Comparative Study of Lipid Profile in Women Newly Diagnosed With Depression & In Normal Healthy Women

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Introduction: *Depression is known to mankind since many years. The World Health Organization has ranked depression fourth in a list most urgent health issues worldwide [1]. It is projected that depression will be second largest killer disease after heart disease by 2020 and second major leading cause of Disability Adjusted Life Years(DALYS)[1].*

Etiology of depression, among mood disorders is although most frequently studied, yet it is far away from ideally understood. Increased activity in the Hypothalamo-pituitary-Adrenal (HPA) axis leads to depression and it is viewed as the "most vulnerable finding in biological psychiatry".

Depression leads to state of constant stress and which usually leads to activation of HPA axis this in turn may lead to metabolic disturbances[8]. The correlation between the serum lipids and depression is debatable. Many attempts have been done to find out the correlation of dyslipidemia's with depression.

Objectives: *Major depressive disorder (MDD) has been associated with significant changes in hypothalamo-pituitary-adrenal axis. Depression leads to a state of constant stress and it leads to activation of HPA axis which in turn leads to metabolic disturbances, like dyslipidemias. Correlation of serum lipids with depression is debatable, so this study is to evaluate serum lipid profile in women newly diagnosed with depression compared with age matched healthy women.*

Materials and Methods: *Two groups of subjects group 1(cases) includes females in the age group of 18-50 years newly diagnosed with depression and group 2 (controls) includes normal healthy females in the age group of 18-50 years. Blood samples were collected from both the groups separated serum was used for the estimation of lipid profie (total cholesterol,TG,LDL,VLDL,HDL) by using semi auto analyser.*

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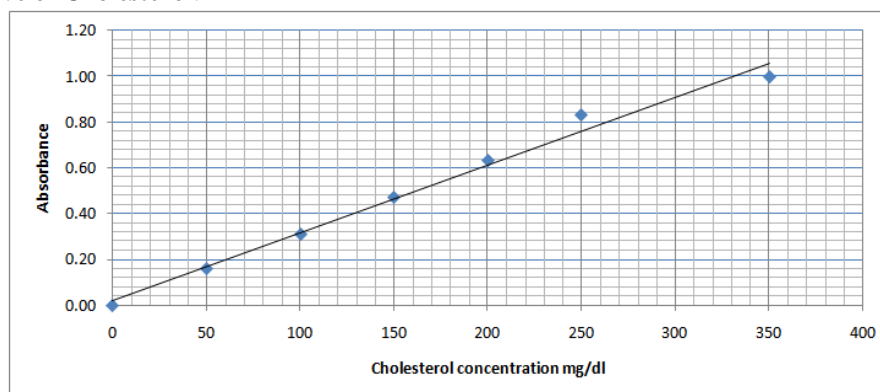---

Determination of Serum Total Cholesterol

Method: Cholesterol oxidase - peroxidase
Sample: serum (free of hemolysis)
Standard curve of Cholesterol:

X-axis: cholesterol concentrations & Y-axis: Absorbance
Reference values:

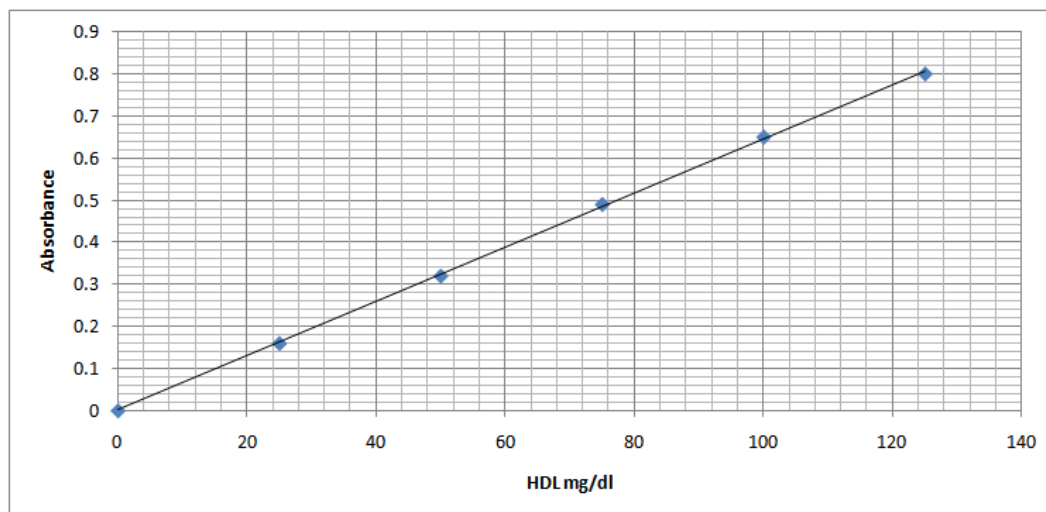-   < 200   :   Desirable
-     200 – 239   :   Border line high
-     ≥ 240   :   High

Determination of HDL- Cholesterol

Methodology   :   Phosphotungstate method
HDL cholesterol Standard concentration: 25 mg/dL
Standard curve:

Sample:
 Serum (free of hemolysis).
Reference range

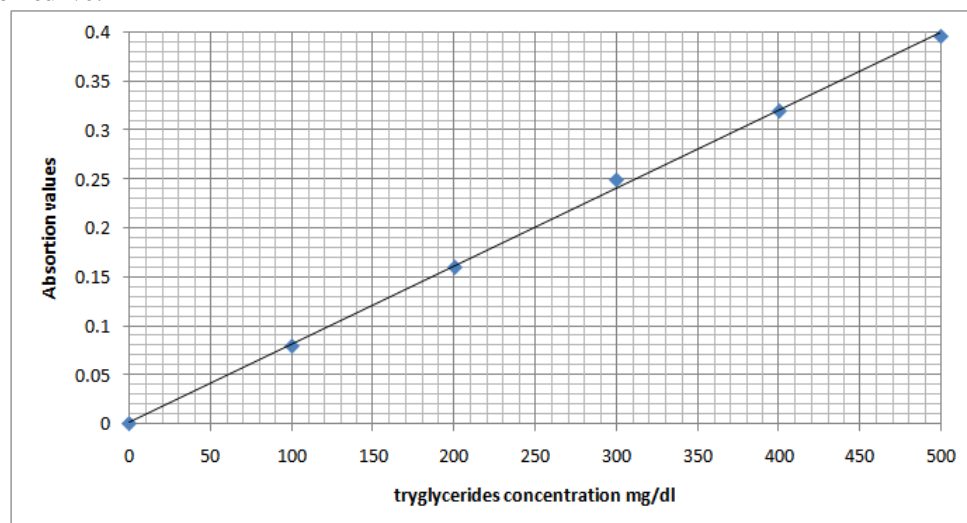   < 40 mg/dL   :   Low
      ε 60 mg/dL   :   High

DETERMINATION OF TRIGLYCERIDES

Method: GPO-PAP methodology. (Including LCF-lipemic clearing factor)
Calibration curve:

Males: 40-160 mg/dL, females: 35-135 mg/Dl

< 150   :   Optimal
151 – 199   :   Border line high
200– 499   :   High
>500   :   Very high

DETERMINATION OF LDL and VLDL CHOLESTEROL

LDL – Cholesterol is calculated by FRIEDEWALDS formula.
LDL-Cholesterol = Total cholesterol – (HDL + VLDL).

Classification of LDL-C (mg/dl) :

< 70	Therapeutic option for high risk patients
< 100	Optimal
100 – 129	above optimal
130 – 159	Borderline high
160 – 189	High
> 190	Very high

Inclusion criteria: Newly diagnosed female subjects with depression in the age group between 18-50, satisfying ICD10 criteria who have given informed written consent.

Exclusion Criteria: Known cases of Diabetes / Hypertension / Alcoholism / Epilepsy.Patients on medication which can affect the levels of thyroid hormones. (steroids and anti-epileptics)**,** Pregnant and lactating women, Psychiatric illness that mimic depression (ADHD, bipolar disorder, anxiety, PTSD, chronic fatigue syndrome)

I. Results:

Total cholesterol:

In the present study the mean value of serum total cholesterol level in group-1 is 166.9 +/-34.5 mg/dl and in group-2 the mean value is184.6 +/-38.3 and P value is 0.0170 which is   statistically significant. In group-1 the serum value of total cholesterol is significantly decreased   compared to group-2.

Table-11: Mean +/- SD of Total cholesterol levels in two groups

S.NO	Group	Mean+/-SD	P value
1	Group 1	166.9 +/-34.5 mg/dl	
2	Group 2	184.6 +/- 38.3 mg/dl	0.0170 (significant)

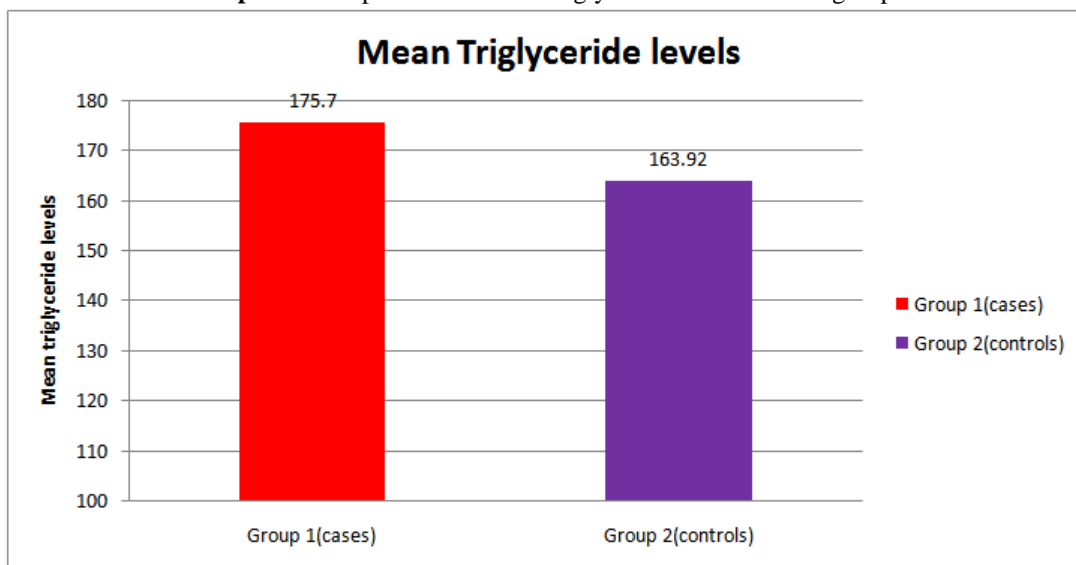**Graph-5:** Comparison of mean Total cholesterol levels in two groups
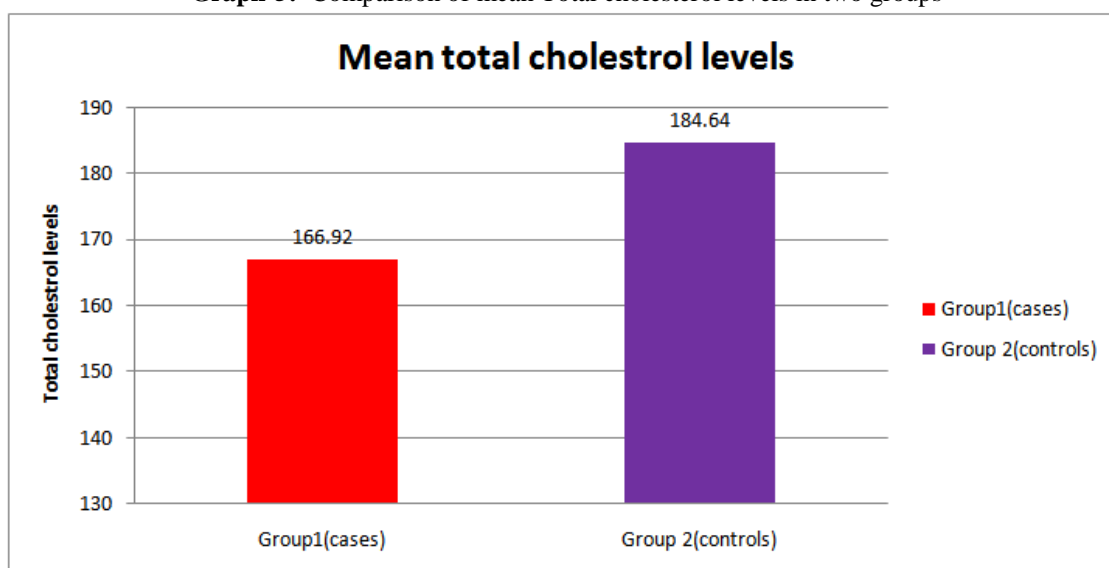
Triglycerides:

In the present study the mean value of serum triglycerides level in group-1 is 175.7 +/- 47.3 mg/dl and in group-2 the mean value is 163.9 +/- 33.6 mg/dl. P value is 0.1799 which is statistically significant. In group-1 the serum value of triglycerides is mild increase in cases compared to group-2

Table-12: Mean +/- SD of Triglycerides levels in two groups

S.NO	Group	Mean+/-SD	P value
1	Group 1	175.7+/- 47.3mg/dl	0.1799
2	Group 2	163.9+/- 33.6 mg/dl	(not significant)

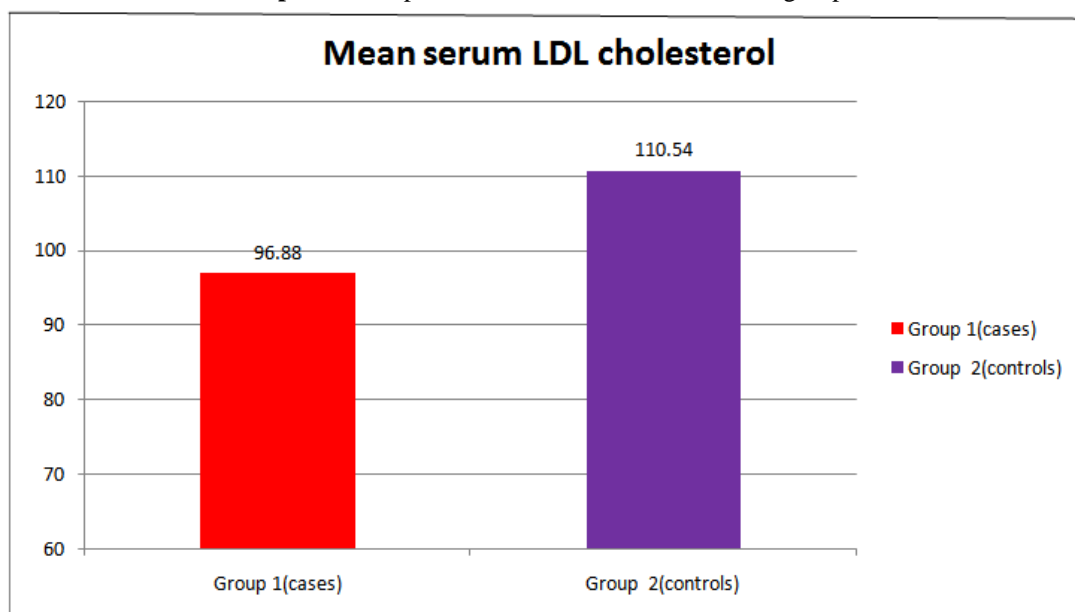**Graph-4**: Comparison of mean Triglycerides levels in two groups

LDL cholesterol:

In the present study the mean value of serum LDL cholesterol level in group-1 is 96.9+/-36.2 mg/dl and in group-2 the mean value is110.5+/-32.4 mg/dl and   P value is 0.0497 which is statistically significant. In group-1 there is significant decrease in the LDL cholesterol level compared to group-2.

Table-13:   Mean +/- SD of LDL levels in two groups

S.no	groups	Mean +/- SD	P value
1	Group 1	96.9+/-36.2 mg/dl	
2	Group 2	110.5+/-32.4 mg/dl	0.0497 (significant)

**Graph-6:** Comparison of mean LDL levels in two groups.

HDL cholesterol:

In the present study the mean value of serum HDL cholesterol level in group-1 is 43.1+/-6.4 mg/dl and in group-2 the mean value is 44.9+/-7.8 mg/dl. P value is 0.2215 which is not statistically significant. In group-1 there is mild decrease of serum HDL level when compared to group-2.

Table-14: Mean+/- SD of HDL levels in two groups

S.NO	Group	Mean+/-SD	P value
1	Group 1	43.1 +/- 6.4 mg/dl	
2	Group 2	44.8 +/- 7.8 mg/dl	0.22215 (not significant)

**Graph-7:** Comparison of mean HDL levels in two groups.
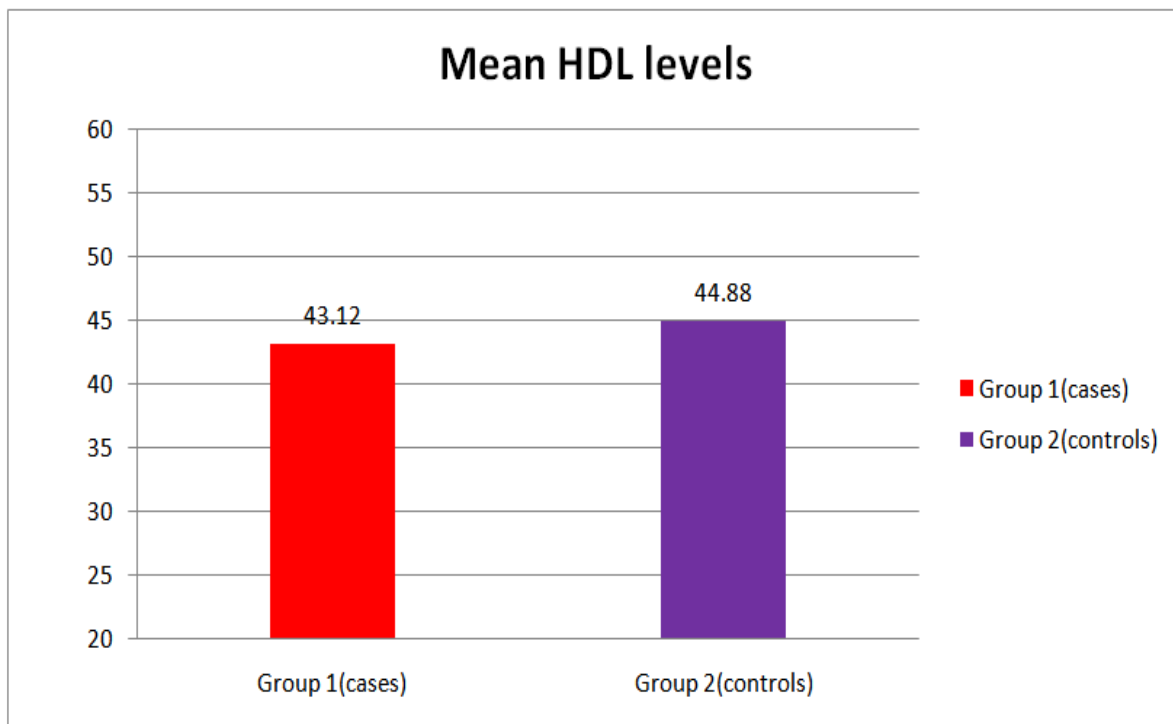
VLDL:

The mean value of serum VLDL in group-1 is 35.1+/-9.4 mg/dl and in group-2 the mean value is 32.6+/-7.4 mg/dl, p value is 0.1425 which is not statistically significant. VLDL value is mild increase in group-1when compared to group-2.

Table-15: Mean +/- SD of VLDL levels in two groups

s.no	group	Mean+/-SD	P value
1.	Group-1	35.1 +/- 9.4mg/dl	0.1425 (not significant)
2.	Group-2	32.6 +/- 7.4 mg/dl	

Graph-8: Comparison of mean VLDL levels in two groups.

serum VLDL levels(mg/dl)

Group 1(cases) 35.08
Group 2(controls) 32.58
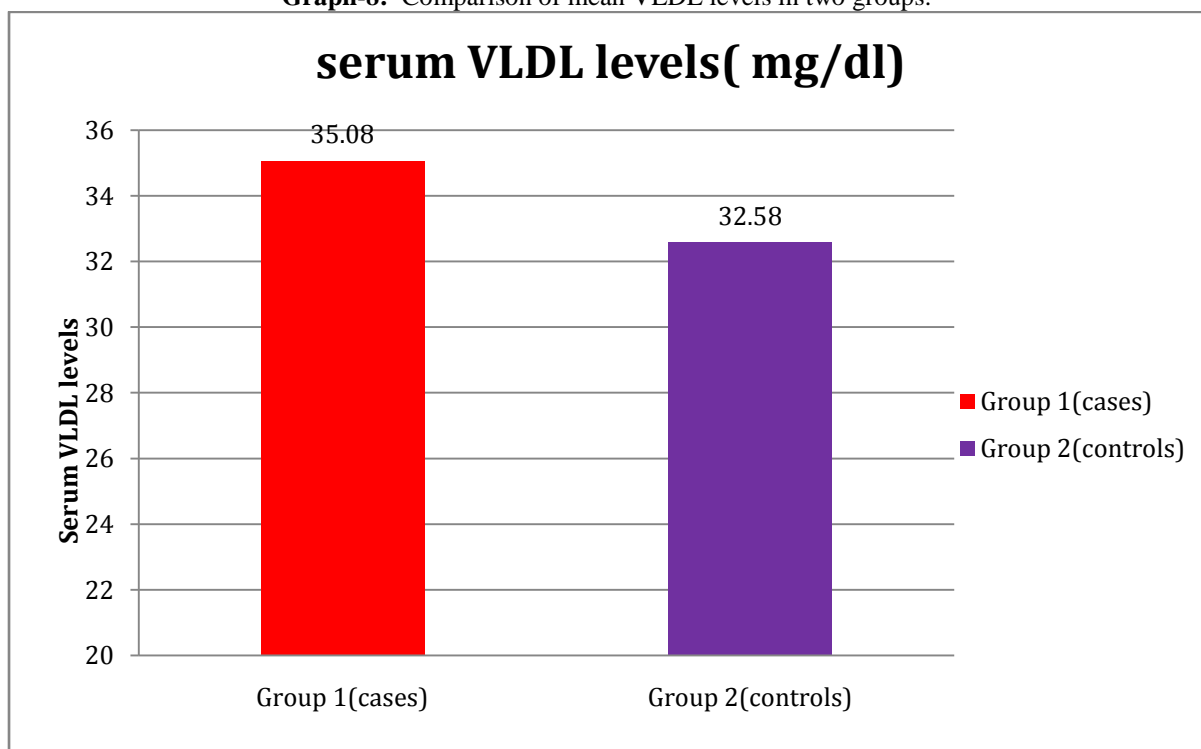
Lipid Profile

Analyte	Cases	Controls	P-Value
Total Cholesterol	166.9+/-34.5mg/dl	184.6+/-38.3 mg/dl	**0.0170**
Triglycerides	175.7+/-47.3 mg/dl	163.9+/-33.6 mg/dl	0.1799
HDL	43.1+/-6.4 mg/dl	44.8+/-7.8 mg/dl	0.2215
LDL	96.9+/-36.2 mg/dl	110.5+/-32.4 mg/dl	**0.0497**
VLDL	35.1+/-9.4 mg/dl	32.6+/-7.4 mg/dl	0.1425

II. Summary

Mean value of serum total cholesterol in group 1 is 166.9+/-34.5 mg/dl and in group 2 184.6+/-38.3 mg/dl and p value is 0.0170 which is statistically significant. Mean value of serum triglycerides in group 1 is 175.7+/-47.3mg/dl and in group 2 is 163.9+/-33.6 mg/dl and p value is 0.1799 which is not statistically significant. Mean value of serum LDL cholesterol in group 1 is 96.9+/-36.2 mg/dl and in group 2 is 110.5+/-32.4 mg/dl and p value is 0.0497 which is statistically significant. Mean value of serum HDL cholesterol is 43.1+/-6.4 mg/dl and in group 2 is 44.8+/-7.8 mg/dl and p value is 0.2215 which is not statistically significant. Mean value of serum VLDL cholesterol in group 1 is 35.1+/-8.2 mg/dl and in group 2 is32.6+/-7.4 mg/dl and p value is 0.1425 which is not statistically significant.

III. Discussion

Study was conducted by dividing the study subjects in to two groups group 1-includes women with depression fulfilling ICD 10 criteria and group 2- includes women without depression.
Serum lipid profile
● Triglycerides
● Total cholesterol
● LDL cholesterol
● HDL cholesterol
● VLDL

Depression is a important disorder of public health importance, related to its prevalence, the suffering, dysfunction, morbidity, and economic burden on the society. Depression in females is more common than males. The reports on overall burden of disease estimates the point prevalence of unipolar depressive episodes to be 1.9% for men and 3.2% for women, and the one-year prevalence has been estimated to be 5.8% for men and 9.5% for women. It is estimated that by the year 2020 ,the burden of depression will increase to 5.7% of the total burden of psychiatric disorders and it would be the second leading cause of disability-adjusted life years (DALYs)[91].

Diagnostic criteria for depression ICD-10 are used as an agreed list of ten depressive symptoms[95]
Key symptoms:
● persistent sadness or low mood   (and/or)
● loss of interests or pleasure
● fatigue or low energy

The risk factors that are predisposed to depression are:
● Abuse
● Certain medications
● Conflict
● Death or a loss
● Genetics
● Major events
● Serious illnesses
● Substance abuse
● Other personal problems

Since long it has been observed that total cholesterol levels are consistently lower in more severely depressed and more aggressive patients. Because of this observations it has been suggested that total cholesterol levels might be a clinically significant biological marker for evaluating the risk of suicide and that it may be of prognostic value in managing depressive patients.

Further it is also found that low lipid levels are associated with persistently low platelet serotonin levels in depressed suicidal patients. It's has been hypothesized that low cholesterol levels indirectly lead to reduced brain serotonin levels because of the requirement of adequate cholesterol in nerve cell membranes to maintain the functional integrity of serotonin receptors. Hence serotonin plays vital role as inhibitor of depression. Low levels of serotonin could induce depression. Estimation of total cholesterol, low LDL-C may be helpful in determining suicidality among depressed patients.

Other perspective of depression is a state of constant stress; which leads to activation of HPA axis ,leads to high cortisol this in turn leads to DYSLIPIDEMIA'S.

IV. Conclusion
In the present study there is significant change in some of the lipid parameters we found that HPA (Hypothalamo pituitary adrenal axis) plays vital role in mood disorders. Excess of cortisol due to various reasons may be the root cause of mood disorders (depression).

Hence this study may be useful in understanding the risk factors of depression and this forms a area for the reasearch work which if detected early can be managed accordingly and may prevent the morbidity and mortality due to mood disorders like depression.

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