SERUM LIPID LEVELS IN DEPRESSION PATIENTS

Medicine	
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ABSTRACT

Background: Lower levels of circulating cholesterol is risk factor for depressive disorder. A reduced serum cholesterol level may be accompanied by changes in viscosity and function of serotonin receptors and transporter.

Materials and Methods: A total of 100 depressive patients and 100 healthy matched control subjects were recruited from mental hospital, Indore and lipid profile was measured.

Results: Depression Patient group has shown significantly less triglyceride and significantly more HDL-c than control group.

Conclusion: Lower levels of serum cholesterol are associated with depressive disorder.

KEYWORDS

Depression, Cholesterol, Lipids, Serotonin

INTRODUCTION

Cholesterol is a core component of the central nervous system (CNS), essential for the cell membrane stability and the correct functioning of neurotransmission (Ghaemi et al., 2000). It plays a crucial role in the second messenger systems of the brain that have been associated with the mechanism of action of antidepressant drugs and mood stabilizers and may be involved in the etiology and pathogenesis of mood disorders (De Berardis et al., 2008; Gambi et al., 2005). Several studies have shown that patients with major depression (MD) have lower total cholesterol (TC) levels than non- depressed individuals (Pankaja et al., 2012; Lindberg et al., 1994; Olusi and Fido, 1996; Morgan et al., 1993). In 1992 Engelberg, hypothesized that a reduced serum cholesterol level may be accompanied by changes in viscosity and function of serotonin receptors and transporters as well as by decreased serotonin precursors that may be the cause of depression (Engelberg et al., 1992).

AIM To compare lipid profile between depression patients and healthy controls.

METHODOLOGY: A total of 100 depressive patients(according to ICD-10 ,aged 18-60 years, drug naïve or drug free (for 3 months) and 100 healthy age and sex matched control subjects were recruited from mental hospital, indore. Patients with comorbid psychiatric illness , dyslipidemia, hypertension or endocrinological disorders were excluded. Blood samples were drawn after overnight fasting. Fully automated analysers were used for testing the blood samples. Plasma levels of total cholesterol (TC), triglycerides (TG), high-density lipoprotein cholesterol (HDL-c) were determined by enzymatic colorimetric methods (Enzymatic peroxidase colour test). GPO-PAP method using glycerol-3-phosphate oxidase was used for TG and CHOD-PAP method using cholesterol oxidase for TC.

For (HDL-c) selective detergent was used as endpoint accelerator. LDL-c was determined by Friedewald formula i.e (TC-HDL-[TG/5]). Patient group was assessed on HAM-D.

TABLE 1: Comparison Of Lipid Parameters Between Depression Patients And Healthy Controls.

Parameters	Depression Patients (Mean±SD) N=100	Healthy controls (Mean± SD) N=100	T	P
Total Cholesterol (mg/dl)	171.68± 51.48	163.80± 30.02	1.324	0.187
Triglycerides (mg/dl)	137.10± 79.02	157.43± 58.54	-2.067	**0.040***
HDL-c (mg/dl)	50.76± 45.37	39.20± 5.96	2.528	**0.012***
LDL-c(mg/dl)	109.33± 118.21	92.97± 22.64	1.360	0.176
VLDL-c (mg/dl)	34.17± 30.25	31.06± 12.98	0.945	0.346

*p<0.05; **p<0.01; ***p<0.001

TABLE 2: Correlation Between Lipid Levels And Clinical Scales Score (ham-d) In Depression Patients

	TC	TG	HDL-c	LDL-c	VLDL-c
HAM-D (N=100)					
r	**-0.331**	-0.021	-0.020	**-0.222**	-0.074
p	**0.001***	0.833	0.843	**0.027***	0.462

*p<0.05; **p<0.01; ***p<0.001

TABLE 3: Correlation Between Lipid Levels And Socio-demographic/clinical Variables In Depression Patients

N=100	TC	TG	HDL-c	LDL-c	VLDL-c
Age in years					
R	0.174	**0.238**	-0.077	-0.040	0.117
P	0.083	**0.017***	0.447	0.692	0.245
Age of onset of illness					
R	0.160	**0.241**	-0.078	-0.045	0.131
P	0.111	**0.016***	0.441	0.656	0.194
Duration of illness in months					
R	0.112	0.094	-0.050	-0.023	0.005
P	0.269	0.352	0.621	0.817	0.960

*p<0.05; **p<0.01; ***p<0.001

TABLE 4: Correlation Among Lipid Levels In Depression Patients.

N=100	TC	TG	HDL-c	LDL-c	VLDL-c
TC					
r	1				
p					
TG					
r	**0.408**	1			
p	**0.000***				
HDL-c					
r	0.151	**0.198**	1		
p	0.134	**0.049***			
LDL-c					
r	**0.244**	-0.010	0.003	1	
p	**0.015***	0.920	0.980		
VLDL-c					
r	-0.090	**0.385**	0.101	-0.063	1
p	0.373	**0.000***	0.318	0.532	

*p<0.05; **p<0.01; ***p<0.001

RESULTS

1. Depression Patient group has shown significantly less Triglyceride and significantly more HDL-c than control group.

2. In depression patients, TG has a significant positive correlation with age of the patient (in years) and age of onset of illness (in months).

3. In depression patients, LDL-c and TC level has significant negative correlation with HAM-D score.

4. In depression patients, Total Cholesterol has significant positive correlation with Triglyceride. Triglyceride has significant positive correlation with HDL-c. Total Cholesterol has significant positive correlation with LDL-c. Triglyceride has significant positive correlation with VLDL-c.

DISCUSSION

On comparing the lipid parameters i.e HDL, LDL, VLDL, total TG, total cholesterol, between depression patient and control group, there were no statistically significant difference between patient and control group in respect to VLDL level, LDL level and Total Cholesterol Level. Depression Patient group has shown significantly less triglyceride and significantly more HDL-c than control group. The finding of less TG in this study is consistent with the studies (pankaja et al., 2012; Lindberg et al., 1994).

Pankaja et al compared lipid profile in 50 major depressive disorder and 50 normal healthy control subjects and concluded that Serum total cholesterol, serum triglyceride and HDL-cholesterol levels were significantly decreased in patients with major depressive disorder (pankaja et al., 2012).

In a cross sectional study of male and female employees in Sweden, total cholesterol and LDL cholesterol values were inversely correlated with the frequency of low mood in men expressed in a questionnaire Serum triglyceride concentrations did not differ. In women, however, the serum triglyceride value, but not the total cholesterol or LDL cholesterol, was lower in those who reported low mood, depression and anxiety during the past six months. (Lindberg, et al., 1994).

An Indian study at AIIMS on 30 depressive patients and 30 healthy matched controls concluded that the serum TC and LDL-cholesterol levels were found to be significantly lower in study group than that of control group . There was no significance difference in HDL cholesterol and TG levels between study group and control group (Patra et al., 2014). The finding of this study was different from the current study.The difference in sample size (i.e. 100 depressive patients and 100 healthy controls in current study) might be one of the reasons for the difference in result.

On seeing correlation between lipid parameters and HAM-D, scores in depression patients, LDL-c and TC level has significant negative correlation with HAM-D score i.e lower LDL-c and TC are associated with higher scores i.e severe depression. This finding is consistent with the study (Rabe-Jabłońska & Poprawska, 2000).

LIMITATIONS

There is lack of longitudinal follow-up.
There is lack of assessment of the effect of lifestyle factors, physical activity, dietary factors all of which can confound the lipid levels. Baseline assessment was not matched.

CONCLUSION

Depression patients have lower lipid levels as compared to healthy controls. Thus lipid levels can serve as potential biomarker for depression.

Further study needs to be done to substantiate the role of lipid as a potential biomarker.

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