ORIGINAL RESEARCH PAPER

Psychiatry

PREVALENCE AND ASSOCIATION OF COGNITIVE IMPAIRMENT IN PATIENTS WITH MODERATE TO SEVERE DEPRESSION: A CROSS SECTIONAL STUDY

KEY WORDS: cognitive impairment, depression, prevalence

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ABSTRACT

Background: Almost all depressive disorder patients have cognitive impairments to a certain extend. Depression and cognitive dysfunction share a common neuropathological platform in cortical and sub-cortical brain areas. The current study was designed to explore the prevalence of cognitive impairment in severe depression and to examine the correlates of cognitive impairment and depression with other sociodemographic variables. **Methods:** A hospital based cross-sectional study on the prevalence of cognitive impairment in moderate to severe depression. Total 100 patients were evaluated using Hamilton rating scale for depression (HAM-D), Addenbrooke's cognitive examination (ACE-III). **Results:** The mean age of study sample was 31.92±7.62 (SD) years. The mean Hamilton Depression Rating Scale score for severe depression was 21.70±1.34 (SD: 1.34). 56(56.0%) patients suffering from depression found to have mild cognitive impairment followed by 28 (28.0%) having major neurocognitive disorder. The mean neurocognitive functions in Mild cognitive impairment was 66.84±2.41, and major neurocognitive disorder was 54.96±4.83. **Conclusion:** Cognitive impairment and depression were well known in elderly population. Present study suggests that more than one fourth of young age patients having severe depression reported cognitive impairment which is more prevalent in the females than in the males. Hence, psychiatrist should pay special attention for early detection and treatment of cognitive impairment.

INTRODUCTION

Cognitive dysfunction is characterised by impairment in the following areas: problem-solving, processing speed, visual and auditory processing, verbal and nonverbal learning, short-term and working memory, attention, and motor functioning. A major mediator of functional impairment in major depressive disorder (MDD) may be cognitive dysfunction [1]. Individuals who appear with MDE usually exhibit self-reported measures of reduced concentration and attention as part of MDD. Furthermore, when treating MDD, it is frequently discovered that cognitive abnormalities continue even during times of symptomatic remission[2], supporting the disconnect between emotional and functional improvement whereas cognitive impairment is a common often persistent, symptom of major depressive disorder that is disproportionately represented in patients who have not returned to full psychosocial functioning[3].

Despite remission from depressive symptoms, cognitive impairments often linger, causing considerable functional burden. Its debilitating effects extend beyond emotional distress, disrupting work performance, social interactions, and overall quality of life. Recent research suggests a strong link between depression and cognitive decline, with depression potentially acting as a prodrome to dementia. Late-life depression, in particular, frequently presents with a constellation of cognitive difficulties, raising concerns about future cognitive deterioration.[4]

It has also been suggested that depression represents a risk factor for the development of future dementia [5]. Because MCI is conceptualized as a predementia state, it is likely that factors associated with dementia (including depression) are also linked to MCI. Despite this, comparatively little is known about the prevalence of depressive symptoms in MCI. The substantial overlap in key symptoms between depression and dementia complicates research in the area. While depression is a disorder of affect and dementia a disorder of cognition, in reality, the two conditions share a number of symptoms in common.

In light of these insights, it becomes clear that cognitive impairment should not be viewed as a mere consequence of depression. Instead, it emerges as a distinct dimension of the disorder, demanding targeted treatment alongside symptom management. Cognitive symptoms should therefore be regarded as a partially independent dimension of MDD, and an important target of any treatment that is initiated. So, we aim to study the cognitive impairment in patients with moderate to severe depression.

Aim of the study

Current study aimed to estimate the prevalence of cognitive impairment in moderate and severe depression and to examine the specific cognitive impairments and its correlation with different degree of depression.

MATERIAL AND METHODS-

Study design-

The present study design is a cross-sectional observational study was conducted in the Out Patient Department (OPD) and In Patient Department (IPD) of the Department of Psychiatry, Career institute of medical sciences and hospital, Ghaila, Lucknow during the study period from June 2022 to May 2023. All the patients who fulfilled the inclusion and exclusion criteria were enrolled in the study, after obtaining their written informed consent in Hindi/English.

Participants-

In this study, a total of 100 diagnosed cases of depression were selected from the patients visiting the inpatient and outpatient facility of the Department of Psychiatry of a tertiary care teaching hospital in North India. Semi-structured interview Proforma was used to collect the identification data, socio-demographic data and clinical data of the selected cases that included a socio-demographic questionnaire. The Hamilton Depression Rating Scale (HDRS) was applied to assess the severity of depression and the Addenbrooke's

Cognitive Examination (ACE III) was administered to assess the level of cognitive impairment.

Inclusion Criteria

1) Patients fulfilling diagnostic criteria of depression according to ICD 10 DCR.
2) Patient willing to give informed consent.
3) Patients between 18 to 60 years of age.

Exclusion Criteria

1) Patients with chronic alcoholism and other substance use disorders
2) Patients with major head injury/intracranial space-occupying lesion
3) Patients with significant visual/hearing loss other than those using aid
4) Patients with h/o intellectual disability
5) Any co-morbid chronic illness
6) Patients with neurodegenerative and neurological illness

Scales used

1) Semi-structured proforma for socio-demographic details of subjects including age, sex, marital status, occupation, education, etc.
2) **Hamilton Depression Rating Scale (HDRS)-** The Hamilton Depression Rating Scale (HDRS), also called the Hamilton Rating Scale for Depression (HRSD), abbreviated HAM-D, is a 21-item questionnaire used to provide an indication of depression.
3) **Addenbrooke's cognitive examination (ACE III)-** The Addenbrooke's Cognitive Examination is 19 item questionnaire. The ACE encompassed tests of five cognitive domains-

- Attention/ Orientation
- Memory,
- Language,
- Verbal Fluency,
- Visuospatial Skills.

It is scored out of 100, with a higher score denoting better cognition.

Statistical Analysis

Microsoft Excel was used in creating the database and producing graphs, while the data was analyzed using the Statistical Package for the Social Sciences (SPSS) version 23 for Windows. Mean and standard deviation (±SD) were used to describe quantitative data meeting normal distribution. Non-normal distribution or continuous variables was compared using Pearson's Chi-square test or fisher's exact test and for means, the student "t" test was used. The level of significance was taken as P <0.05.

RESULTS

In this present study, a total 100 subjects were recruited and the socio-demographic and clinical characteristics of study participants were analyzed.We have observed that nearly half of the patients 48 (48.0%) belonged to ≤30 age group followed by 36 (36.0%) patients belonging to the 31-40 years, and 16 (16.0%) patients belonging to the more than 40 years age group.

The mean age of the studied patients based on Age was 31.92±7.62 years. Most of the patients 61 (61.0%) were female; nearly two third of patients 66 (66.0%) were Hindu; and 37 (37.0%) of patients belonged to Urban followed by 34 (34.0%) and 29 (29.0%) patients who belonged to Rural and Suburban localities respectively. 27 (27.0%) of patients had family history of mental illness.

The 70 (70.0%) patients were found to be suffering from severe depression and 30 (30.0%) patients had moderate depression. The mean HAM-D score in moderate depression was 14.67±0.71 and the mean HAM-D score in severe depression was 21.70±1.34 and the association was found to be statistically significant (p<0.05).

Table 1- Socio-demographic Details Of Participants

Parameters		No. of patients (n=100)	percentage
Age in years	18-30	48	48.0%
	31-40	36	36.0%
	>40	16	16.0%
Mean Age in years		31.92±7.62 Years	
Gender	Female	61	61.0%
	Male	39	39.0%
Marital Status	Married	87	87.0%
	Unmarried	13	13.0%
Residence	Rural	34	34.0%
	Sub-urban	29	29.0%
	Urban	37	37.0%
Education	Illiterate	29	29.0%
	Primary	23	23.0%
	Middle	18	18.0%
	High school	13	13.0%
	Intermediate/Diploma	6	6.0%
	Graduate	11	11.0%
Religion	Hindu	66	66.0%
	Muslim	24	24.0%
	Sikhism	7	7.0%
	Others	3	3.0%

Table 2: Distribution Of Studied Patients Based On Showing Ham-d Rating Scale Symptoms.

HAM-D Rating Scale Symptoms	Range	Frequency (n=100	Mean±SD	p-value
Moderate Depression	14-18	30 (30.0%)	14.67±0.71	<0.001
Severe Depression	>18	70 (70.0%)	21.70±1.34	

Table No. 3: Distribution Of Studied Patients Based On Showing Ace Iii Scale Symptoms

Neuro-cognitive functions (ACE-III) Scale Symptoms	Range	Frequency (n=100)	Mean±SD	p-value
Normal	>71	16 (16.0%)	74.88±2.33	<0.001
Mild Cognitive Impairment	62-71	56 (56.0%)	66.84±2.41	
Major Neurocognitive Disorder	<62	28 (28.0%)	54.96±4.83	

Table No. 4: Distribution Of Patients Between Severity Of Depression And Cognitive Impairment

Severity	ACEIII Group			p-value
	Normal	MCI	Major NCD	
Moderate (n=30)	8 (26.7%)	19 (63.3%)	3 (10.0%)	^{2}=8.418 (df=2); p=0.015
Severe (n=70)	8 (11.4%)	37 (52.9%)	25 (35.7%)	
Total	16 (16.0%)	56 (56.0%)	28 (28.0%)	

Table No. 5: Association Between Severity Of Depression And Cognitive Impairment

Severity	ACEIII			p-value
	Normal	MCI	Major NCD	
Moderate (n=30)	75.75±2.60	66.95±2.54	54.64±4.98	<0.001
Severe (n=70)	74.00±1.77	66.63±2.19	57.67±2.30	<0.001

It was observed that 56 (56.0%) patients suffering from depression found to have mild cognitive impairment followed by 28 (28.0%) having major neurocognitive disorder and 16 (16.0%) patients found to have no cognitive impairment. The mean neurocognitive functions in normal were74.88±2.33, Mild cognitive impairment was 66.84±2.41, and major neurocognitive disorder was 54.96±4.83 and the association

was found to be statistically significant **(p<0.05).**

DISCUSSION-

Major Depressive Disorder (MDD) is one of the most common psychiatric disorders with an estimated lifetime prevalence of 16%.[6] MDD, however, is not solely characterized by its high prevalence but also by its major global impact. Our study findings indicate that a significant number of patients having moderate to severe depression develop cognitive impairment, in which the majority of the moderate depressive patients develop mild cognitive impairment and almost half of the severely depressed patients develop mild cognitive impairment.

Our findings were consistent with the findings of **Ali M et al** [7] who did a study on evaluation of cognitive impairment in patients with major depressive disorder in remission who reported that the mean age of patients was 33.0±8.2 years, 77.7% were female, the average age at onset of MDD was 23.3±6.3 years. The mean HAM-D score in moderate depression was 14.67±0.71 and in severe depression was 21.70±1.34 and the association of mean HAM-D score in moderate and severely depressed patients was found to be statistically significant **(p<0.05).**

In the present study, we noted that 56.0% of patients had mild cognitive impairment followed by 28.0% of patients had major cognitive impairment and the rest 16.0% of patients were normal. **Maramisa MM et al**[8] reported that depression, cognitive impairment preceded depression, but it might be caused by anxiety-like behavior that occurred in early stimulation of chronic unpredictable mild stress The mean ACE-III scores in normal were 74.88±2.33, in the cases of mild cognitive impairment it was 66.84±2.41 and in severe cognitive impairment was 54.96±4.83 and the association of mean ACE-III scores of normal, mild and major cognitive disorder patients was found to be highly significant **(p<0.01).** **Manit S et al** [9] reported that patients with mild-to-moderate depression reported perceived cognitive dysfunction and functional disability. **Douglas KM et al** [10] reported the prevalence of cognitive impairment was highest for the inpatient depression sample and lowest for the outpatient depression sample. **Helmich LH et al** [11] reported the burden of functional impairment in MDD and the importance of recognizing and managing cognitive symptoms in daily practice.

Our study findings clearly indicate that significant number of patients having moderate to severe depression develop cognitive impairment, in which majority of the moderate depressive patients develop mild cognitive impairment and almost half of the severely depressed patients develop mild cognitive impairment. Study revealed that major neuro cognitive disorder is strongly associated with the severity of depression.

The study revealed that major neurocognitive disorder is strongly associated with the severity of depression. Both depressive mood and cognitive impairment are associated with poor psychosocial functioning. As a result, we argue that treating cognitive impairment and alleviating depressive symptoms are both important in improving outcomes for patients with depression. In conclusion, this hospital-based cross-sectional, observational study shows that cognitive impairment is a core feature of depression that cannot be considered an epiphenomenon secondary to symptoms of low mood, and that it may be a valuable target for future interventions.

Limitations of the study

This is a cross-sectional study in which causal relationships between the variables cannot be determined. Future studies might consider alternate designs to examine how the relationship between clinical predictors and cognitive impairment changes throughout the course of depression.

CONCLUSION-

Our study findings indicate that a significant number of patients having moderate to severe depression develop cognitive impairment, in which the majority of the moderate depressive patients develop mild cognitive impairment and almost half of the severely depressed patients develop mild cognitive impairment. The study revealed that major neurocognitive disorder is strongly associated with the severity of depression.

Both depressive mood and cognitive impairment are associated with poor psychosocial functioning. As a result, we argue that treating cognitive impairment and alleviating depressive symptoms are both important in improving outcomes for patients with depression. In conclusion, this hospital-based cross-sectional, observational study shows that cognitive impairment is a core feature of depression that cannot be considered an epiphenomenon secondary to symptoms of low mood, and that it may be a valuable target for future interventions.

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