Original Research Paper

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Ophthalmology

CORRELATION OF CORNEAL ARCUS WITH SERUM LIPID PROFILE

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ABSTRACT

PURPOSE : To study the correlation of serum lipid profile in patients with corneal arcus.

MATERIALS AND METHODS: Hospital based cross-sectional study of 60 patients with corneal arcus attending ophthalmic OPD between June 2021 – November 2021 aged more than 40 years included in the study. A detailed history including risk factors such as diabetes mellitus, hypertension, cerebrovascular accident, coronary artery disease were also taken. Presence of arcus was determined by slit lamp examination and those subjects with >180 degrees arcus were taken into study. Lab study of lipid profile which includes Cholesterol, Triglycerides, High Density Lipoproteins, Low Density Lipoproteins, Very Low Density Lipoproteins were noted.

RESULTS : Deranged lipid profile was found to be significantly associated in patients with corneal arcus.

CONCLUSION : Strong correlation between corneal arcus and deranged lipid profile was found. Screening of patients with arcus can easily be performed and could be considered as a screening tool for cardiovascular and cerebrovascular diseases at primary levels of health care to aid early detection and management of alarmingly rising cardiovascular and cerebrovascular morbidity and mortality.

KEYWORDS :

INTRODUCTION :

Corneal arcus or arcus lipoides is deposition of lipid in peripheral cornea. It occurs commonly in elders above 60 years. When it occurs in younger population it is called arcus juvenilis. Arcus is made up of phospholipids, cholesterol and triglycerides of which serum triglyceride levels were found to be elevated in most of these cases in many studies.It appears first in the inferior and superior segment of cornea and gradually extends to involve entire circumference of cornea. If altered lipid metabolism is found, these cases require thorough evaluation of cardiovascular and cerebrovascular status.

MATERIALS AND METHODS :

Hospital based cross-sectional study of 60 patients with corneal arcus attending ophthalmic OPD between June 2021 – November 2021 aged more than 40 years included in the study. A detailed history including risk factors such as diabetes mellitus, hypertension, cardiovascular accident, coronary artery disease, renal dysfunction was also taken. Presence of arcus was determined by slit lamp examination and those subjects with >180degrees arcus were taken into study. Lab study of lipid profile which includes Cholesterol, Triglycerides, High Density Lipoproteins, Low Density Lipoproteins, Very LowDensity Lipoproteins were noted.

Inclusion Criteria:

1. Age > 40 years.
2. Subjects with >180 degrees arcus in one or both eyes.

Exclusion Criteria :

1. Subjects with early arcus.

Lipid profile assessed using NCEP ATP III guidelines:

Table 1. Normal Lipid Profile

Variable assessed	Normal values(mg/dl)
Serum cholesterol	140 - <200
Triglycerides	60 - <150
HDL	40 - <60
LDL	50 - <100
VLDL	12 - <30

OBSERVATIONS / RESULTS :

Age Distribution

The mean age of the study group was found to be 56 years. Most of the males were in the age group of 60-70 years while females were in the age group of 50-60 years.

Gender Distribution

Most of the patients in our study were found to be males (60%). Male to female ratio was 3:2 in our study.

Risk Factors/ Comorbidities

No risk factor was found in almost half of the patients whereas the other half had history of cerebrovascular accident (7%),hypertension (7%), diabetes mellitus (14%), coronary artery disease (7%), both hypertension and cerebrovascular accident (14%).

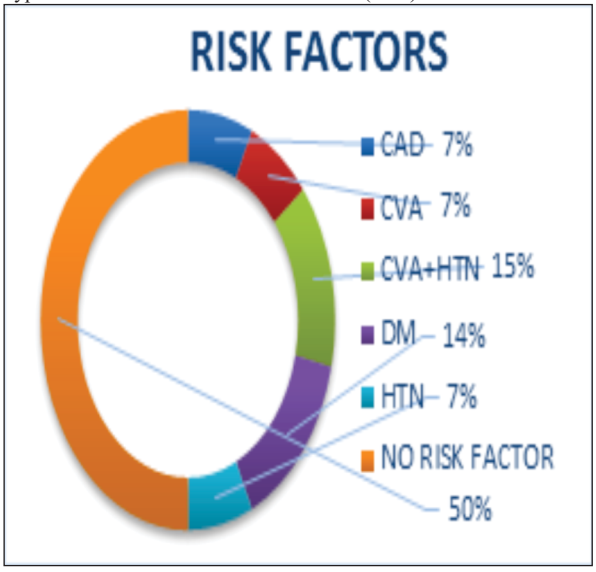

Figure1. Comorbidities/Risk Factors

Lipid Profile Analysis:

Table 2. Lipid Profile Analysis

Variable assessed	AbnormalValues	Percent%	P-value
HDL	<40mg%	40	0.008
VLDL	>30mg%	45	0.006
LDL	>100mg%	46.6	0.001
TRIGLYCERIDES	>150mg%	51.6	0.005
CHOLESTEROL	>200mg%	53.3	0.001

HDL levels in our study were found in the range 12 – 59 mg%. In our study low HDL were found to be significantly associated with corneal arcus(P=0.008). It is similar to study by Chambless et al., in which low HDL were found to be associated with corneal arcus.

Cholesterol levels in our study were found to be between 148 – 238 mg%. Significant association was found between serum Cholesterol levels and corneal arcus. In our study (P=0.001). Similar results were found in studies of Chua et al., and Moosavi et al.,

VLDL levels were found between 12- 47 mg%. Significant association was found between VLDL and corneal arcus (P=0.006).

LDL levels were found between 56 - 136 mg% in our study. Significant association was found between LDL and corneal arcus (P=0.001).

Triglycerides levels were found between 64 – 230 mg%. Significant association was found between Triglycerides and corneal arcus in our study (P=0.008).Similar results were found in studies of Chua et al., Moosavi et al and .,Chambless et al.,

Therefore, a significant correlation between altered lipid profile and arcus senilis was found in our study. All the variables assessed in lipid profile were found to be independently associated with arcus senilis.

DISCUSSION :

Significant association between arcus senilis and lipid profile abnormalities in older patients was found in our study.This is consistent with the findings of the study by Chua et al. which was performed on subjects aged >49 years, confirmed the association of corneal arcus with hypercholesterolemia and hypertriglyceridemia in older patients; and Rouhuanein et al. which revealed association of corneal arcus with old age and hypercholesterolemia, and a positive correlation with ultrasonographically assessed atherosclerosis in carotid and femoral arteries. A Study by Moosavi et al. in patients aged above 30 years, revealed association of corneal arcus with increase in age and hypercholesterolemia in patients with recent acute myocardial infarction.

Some studies showed significant association only in younger age groups and in individuals with familial dyslipidemias. A Study by Lertchavanakul A et al. showed significance of dyslipidemia in patients with arcus in less than 50 years of age. A Study by Fernandez et al. which included the age group 30 – 60 years, concluded that corneal arcus was not found to be an independent risk factor for coronary artery disease.

CONCLUSION :

Arcus senilis can be diagnosed with simple torch light examination and thus can serve as a screening tool at primary levels of healthcare. These changes although age related can serve as a clinical diagnostic tool in identification of patients with cardiovascular disease. Eliciting history of comorbidities and screening for comorbid conditions such as Diabetes and Hypertension can help identify patients at higher risk of cardiovascular diseases .Counselling of the patient and referral to specialist tertiary care centre can be promptly done so that cardiovascular and cerebrovascular accidents can be prevented.

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