ORIGINAL RESEARCH PAPER

Biochemistry

A STUDY OF SERUM LIPID PROFILE IN PATIENTS WITH CATARACT AND COMPARSION WITH HEALTHY CONTROLS

KEY WORDS: Lipid profile, Triglyceride, cholesterol, HDL, LDL, Cataract.

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ABSTRACT

Background- Comparative study of serum lipid profile in cataract patients and healthy controls. **Method-** It was a prospective study. Data regarding various biochemical parameters were collected in cataract patients as case and compared with healthy persons as control. Analysis and comparison were done using Student 't' test and chi square test. **Result –** Serum Total cholesterol, Triglyceride, LDL higher in cataract patients as compare to healthy persons and significant lower value of HDL in cataract patients as compare to healthy persons. **Conclusion-** monitoring of serum levels of these parameters during the follow-up of cataract patients will be of great benefit. As cataract is one among the treatable causes of blindness, it is justifiable to make an attempt to identify a probable risk factor for the genesis and diagnosis of cataract.

INTRODUCTION

Cataract is a major cause of blindness and low vision worldwide. It is estimated that 44.1% of blind cases and 51.6% of patients with low vision have cataract (1). It is defined as a decrease in the transparency of the crystalline lens and can be further differentiated into nuclear, cortical, or posterior subcapsular cataract (PSC) (2)

Main risk factors in the developed world, besides advanced age, appear to be smoking, exposure to sunlight, and use of corticosteroids (3). A potential association between female gender and cataract remains controversial. The development of cataract is a complex, multifactorial process and several factors such as genes, gender, diabetes, geographic location, UV light exposure, Vitamin A, C, E deficiency, Severe diarrhoeal dehydration, level of education, occupational status and nutritional factors in the daily diet have been found to be associated with cataract formation.

Age is the most important risk factor and about 85 percent of involved patients have age-related cataract (4). This type of cataract is called "senile cataract". It is the main cause of blindness in patients over 45 years (5). It is estimated that a ten-year delay in the onset of cataracts could decrease the number of cataract surgeries by 45 percent, thus considerably diminishing care cost (6).

The surgical extraction of the cataract is performed when the disease leads to functional disorders. Patients with cataracts in low resource areas and developing countries have a decreased chance for surgery due to economic reasons. This results in an increased risk of blindness in such populations. In 1999 the World Health Organization (WHO) and the International Agency for the Prevention of Blindness (IAPB) launched a joint initiative known as 'VISION 2020:The Right to Sight' which aims to reduce preventable blindness by the year 2020(7)

AIMS & OBJECTIVES

The aim of this study was comparison of serum lipids profile in patients with cataract and healthy control as well as in a case-control Study.

METHOD

After took necessary permissions from The Ethical Committee, Research Review Board, Department of ophthalmology, study was conducted as below:

Study Area: The study was conducted in the Department of Biochemistry Central lab, S.M.S. Medical College and attached Hospitals, Jaipur in association with Department of ophthalmology of S.M.S. Hospital, Jaipur.

Study Type :A Hospital based Comparative analysis.

Study Design: A case control study.

Study Period: June 2021 to November 2023. Data collection was started after approval from institutional research review board till the desired sample size was achieved.

Sample Size: A sample of 72 case in each group was required at 95% confidence interval and power of 80% to verify expected difference of 17.8% in population (cataract as case and healthy as control).

INCLUSION CRITERIA

Individuals were attending the outpatient Department of Ophthalmology with suspected cataract. They were included in the study if they met the following inclusion criteria.

- Patients age group of 35 to 65 years.
- Patients with the cases consisted of consecutive cataract who attended the ophthalmology clinic of the hospital, the diagnosis of cataract was based on biomicroscope evaluation.
- The controls were age- and sex- matched companions of the patient or non-cataract patients who attended the hospital during the same period.
- Those who were willing to participate and give written informed consent for the study.

Exclusion criteria

- Patients with previous history and treatment of lipid abnormalities.
- Patients on lipid lowering treatments.
- Patients with any chronic and metabolic disease
- Patients with using steroid.

- Patients with Renal and Liver dysfunctions.
- Smokers and Alcoholics.

Principle assays

1. Triglyceride By GPO-POD enzymatic colorimetric assay.
2. Cholesterol by CHOD-POD enzymatic colorimetric assay.
3. HDL by cholesterol esterase, cholesterol oxidase and chromogen system.
4. LDL by Friedewald equation .

Result

The age group of subjects is between 35-60 years. As shown in table-1 mean age of cataract patients as case is 56.37±4.15 years and in controls 55.59±6.01 years. Age distribution in our study is statistically nonsignificant (p=0.366).

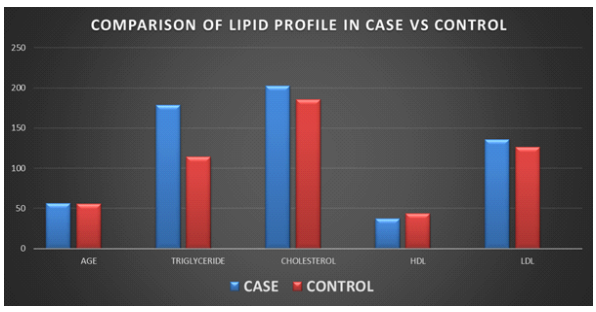
The mean Triglyceride level for cases 178.56±41.09 mg/dl and for controls 114.28±28.67mg/dl, value is statistically significant (p-value <0.001).

The mean Total cholesterol level for cases 202.61±32.64 mg/dl and for controls 185.84±33.79 mg /dl, value is statistically significant (p value = 0.002).
The mean HDL level for cases 37.30±4.06 mg/dl and for controls 43.68 ± 7.19mg/dl, value is statistically significant (p-value <0.001).

The mean LDL level for cases 135.93±26.87 mg/dl and for controls 126±31.58 mg/dl. The value is statistically significant (p-value 0.044.)

TABLE-1

PARAMETER	CASE (n=72)	CONTROL (n=72)	P-VALUE
AGE (years)	56.37±4.15	55.59±6.01	0.366
SERUM TRIGLYCERIDES (mg/dl)	178.56±41.09	114.28±28.67	<0.001 (s)
SERUM CHOLESTEROL (mg/dl)	202.61±32.64	185.84±33.79	0.002 (s)
SERUM HDL (mg/dl)	37.30±4.06	43.68 ± 7.19	<0.001 (s)
SERUM LDL (mg/dl)	135.93±26.87	126±31.58	0.044 (S)



DISCUSSION

Cataract is responsible for 50% of blindness in the world; the overall prevalence rate varies from 1 to 4% of the population. Cataract prevalence increases with age. As the world's population ages, cataract induced visual dysfunction and blindness is on increase. Cataract is a significant global problem of 21st century. For the importance of cataract, research for clarifying its etiology is a necessity, so that many future disabilities can be prevented, surgical costs reduced and quality of life improved. Senile cataract due to aging is more common than other types of cataracts. Most of the risk factors are mingled with other factors and leads to unavoidable progression of the disease. This present study is an attempt forward on series of previous studies done to study the pattern of biochemical abnormalities in Cataract. In this comparative study, we compared serum lipid profile in 72 cases of cataract with age matched healthy controls.

Our study shows higher level of total cholesterol, triglyceride, LDL in case as compare to control, and lower level of HDL in case as compare to control.

Study finding also correlated with study of Azim et al (8) done in 2018 In this study, TC, TAG, LDLC levels were significantly higher (P<0.001) and HDL-C level was significantly lower (P<0.001) in diagnosed senile cataract patients (DSC) as compared to non-cataract group (NCG) and give conclusion that dyslipidemia may act as risk factors for development of cataract.

SUMMARY & CONCLUSION

Our study found significant rise in Serum blood glucose, total cholesterol, triglyceride, LDL in case as compare to control and significant lower value of HDL in case as compare to control.

It has been shown that in our study cataract patients have high total cholesterol, triglyceride, LDL, and low HDL level. Hence monitoring of serum levels of these parameters during the follow-up of cataract patients will be of great benefit. There is a definite need to study and determine the role and to compare the relationship of these parameters in cataract etiology, diagnosis and in prognosis. As cataract is one among the treatable causes of blindness, it is justifiable to make an attempt to identify a probable risk factor for the genesis and diagnosis of cataract.

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