processed diet, Carbohydrate abuse, Sedentary living, plus, Predisposition, Tobacco Abuse

Obesity → Hypertension → Hyperlipidemia → Insulin Resistance → Type 2 Diabetes Mellitus

Premature Coronary Heart Disease

Neuropathy, Nephropathy, Retinopathy, Vasculopathy

Classification of LDL and Total Cholesterol*

LDL Cholesterol (primary target of therapy)	
<100mg/dL	Optimal
100-129mg/dL	Near optimal/above optimal
130-159mg/dL	Borderline high
160-189mg/dL	High
>190mg/dL	Very high

Total Cholesterol	
<200mg/dL	Desirable
200-239mg/dL	Borderline high
>240mg/dL	High

How Hypertension and High Cholesterol Harm the Eye

(This can occur with an acute increase in blood pressure, as in malignant hypertension, or continued chronic HTN 6)

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Dyslipidemia, abnormal endogene...
 Vascular Obesity
 Low HDL Cholesterol
 Insulin Resistance
 Metabolic Syndrome

PATHOPHYSIOLOGY OF DYSLIPIDEMIA

Increased in LDL leads to atherosclerosis and microvascular damage and also emboli and retinal infarction. Increased triglycerides can increase the viscosity of the blood.

Goals for Diabetes Management

- Glycemia – A1C < 7% ADA, < 6.5% AACE
- Hypertension – < 130/80 mm Hg
- Dyslipidemia
 - LDL < 100 mg/dL (< 70 mg/dL in very high risk)
 - HDL: men > 40 mg/dL, women > 50 mg/dL
 - Triglycerides < 150 mg/dL
- Prothrombotic state – ASA Rx (81–325 mg/day)
- People with DM + CVD
- People > 40 years of age with DM + > 1 other CV risk factor
- Cigarette smoking – Cessation

Pathophysiology of Diabetes and Dyslipidemia: New Perspectives on ...

Slide 34. Goals for Diabetes Management

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CONCLUSION

Regardless of the criteria used for the diagnosis, diabetic patients with metabolic syndrome [Group II] had significantly increased microvascular complications than diabetic patients without the syndrome [GROUP I]. The prevalence of each microvascular complication directly and significantly correlated with the number of metabolic syndrome components. Early intervention and follow up helped in preventing further visual deterioration.

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