

Evaluation of serum albumin in patients with mood disorders

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Background and objectives: Recent studies have reported decreased levels of serum albumin in patients of mood disorders such as depression in western countries and some Asian population. Similar studies involving Indian population are not found. Hence, this study was designed to evaluate the evaluation of serum albumin in the patients with mood disorders.

Material and methods: The medical record charts of the patients with mood disorders were evaluated. The study included 234 patients of mood disorders (with or without suicide attempts) who attended the psychiatric department of SCB Medical College, Cuttack, Odisha, India. The data evaluated included age, body mass index, various biochemical parameters. This was compared with the healthy volunteers from the patient attendants. The study included an equal number of age and sex matched controls. Statistical analysis was done by SPSS version 19.

Results: we observed a significantly low level of serum albumin in patients with severe maniac depression as compared to controls ($2.12 \pm 0.09\text{g/L}$ vs $3.5 \pm 0.82\text{g/L}$). The level of serum albumin was low in major depression but not statistically significant. The difference in serum albumin levels lower in patients who attempted suicide as compared to those who didn't but not significant.

Conclusion: a low level of serum albumin is observed in the acute phase of depression and mood disorders in this population.

Keywords: albumin, depression, mood disorders, suicide

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I. Introduction

The serum albumin concentration is usually associated with nutritional wellbeing. Low levels of serum albumin is found in recurrent infection, surgery and malignancy (1-3). Serum albumin level is influenced by the circulating plasma, lymphatics, hepatic and renal functions (4-5). Various recent studies have implicated the association of low serum albumin in inflammation and depression (7,8,9). Serum albumin is a negative phase protein i.e. it decreases during acute inflammation. Recent studies have reported that mood disorders and depression. The studies have reported a lower level of serum albumin in depression patients in Western countries (10 -15). There is no such data for the Indian population.

Albumin is the most abundant protein in the plasma and is synthesized by the liver. It is the major contributor to oncotic pressure of plasma. It transports hormones, fatty acids, bilirubin, metals, ions and drugs. It also affects platelet function. The half-life of albumin is 21 days with an approximate degradation of about 4%/day. Decreased serum albumin is observed in conditions such as nephrotic syndrome, liver cirrhosis, cardiac failure, malnutrition and inflammation (14-16). Studies have implied that albumin may act as an antioxidant and modulate the inflammatory process in depression (17). Hence, the level of serum albumin needs to be evaluated in psychiatric patients. This study was designed to estimate the level of serum albumin in patients with mood disorders and depression in the patients (with and without suicide attempts) attending the department of psychiatry.

II. Material and methods

Study design and sample collection

All the patients attending the outpatient department of psychiatry, SCB Medical College were included in the study. This study was conducted for one year period i.e. from January 2017 to December 2017. This is a retrospective study and the medical records of the patients were evaluated. The medical record charts of the patients with mood disorders were evaluated. The study included 234 patients of mood disorders (with or without suicide attempts) who attended the psychiatric department of SCB Medical College, Cuttack, Odisha, India. The data evaluated included age, body mass index, various biochemical parameters. The patients with other co-morbid conditions as per DSM-III R criteria were excluded. The biochemical parameters included were fasting blood sugar, serum electrolytes, serum urea, creatinine, albumin and alanine aminotransferase. A

complete blood count was also done. This was compared with the healthy volunteers from the patient attendants. The study included an equal number of age and sex matched controls. Statistical analysis was done by SPSS version 19. All the data is represented as mean \pm standard deviation. The data was compared by coefficient of variation analysis (ANOVA). A p value less than 0.5 was considered significant.

III. Results

This study included 234 psychiatric patients out of which 116 suffered from schizophrenia, 64 patients from mood disorders, 9 from organic diseases, 11 patients from delusion and 34 from other disorders. The study population also included 10 drug-dependent and 18 had history of alcoholism. Out of the 64 patients of mood disorders 38 patients had major depression (7 patients had history of suicide attempt) and 26 suffered from mania.

Table 1 shows the comparison of demographic and biochemical parameters among psychiatric patients and controls. We observed a significantly lower level of serum albumin in the patients as compared to the controls. There was difference of serum albumin in the mania depression than in major depression patients but not statistically significant. There was no significant difference in the serum albumin in the patients with history of suicide attempt and those without as per ANOVA analysis (F=2.2, p=0.12).

Table 1 Comparison of demographic and biochemical parameters in the patients and controls

Parameter	Maniac depression	Major depression	Healthy volunteers (controls)
Age (yrs)	38.7 \pm 10.89	42 \pm 6.2	40.4 \pm 5.4
Body mass index (kg/m ²)	23.8 \pm 4.6	24.1 \pm 4.0	23.1 \pm 4.6
Serum albumin (g/dl)	2.9 \pm 0.68*	3.0 \pm 0.8	4.4 \pm 0.2

All data is represented as mean \pm standard deviation. * indicates a significance difference with the controls.

IV. Discussion

In this retrospective study we observed that patients with mood disorders have lower serum albumin than healthy volunteers. This is similar to the studies on western population. This also indicates that mania and major depression might be associated with acute-phase response and immunological alterations (7-12).

The study by Gabay and Kushner listed certain diseases that are usually associated with alterations in serum protein concentrations in acute phase response. These include infections, surgeries, injuries and trauma, burns, infarction and cancer (19). The serum albumin changes moderately after vigorous and strenuous exercise, heat stroke and during post-partum period (20, 21). Smaller alterations occur in cases of psychological stress and psychiatric diseases (21, 22). We found there is no significant difference in serum albumin concentration in patients with history of suicide attempts and those without such attempts. Recent research on rats have suggested that continuous infusion of albumin reduces depression and prevents epileptogenesis (23). Since this is a retrospective study we could not compare and evaluate the nutritional status with the severity of depression. The studies on western population have reported a negative correlation of serum albumin level with the severity of major depression but no such finding was observed in mania cases. They have also observed low levels of serum albumin in treatment resistant depression but in our study no such finding was observed (23).

23. SedaSalar, EzequielLapilover, JuliaMüller, Jan-OliverHollnagel, KristinaLippmann, AlonFriedman. Synaptic plasticity in area CA1 of rat hippocampal slices following intraventricular application of albumin. *Neurobiology of disease*, Volume 91, July 2016, Pages 155-165

Due to the retrospective nature of this study, severity ratings and nutritional conditions were not available for analysis. The records of intake and course of illness after the first episode were not complete and were therefore not included in this analysis. There have been reports showing a significant negative correlation between albumin concentrations and severity of illness (10) and lower albumin levels in patients with treatment-resistant depression in Western countries (23). However, no discussions about the serum albumin levels and patients with mania

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