ORIGINAL ARTICLE

C-REACTIVE PROTEIN LEVELS AMONG MILD AND SEVERE CASES OF DEPRESSION – A PILOT STUDY

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Abstract

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Depression frequently coincides with increased levels of C-Reactive Protein (CRP) in the blood, suggesting that inflammation plays a crucial role in the development of depressive illnesses. The elevation in CRP levels is also associated with cardiovascular disorders. The objective of our study was to assess variations in circulating CRP levels according to the degree of depression.

INTRODUCTION

Depression is a prevalent condition associated with heightened risks of cardiovascular diseases and related mortality [1, 2]. The World Health Organization reports that over 264 million individuals worldwide are affected by depression [3]. Characterized by its tendency for recurrence and chronicity, depression is categorized into mild, moderate, and severe forms according to the ICD-10 classification. Recent research has illuminated depression as a potent and independent risk factor for cardiovascular diseases, even among those without prior physical ailments. The prevalence of depression among cardiovascular patients

is estimated to range between 20-40% [4,5].

Studies have established a link between elevated levels of proinflammatory cytokines and the development of major depressive disorder. Furthermore, it is well-documented that heightened levels of C-Reactive Protein (CRP) serve as a predictor for cardiovascular diseases, with depressed individuals exhibiting a higher cardiovascular risk compared to non-depressed counterparts [6]. The increase in inflammatory cytokines contributes to the reduction of neurotransmitters such as serotonin in the Central Nervous System (CNS), consequently dampening the activation of the hypothalamic-pituitary-adrenal axis and leading to elevated oxidative stress in the brain. This cyclical process exacerbates depressive symptoms [7,8].

This heightened oxidative stress contributes to increased cardiovascular morbidity and mortality, encompassing conditions such as hypertension, stroke, atherosclerosis, myocardial infarction, and congestive heart failure. Research suggests that alterations in the brain-cytokine system can disrupt neurotransmitters and neuronal circuits, thereby influencing an individual's behavior [8].

Despite these findings, the relationship between CRP levels and the severity of depression remains relatively unexplored. Therefore, the objective of our present study is to investigate whether the severity of depression impacts circulating serum CRP levels.

MATERIALS AND METHODS

StudyType: Observational study. This study is a pilot study to examine the future scope of the study.

StudyDesign: Hospital based comparative analysis.

Study Location: Immunoassay lab (Department of Biochemistry) Sawai Man Singh Medical College and Psychiatric Centre of Sawai Man Singh Hospital, Jaipur.

Study Duration: The study wasl completed in 1 month in Nov 2022.

Study Population: Patients suffering from depression reporting to psychiatry O.P.D in Sawai Man Singh Hospital.

InclusionCriteria

- Age between 18-40 years; irrespective of gender will be included.

- Diagnosis and classification of depressive patients according to severity of symptoms will be based on icd-10 classification of mental and behavioral disorders.

- For assessing the severity of depression Hamilton depression rating scale (Ham-D) will be used

on all patients via a structured interview.

- Patient willing to participate in the study.

Exclusion Criteria:

- Patients with history of any other psychiatric illness
- Patient on antipsychotic medication
- Patients with history of metabolic syndrome, cardiovascular disease
- Patients with epilepsy, head injury, alcohol intake and smoking will be excluded.
- Patients with infection, autoimmune disorder
- Patient with thyroid disorders, adrenal disorders
- Pregnant patients
- Patient on thyroid medication
- Patient on antipsychotic medication
- Patients with history of metabolic syndrome, cardiovascular disease

- Patients with respiratory disorders

Sample size: (Roughly 10% of the original intended sample size).

Sampling technique: 8 eligible cases of depression was selected for study on first come basis and categorized equally into mild and severe.

Specific investigations:

1. **C-Reactive protein**

   Samplecollectionandstorage:

   The blood samples of the patients of mild and severe depression was taken in plain vials (C- Reactive protein).

   Grossly hemolyzed and lipemic samples was excluded. The plain vials amples was left standing to clot, after that, serum will be separated immediately by centrifugation and will be analyzed on fully automated analyzer Vitros 5600 and Advia Centaur XP.

RESULTS

Table 1:Age Distribution

	Depression	n	Mean	Std. Deviation	t	p
Age	Mild	4	33.40	10.65	1.54	0.12
	Severe	4	38.03	12.57		

Table 2: Sex Distribution:

		N	Male	Female
Age	Mild	4	1	3
	Severe	4	2	2

Table 3: C-Reactive Protein

Group	CRP (Mean in mg/dl)	SD (mg/dl)	T - value	Unpaired t test	Sig
Mild	1.5	1.3	-2.3	0.04	Sig
Severe	3.3	2.2			

DISCUSSION

C-Reactive Protein (CRP) stands out as one of the extensively studied acute phase reactants. Multiple investigations have highlighted elevated serum CRP levels in individuals grappling with severe depression. For instance, Valkanova V et al. conducted a meta-analysis revealing a notable link between heightened CRP levels and depressive symptoms. However, in our current study, we observed a statistically significant correlation between serum CRP levels and the severity of depression. This observation might be attributed to the multifaceted nature of depression, characterized by chronic stress. This chronic stress often leads to disruptions in the hypothalamic-pituitary-adrenal axis, consequently affecting the body's immune and endocrine systems, which in turn may modulate the inflammatory response.

While some earlier studies have reported a positive association between elevated CRP levels and depression severity, the findings have not been consistently replicated. Notably, to the best of our knowledge, no study to date has specifically investigated CRP levels in relation to the severity of depression. Therefore, there's a potential opportunity to intervene and prevent the progression of mild depression to its more severe forms by monitoring CRP levels early in the course of the illness.

Moving forward, larger sample sizes and extended study durations are warranted to establish a definitive correlation between CRP levels and the severity of depression. Such endeavors could shed further light on the potential for utilizing CRP as a biomarker for depression severity and guide early interventions to mitigate its progression.

CONCLUSION

Hence, assessing CRP levels in individuals diagnosed with depression early on could prove beneficial.

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