# PREDILECTION OF DEPRESSIVE DISORDER WITH IMMUNOLOGICAL AND BIOCHEMICAL MARKERS

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**ABSTRACT**

**Background:** Depression is one of the most common mental disorders but serious illness. It started when you are a teen or child but it can happen at any age. Depressed people can feel sad, anxious, empty, hopeless, worried , helpless, worthless, guilty, alone, irritable, hurt, or restless. Recent investigations reveal that cytokines are involved in not only inflammatory and infections CNS disease but also in the neurodegenerative diseases and in functional psychosis. **Material and Method:** Type of study: This was a cross sectional, observational, descriptive-analytic study Place of study: The study was conducted in a Tertiary Care Teaching Hospital Duration of study: 12 months, Sample size: 150, Total 150 participants were selected from both genders ranging in age between 20 to 60 years who were attending psychiatric O.P.D at tertiary health care Hospital, 50 control subjects were selected. Procedure: Approval from Institutional Ethics Committee was taken before starting the study. The study was explained to them in brief in a language they can understand. Consent of participants was taken in written informed consent form. All data collected were analyzed using appropriate statistical tests. **Result:** Analysis for comparison of means of clinical characteristics and laboratory parameters of patients revealed that association between depression disorder and IL-6,serum total cholesterol, serum-LDL and triglyceride was statistically significant ($p<0.005$)and there is some definite relationship between serum IL-6 , lipid profile and development of depression disorder.

**Keyword:** Depression, Lipid profile, Interlukin-6, magnesium.

## INTRODUCTION

Depression is a mood disorder that causes persistent feelings of sadness, low mood & enjoyment, loss of interest and reduced energy. Depression is not a weakness. Which often impair day to day functioning? Depression affects how people feel about themselves, behave and thinks and can lead to a variety of emotional and physical problems. Depression illness is disorder of the brain. In adult life they are perceived as stressful may trigger psychiatric illness. It is not known exactly what causes depression as with the mental disorders, a variety of factors may be involved, such as biological difference, brain chemistry**,** environmental, Hormones, Inherited traits**,** combination of genetics

Depression is one of the most common mental disorders but serious illness. It started when you are a teen or child but it can happen at any age. Depressed people can feel sad, anxious, empty, hopeless, worried, helpless, worthless, guilty, alone,

irritable, hurt, or restless. Recent investigations reveal that cytokines are involved in not only inflammatory and infections CNS disease but also in the neurodegenerative diseases and in functional psychosis **(1)**

IL-6 is an important biochemical marker involved in the wide range in depressive disorders. The name "interleukin" was chosen in 1979, to replace the various different names used by different research groups to designate interleukin-1 (lymphocyte activating factor, mitogenic protein, T-cell replacing factor III, B-cell activating factor, B-cell differentiation factor, and "Heidikine"). The abnormal production of IL-6 was first suggested to be related to polyclonal B-cell activation with auto-antibody production in patients with cardiac myxoma. Since then, il-6 has been suggested to be involved in the pathogenesis of a variety of disease **(2)**.

Psychiatric disorders are closely associated with abnormal lipid metabolism. Composition of serum lipid is characteristically altered in patients of psychiatric illnesses associated with higher risk of coronary heart disease (CHD).Psychiatric patients tend to have increased triglyceride and LDL-Ch levels along with reduced HDL-Ch levels as compared to non-psychiatric patients and this is associated with higher risk of CHD in them. High levels of HDL-C can lower an individual's risk of developing heart disease. If HDL-C accounts for 20% of an individual's total cholesterol then the risk of developing heart disease is less than average.HDL fraction - is significantly lower in many patients with major depressive disorder than in non-depressed individuals, and that clinical improvement following antidepressant therapy is often associated with a significant increase in serum total cholesterol

Psychiatric disorders are closely associated with abnormal lipid metabolism. **(3)** The pattern of dietary intake in general population often deficient in many nutrients, especially vitamins, minerals, and essential fatty acids. Nutritional supplement/treatment is an emerging effective therapeutic intervention which may be appropriate for controlling and to some extent in reducing patients' symptoms. This nutritional supplement/therapy often useful in preventing depression, **(4)**

.There has been very few studies in which serum Mg levels in patients with mood disorders in various disease phases were compared. Some reported that the greater the disease severity assessed according to the depression rating scale, the higher the plasma and erythrocyte Mg levels.

The survey of literature also revealed that very few studies have been carried out so far and that too, no study has ever under taken in Rajasthan , therefore the present study was undertaken to study the relationship of IL-6 and the lipid profile as well as magnesium levels in the patients having depression and depression disorder.

**METHODOLOGY:**

Total 150 participants were selected from both genders ranging in age between 20 to 60 years who were attending psychiatric O.P.D and 50 control subjects were selected. The selected subjects were further grouped as –

***Group-1:*** Study group were consisted of control subjects (n=50) by routine examination, we ensured that all the subjects were healthy and with no signs & symptoms.

***Group-2 :*** Study group were consisted of patients with Depression disorders (n=100) who are diagnosed clinically by psychiatrist.

***Inclusion criteria***: depressive subjects those attending Psychiatric O.P.D of our hospital (20-60 yrs.) ***Exclusion criteria:*** Patients undergoing treatment of any other hypertension, diabetes, cardiovascular disorders documented by physical & clinical examination.

Serum was separated & kept frozen at -20$^{\circ}$C until assayed. Serum magnesium and lipid profile was measured on fully automated chemistry analyzer. The IL-6 levels were measured by using ELISA method.

Approval from Institutional Ethics Committee was taken before starting the study. Patients attending the out-patient department of hospital were randomly contacted personally. The study was explained to them in brief in a language they can understand. Consent of participants was taken in written informed consent form. All data collected were analyzed using appropriate statistical tests.

## RESULT:

We have studied 100 patients with depression disorder between 16-65 ages and sex matched healthy controls between 20-55 years. Out of 100 patients there were 65 males and 35 females .The mean age of patients were 35.4±8.96, n=100 whereas in controls 33.7±8.35n=50.

To find out any association between depression disorder and various independent variables, comparison of mean was done using uni-variate analysis with presence/ absence of depression disorder.

Students "t-test was used to compare the mean and p-value was calculated, p-value <0.005 was considered as statistically significant.

Analysis for comparison of means of clinical characteristics and laboratory parameters of patients revealed that association between depression disorder and IL-6,serum total cholesterol, serum-LDL and triglyceride was statistically significant (p<0.005)

While other parameter such as age and serum-HDL values were not significantly development of depression disorder.

## DISCUSSION:

Yektadowlati et al. (2010) reported that significantly higher concentrations of the pro-inflammatory cytokines IL-6 in depressed subjects compared with control subjects. In our study we concluded that serum concentration of il-6 (Pg/ml) was significantly higher in cases as compared to healthy controls (p=0.0001). The Mean±SD of il-6 in depression disorder patients was 4.27±1.38, while in control group it was 1.95±0.36.

**Table no. –1 Association of various clinical characteristic and laboratory parameter with depression disorder**.

| Character | Total study participants (n=100) | | Total control group (n=50) | | p-value |
|---|---|---|---|---|---|
| | mean | SD | Mean | SD | |
| **Age** | 35.42 | 8.99 | 33.3 | 8.46 | 0.646 |
| **Total cholesterol (mg/dl)** | 199.83 | 51.43 | 182.3 | 35.76 | 0.005 |
| **HDL (mg/dl)** | 41.97 | 16.50 | 51.3 | 13.08 | 0.160 |
| **LDL (mg/dl)** | 128.38 | 40.27 | 121.92 | 25.69 | 0.0007 |
| **Triglyceride (mg/dl)** | 229.72 | 48.16 | 154.70 | 24.45 | <0.0001 |
| **IL-6 (pg/ml)** | 4.24 | 1.37 | 2.02 | 0.43 | <0.0001 |
| **Serum magnesium** | 2.7 | 0.3 | 2.1 | 0.1 | < 0.0001 |

The Mean±SD of subjects in cases of cholesterol (mg/dl) came to be 200.2±51.41 and that of control group was 185.3±37.32 which was statistically significant (p=0.005).Chen et al, 2000 showed that the Mean total cholesterol was elevated (Shizuka and Yambe, 2001) in depression.

In our study the level LDL-C (mg/dl) was higher in depression disorder patients and found the value of LDL-C was 128.3±40.38 is compared to 118.6±29.65 in control group. Therefore the rise LDL-C level was

statistically significant (p=0.0007). Hemingway et al. (1999) Psychiatric patients tend to have increased triglyceride and LDL-C levels along with reduced HDL-C levels as compared to non-psychiatric patients and this is associated with higher risk of CHD in them.

In our study the Serum HDL-C (mg/dl) level was decrease in depression disorder patients and values of HDL-C 42.2±16.45 as compared to 50.8±15.38 in control group. Therefore the difference among cases and control was not statistical significant (p=0.160)

In our study the level Triglyceride (mg/dl) was higher in depression disorder patients and found the value of triglyceride was 230.0±47.87 is compared to 154.7±24.53 in control group. Therefore the rise Triglyceride level was statistically significant (p=0.0001).Fowkes et al, 1992 concluded change in lipid profile is the significant increase in plasma triglyceride in depression. The possible role of triglyceride metabolism in the etiology of depression is largely unknown but in an earlier study indicated a positive relationship between serum circulating triglyceride concentration and personality trait in depression. Similarly, a previous study (Rogers et al, 1989) had reported that hyper-triglyceridemia is associated with dementia especially in young subjects

## CONCLUSION

All groups were compared with controls, a significant difference was noticed in intrelukin-6, total cholesterol, triglyceride and LDL-C. Therefore, from this study it was concluded that, there is a definite relationship serum IL-6 & lipid profile in the depression disorder.

**Conflict of interest**: Nil

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