

# Study of Relationship between Dissociative Disorders and Vitamin-C Status in Rural Subjects of Western Uttar Pradesh

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**Abstract:** ***Aim & Objective:** To study vitamin C status of rural dissociative disorders population of western U.P. vis-a-vis age and sex matched healthy controls. **Materials & Methods:** From patients visiting the Psychiatric department of TMMC & RC, thirty dissociative patients, diagnosed according to Structured Clinical Interview DSM-IV-TR schedule, were selected randomly and their serum vitamin C levels were measured by dinitrophenyl hydrazine method. These levels were compared with 30 age-and sex-matched healthy controls. **Results:** Mean ( $\pm$ SD) serum vitamin C level of dissociative patients and controls were  $0.29\pm 0.16$  mg/dl and SD  $0.39\pm 0.17$  mg/dl respectively. The difference between these two groups of subjects was statistically significant ( $p$  value  $< 0.01$ ). **Conclusion:** This study shows low vitamin C status in dissociative patients as compared to normal individuals, and suggests that vitamin C supplementation can have a positive effect in the treatment of these patients.*

**Keyword:** vitamin C, dissociative disorders

## 1. Introduction

Dissociative disorders are a group of psychiatric syndromes characterized by disruptions of aspects of consciousness, identity, memory, motor behaviour, or environmental awareness. The American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR)* includes 4 dissociative disorders and one category for atypical dissociative disorders. These include;

- Dissociative amnesia (DA)
- Dissociative identity disorder (DID)
- Dissociative fugue
- Depersonalization disorder
- Dissociative disorders not otherwise specified (DDNOS).<sup>(1)</sup>

Several neurotransmitter systems have been implicated in the development of dissociative disorders

**Norepinephrine** acts as neurotransmitters and also as a hormone. It acts as neurotransmitter, regulating normal brain process. Norepinephrine is usually excitatory, but is inhibitory in a few brain areas.<sup>(2)</sup>

**Dopamine** correlated with movement, attention, and learning.

- Too much dopamine has been associated with schizophrenia.
- Too little is associated with some form of depression, muscular rigidity and tremor found in Parkinson's disease.

**Serotonin** is an important inhibitory neurotransmitter, which has been found to have a significant effect on emotion,

mood, and anxiety. A significantly low serotonin level is found to be associated with conditions like depression, suicidal thoughts and obsessive compulsive disorder.<sup>(3)</sup>

Vitamin C is a cofactor for dopamine beta- hydroxylase,<sup>(4)</sup> which is involved in the conversion of dopamine to norepinephrine, and a cofactor for tryptophan-5-hydroxylase required for the conversion of tryptophan to 5-hydroxy tryptophan<sup>(9)</sup> in serotonin production. Vitamin also has broad-spectrum antioxidant properties and is essential for the mitochondrial metabolism of fats.<sup>(5)</sup>

A case control study was done in 2004 that looked at 93 institutionalized subjects and 50 subjects who were mentally healthy, all who were aged 65+ years. Despite having similar dietary intakes of vitamin C, the average plasma vitamin C levels were much higher in the control group than those who had some form of dementia (0.84 mg/dl versus 0.56 mg/dl).<sup>(6)</sup>

However, vitamin C supplementation has proven more effective when taken with vitamin E. As vitamin C is oxidized, it appears to regenerate the vitamin E, acting as an antioxidant. This in turn promotes the oxidation of vitamin E and its ability to deactivate other free radicals.<sup>(7)</sup>

In a study of 1081 young men, those who were vitamin C deficient were significantly more anxious and people deficient in vitamin C were also significantly more depressed based on ratings from the Adjective checklist, although not more depressed based on the Frieburg personality inventory scale.<sup>(8)</sup>

A group of patients depressed for 2-5 months had significantly reduced levels of vitamin C as compared to the non-depressed control group<sup>(9)</sup> Another group of 885 patients

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in a psychiatric hospital had significantly lower vitamin C levels than controls, reporting 32% had readings below the range in which negative health effects have been clearly documented.<sup>(10)</sup>

A group of chronic mixed psychiatric patients required a longer time period to achieve vitamin C saturation upon supplementation, suggesting lower vitamin c status.<sup>(11)</sup>

## 2. Aim of the Study

Keeping the above reports in mind, the present study was carried out on random patients from rural background in western U.P. diagnosed as depressed as per the Structured clinical Interview DSM-IV-TR<sup>(12)</sup> to find out the levels of vitamin C in their serum and to compare these with healthy age and sex matched controls.

## 3. Material and Methods

The study was conducted in Shekhul Hind MulanaMahoomdHasan Medical College (Government Medical College) Saharanpur U.P. From amongst patients attending the Psychiatric outpatient department, 30 dissociative patients, were selected randomly. A thorough physical examination and relevant investigation were done to rule out any physical disease. 30 age and sex matched controls from healthy population belonging to the same area were also included in the study. Serum vitamin C levels were measured in all the subjects by dinitrophenyl hydrazine method.<sup>(13)</sup> The mean ( $\pm$ SD) serum vitamin C levels of patients with dissociative were compared with those of controls by Student's t-test.

## 4. Results

Serum Vitamin C levels ranged from 0.3 to 0.6 mg/dl in controls with a mean  $\pm$ SD of **0.39  $\pm$  0.17 mg/dl**. In patients with dissociative disorders, the levels ranged from 0.1 to 0.4 mg/dl with a mean  $\pm$ SD of **0.29  $\pm$  0.16 mg/dl**. The difference between the two groups was highly significant with a p value of <0.01 (Table 1) (figure 3)

**Table 1**

Analyte	Control Group (n=30)	Dissociative Patients (n=30)	P value
Vitamin C (mg/dl)	0.39 $\pm$ 0.17	0.29 $\pm$ 0.16	<0.01

## 5. Discussion

Vitamin C is an anti-oxidant commonly used to boost immunity. It is an established fact that vitamin C is essential for the synthesis of dopamine, serotonin and norepinephrine hence supplement of vitamin C may be considered along with the routine treatment of dissociative disorder. These are the neurotransmitters providing with both physical and motivational energy and feeling of reward and satisfaction.

## 6. Conclusion

This study shows low vitamin C status in dissociative disorders patients as compared to normal individuals, and suggests that vitamin C supplementation can have positive effects in the treatment of these patients. Vitamin C is essential for the synthesis of neurotransmitters required for normal neuronal functioning and the lack of this importance factors can be a cause of treatment failure and resistance in the dissociative disordered population.

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