Assessment of Cognitive Impairment, Sociodemographic Factors and Comorbidities in Depressed Geriatric Patients Attending Tertiary Care Hospital.

Ravi Thakkar[1], Naren Amin[2], Chetan Shah[3], Kamlesh Patel[4]

[1]MD Psychiatry, Assistant Professor, C. U. Shah Medical College and Hospital, Surendranagar, Gujarat
[2]MD Psychiatry, Associate Professor and Head, C. U. Shah Medical College and Hospital, Surendranagar, Gujarat
[3]MD Psychiatry, Associate Professor, C. U. Shah Medical College and Hospital, Surendranagar, Gujarat.
[4]MD Psychiatry, Ex. Professor and Head Psychiatry Department, C. U. Shah Medical College and Hospital, Surendranagar, Gujarat

Abstract

Background: World Health Organization estimated that the overall prevalence rate of depressive disorders among the elderly varies between 10% and 20%. High levels of depression were significantly associated with cognitive decline in a prospective study. Individuals with Alzheimer's disease have been found to commonly have depression early in the course of their illness.

Method: Study was conducted in the Department of Psychiatry at tertiary care hospital. Written informed consent was obtained from cases who fulfilled the criteria. Socio-demographic data and clinical variables were recorded. Depression was assessed with the geriatric depression scale (GDS) and cognitive impairment was assessed with a standardised mini mental state examination scale (MMSE).

Result: 100 Geriatric Depressed Patients were included in this study. 57% of geriatric patients had mild depression and 43% of geriatric patients had severe depression. Association between severity of depression and various socio-demographic factors were not found significant. 41% of patients had substance abuse. 59% of patients had one or more physical comorbidity. 47 patients had cognitive impairment. In patients with cognitive impairment, 29 patients (61.7%) had mild cognitive impairment, 14 patients (29.8%) had moderate cognitive impairment and 4 patients (8.5%) had severe cognitive impairment.

Conclusion: Geriatric depression is affected by various socio-demographic variables. More severe depression is found in those who are illiterate, single or widow, nonearning, from lower socioeconomic class, using any substance and having physical comorbidities. Geriatric depression also affects cognitive impairment and vice versa. More cognitive impairment is seen in severely depressed patients. Association between different age groups and cognitive impairment is found statistically significant.

Keywords: Geriatric, depression, cognitive impairment, dementia.

Introduction

People aged 60 years and above are define as older people.[1] India is the second most populated country in the world in terms of the elderly population of 60 years and above. According to Population Census 2011, there are nearly 104 million elderly persons (aged 60 years or above) in India; 53 million females and 51 million males. [2]

Geriatric Depression:

Depression is a mental status characterized by the feeling of sadness, loneliness, despair, low self-esteem, and self-reproach, accompanying signs include psychomotor retardation or at times agitation, withdrawal from Interpersonal contact, and vegetative symptoms such as insomnia and anorexia. [3]

The World Health Organization stated that "Depression is the leading cause of disability and the fourth leading contributor to the global burden of disease. [4] The World Health Organization(WHO) estimated that the overall prevalence rate of depressive disorders among the elderly generally varies between 10% and 20% depending on cultural situations. [5] Ageing is an evitable developmental phenomenon bringing along a number of changes in the physical, psychological, hormonal and social conditions of individuals. Old age has been viewed as problematic period of one's life and this view is correct in the sense that the aged become increasingly dependent on other people. [6,7] It may have several consequences in the life of the elderly population including reduced life satisfaction and quality of life, social deprivation, loneliness, cognitive decline, impairment in activities of daily living, suicide and an increase in non-suicide mortality. [8]

Cognitive decline associated with depression:

Cognitive decline has also been repeatedly shown to be associated with depression, although causality in this relationship remains poorly understood. [9] High levels of persistent depression were significantly associated with cognitive decline in a prospective study, where an MMSE score decrease of three or more points was considered a significant decline. [10,11] According to Blazer & Hybels (2005), the overreaction to and/or the misinterpretation of events, which is characteristic of cognitive distortions often leads to depressive disorders in older adult. Individuals with Alzheimer's disease have been found to commonly have depression early in the course of their illness to the extent that late-onset depression in the absence of acute psychosocial distress has been described as prodromal to Alzheimer's disease. [12] Depression has been associated with lower levels of Amyloid-beta42 (Aß42) in blood plasma. [13] A lower level of Aß circulating in the blood plasma and cerebrospinal fluid has been associated with the accumulation of Aß plaques in the brain and is therefore considered a biomarker of Alzheimer's disease. [14] A noradrenergic and cholinergic deficit due to neuronal degeneration in the locus coeruleus and basal nucleus of Meynert may also represent an organic contribution to depression in Alzheimer's disease. [15]

Societal modernisation has brought in its wake a breakdown in family values and the framework of family support. With ongoing economic development, children are moving to urban areas, sometimes leaving their parents alone at home. If the parents move with their children, they are sometimes unable to adjust to the new environment. The change in the family structure along with economic insecurity results in the elderly losing their relevance and significance in their own house and increasing feelings of loneliness. This has a detrimental influence on the psychological health of the elderly. [16]

Symptomatology of Geriatric Depression:

Fifth Edition of Diagnostic and Statistical Manual of Mental Health Disorders (DSM 5) criteria for major depression includes at least two week periods of depressed mood or diminished interest or pleasure in all activities and at least four other symptoms from the following: Significant weight loss when not dieting or significant weight gain, Insomnia or hypersomnia nearly every day, Psychomotor agitation or retardation nearly every day, Fatigue or loss of energy nearly every day, Feeling of worthlessness or excessive or inappropriate guilt, Diminished ability to think or concentrate or indecisiveness nearly every day, Recurrent suicidal thoughts, ideas, plan and attempts. [17]

Cognitive impairment in depressed geriatric patients is referred to as the dementia syndrome of depression (pseudo dementia), which can be confused easily with true dementia. In true dementia, intellectual performance usually is global, and impairment is consistently poor; in pseudo dementia, deficits in attention and concentration are variable. Compared with patients who have true dementia, patients with pseudo dementia are less likely to have language impairment and to confabulate; when uncertain, they are more likely to say I don't know; and their memory difficulties are more limited to free recall than to recognition on cued recall tests. Pseudo dementia occurs in about 15% of depressed older patients, and 25 to 50% of patients with dementia are depressed. [18]

Aims of the Study:

In depressed geriatric patients

1. To assess the severity of depression.
2. To assess the presence of cognitive impairment and physical comorbidities.
3. To study the correlation of cognitive impairment, physical comorbidities, and various socio-demographic factors.

Material and Method

The study was conducted in the Department of Psychiatry of tertiary care hospital. The geriatric patients attending the outpatient and inpatient facilities of the Department of Psychiatry with diagnosed depression and who fulfilled inclusion criteria were included in the present study. They were explained about the study and written informed consent was taken.

Declaration of patient consent

Patient consent statement was taken from each patient as per institutional ethics committee approval along with consent taken for participation in the study and publication of the scientific result / clinical information without revealing their identity, name or initials. The patient aware that though confidentiality would be maintained anonymity cannot be guaranteed.

Inclusion Criteria:

1. Patient attending Psychiatric OPD with age > 60 years.
2. Geriatric Depression Scale score ≥10

Exclusion Criteria:

1. Geriatric depression scale score < 10.
2. Patient with active psychotic/manic symptoms.
3. Patients with the acute confusional state due to general medical condition, substance intoxication and withdrawal.

Sample Size: 100 patients

Procedure:

Written informed consent was obtained from all cases who fulfilled the inclusion and exclusion criteria. The socio-demographic data and clinical variables were recorded in a specific Performa prepared for this clinical study. A detailed history about a depressive episode, duration, risk factors, substance use, physical comorbidities, memory, and history of any psychiatric illness was evaluated. All the patients underwent a thorough clinical and psychiatric

examination. Depression and cognitive impairment were assessed using the following instruments/scales:

- GDS
- MMSE

Socio-demographic details:

All patients provided information about their age, sex, religion, residence, education, occupation, marital status, family type, and socio-economic status.

Clinical data:

Depression-related factors and duration of the depressive episode. The other details regarding hypertension, diabetes, and other comorbidities, as well as substance use, was evaluated.

Instruments / scales:

GDS (Geriatric Depression Scale):

The study of Yesavage and colleagues gave a tool known as the Geriatric Depression Scale (GDS) in 1983 to find the severity of depression among the elderly population. The GDS is a brief, self-rating questionnaire in yes or no format. It was designed specifically for use with the older adult population so the yes or no format was chosen to reduce confusion and facilitate uncomplicated administration. The researchers' reliability and validity testing indicated that the GDS had a high test-retest reliability of 0.85. It was found to have 92% sensitivity and 89% specificity when evaluated against diagnostic criteria. The patients were classified into the categories of "normal", "mildly depressed" or "severely depressed".[19,20]

The scale consists of 30 yes/no questions. Each question is scored as either 0 or 1 point. The following cut-off is used to classify the severity of depression.

0-9 = Normal

10-19 = Mild Depression

20-30 = Severe Depression

MMSE (Standardized Mini-Mental State Examination):

It was originally introduced by Folstein *et al.* in 1975, to differentiate organic from functional psychiatric patients.[21,22] The standard MMSE form which is currently published by Psychological Assessment Resources is based on its original 1975 conceptualization, with minor subsequent modifications by the authors. It is 12 item inventory with a possible score of 30 that is used extensively in clinical and research settings to measure cognitive impairment[23]. Administration of the test takes between 5 and 10 minutes and examines functions including, basic language skills, orientation to time and place, registration and recall of objects, calculations and constructional ability. [24] It is also used to estimate the severity and progression of cognitive impairment and to follow the course of cognitive changes in an individual over time; thus making it an effective way to document an individual's response to treatment[22]. The MMSE also has good test-retest reliabilities, a sensitivity of 0.85 and specificity of 0.90 for a cutoff score of 24.[25]

Scoring:

- ≥ 24 = Normal cognition.
- 19-23   =   Mild   cognitive impairment
- 10-18   =   Moderate   cognitive impairment
- ≤ 9 = Severe cognitive impairment[26]

Data Analysis:

The collected data were subjected to statistical analysis by using SPSS16. A Chi-square test was used to find out the statistical significance of variables in influencing compliance. The P value of less than or equal to 0.05 was used as a cut-off for measuring significance.
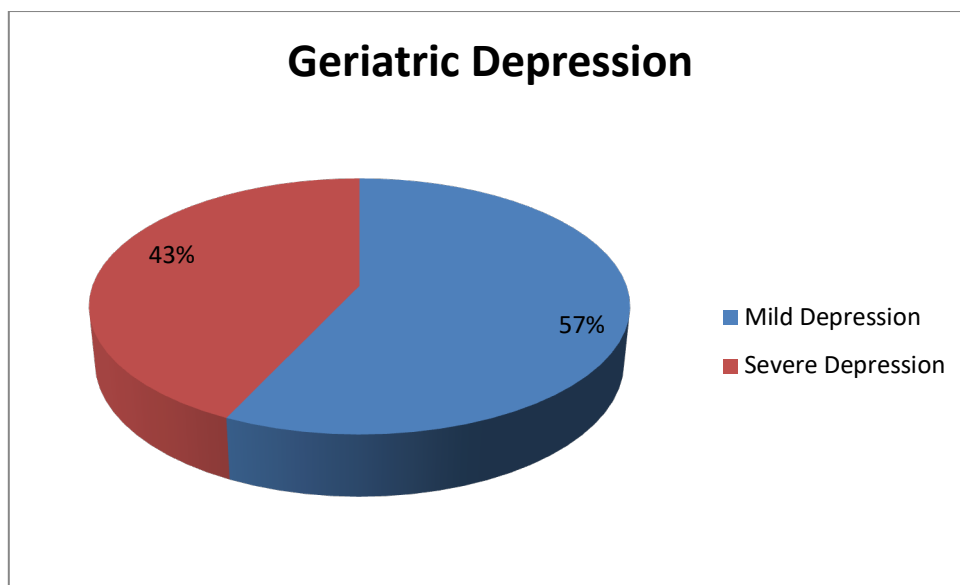
Observation and Result

Figure1: Geriatric depression and severity

100 Geriatric Depressed Patients were included in this study. Out of 100 patients, 57 had mild depression and 43 had severe depression.

Table 1: Correlation between Socio-demographical variables and Geriatric Depression

Socio-demographical variables		Mild Depression	Severe Depression	Total	Chi Square	DF	P Value
Age	61-65	18	16	34	1.248	4	0.872
	66-70	19	12	31			
	71-75	9	9	18			
	76-80	7	4	11			
	>80	4	2	6			
Sex	Male	27	20	47	0.007	1	0.933
	Female	30	23	53			
Religion	Hindu	51	38	89	0.03	1	0.862
	Muslim	6	5	11			
Residence	Rural	35	25	60	0.109	1	0.741
	Urban	22	18	40			
Education	Literate	30	22	52	0.021	1	0.885
	Illiterate	27	21	48			
Occupation	Regular Earning	15	12	27	2.54	2	0.281
	Inconsistent Earning	6	1	7			
	Non-Earning	36	30	66			
Marital Status	Single	1	6	7	12.552	3	0.0057
	Married	34	13	47			
	Divorced	2	5	7			
	Widow	20	19	39			
Family Type	Joint	32	14	46	5.487	1	0.0192
	Nuclear	25	29	54			

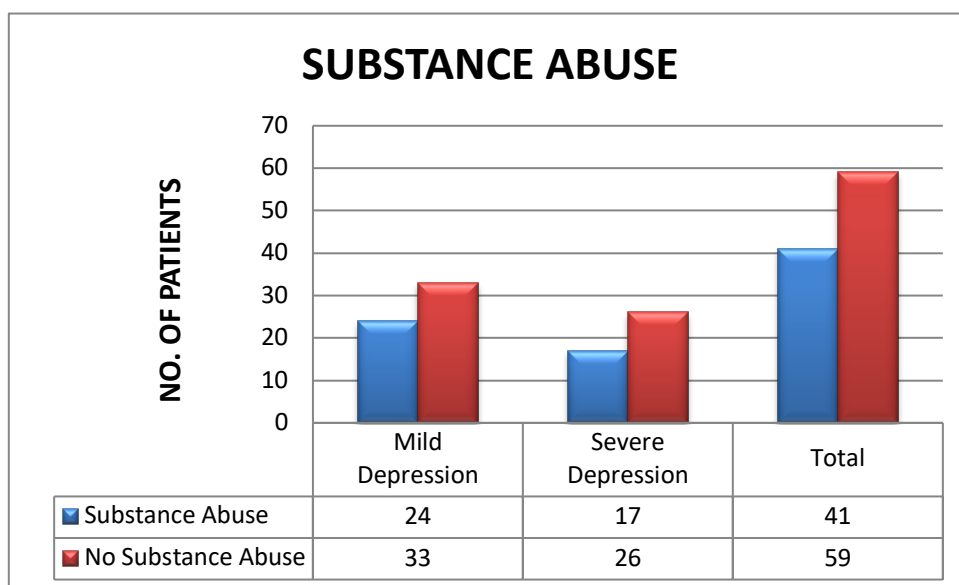| Socio-economic class	Upper	4	3	7			
	Upper Middle	9	7	16			
	Lower Middle	22	7	29	6.995	4	0.136
	Upper Lower	12	12	24			
	Lower	10	14	24			

Figure 2: Correlation between substance abuse and severity of Geriatric Depression

In 100 geriatric depressed patients, 41 patients were abusing substances (the most common was nicotine) and from which 24 patients had mild depression and 17 patients had severe depression. 59 patients were not abusing any substance from which 33 patients had mild depression and 26 patients had severe depression. The Association between substance abuse and the severity of geriatric depression was not found significant. (Chi-square: 0.067, DF: 1, p= 0.796)
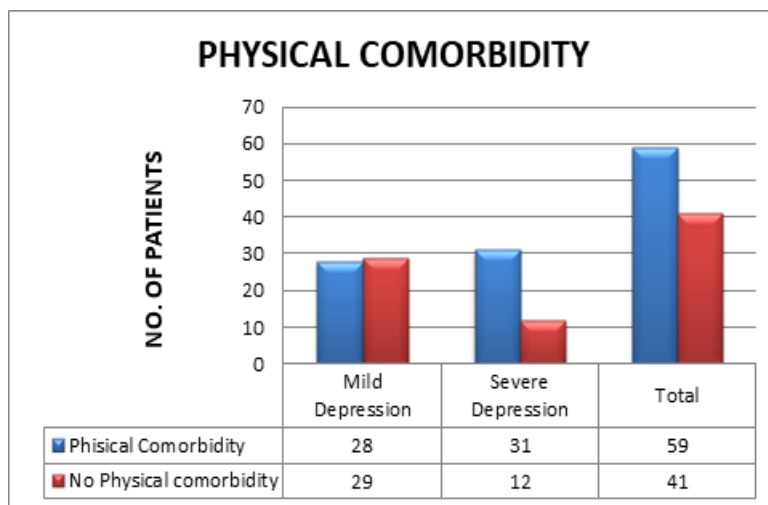

Figure 3: Correlation between physical comorbidity and severity of Geriatric Depression

In 100 geriatric depressed patients, 59 patients had one or more physical comorbidity. 37 patients had one co-morbidity (most common hypertension and second most common was diabetes) and 22 patients had 2 or more co-morbidities. Out of these 59 patients, 28 patients had mild depression and 31 patients had severe depression. 41 patients had no other co-morbidity from which 29 patients had mild depression and 12 patients had severe depression. The Association between co-morbidities and severity of geriatric depression was not found significant.(Chi-square: 5.346, DF: 1, p-value: 0.021)
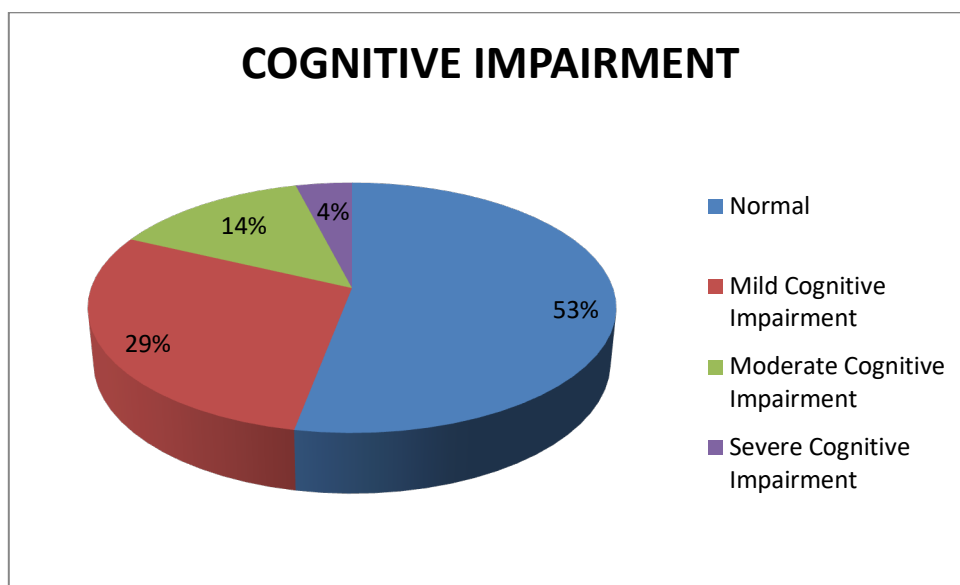

Figure 2: Cognitive impairment in geriatric depression

Out of 100 geriatric depressed patients, 53 patients had MMSE score >23 (no cognitive impairment), 29 patients had MMSE score between 19-23(mild cognitive impairment), 14 patients had MMSE score between 10-18 (moderate cognitive impairment), 4 patients had MMSE score <10. (severe cognitive impairment).
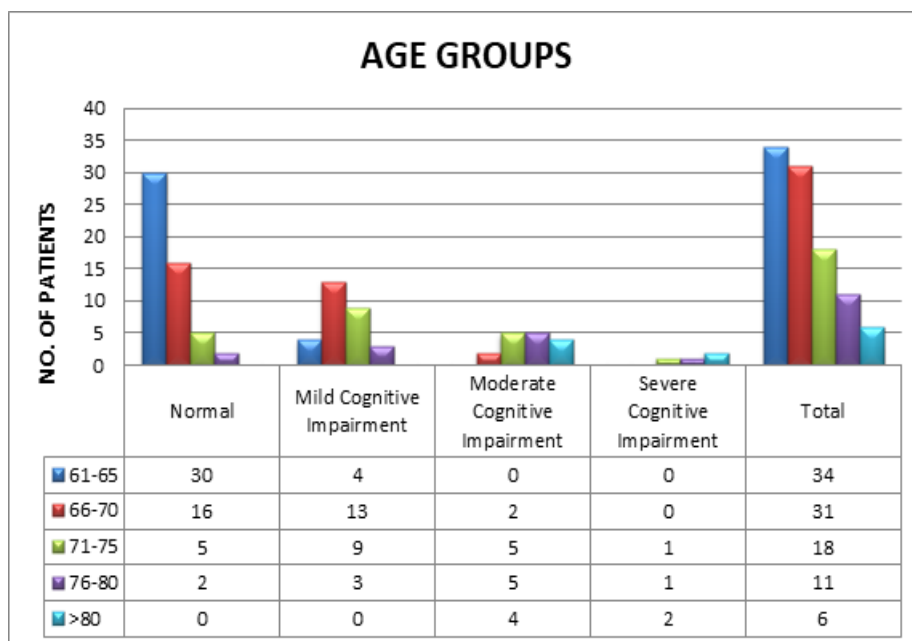

AGE GROUPS	Normal	Mild Cognitive Impairment	Moderate Cognitive Impairment	Severe Cognitive Impairment	Total
61-65	30	4	0	0	34
66-70	16	13	2	0	31
71-75	5	9	5	1	18
76-80	2	3	5	1	11
>80	0	0	4	2	6

Figure 4a: Correlation between different age groups and cognitive impairment

In 100 geriatric depressed patients, 34 patients were between 61-65 years from which 30 patients had no cognitive impairment and 4 patients had mild cognitive impairment. 31 patients were between 66-70 years from which 16 patients had no cognitive impairment, 13 patients had mild cognitive impairment and 2 patients had moderate cognitive impairment. 18 patients were between 71-75 years from which 5 patients had no cognitive impairment, 9 patients had mild cognitive impairment, 3 patients had moderate cognitive impairment and 1

patient had severe cognitive impairment. 11 patients were between 76-80 years from which 2 patients had no cognitive impairment, 3 patients had mild cognitive impairment, 5 patients had moderate cognitive impairment and 1 patient had severe cognitive impairment. 6 patients were more than 80 years from which 4 patients had moderate cognitive impairment and 2 patients had severe cognitive impairment. Association between different age groups and cognitive impairment was not found significant. (Chi-square: 67.695, DF: 12, p-value: 0)
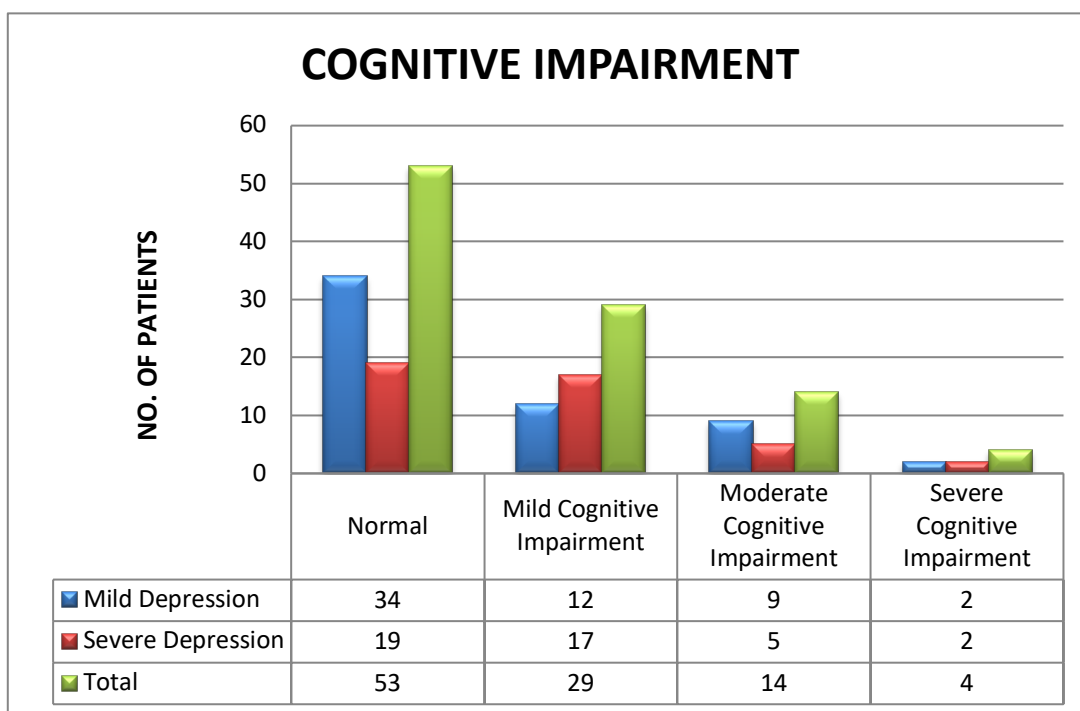

Figure 4b: Correlation between cognitive impairment and severity of Geriatric Depression

In 100 geriatric depressed patients, 53 patients had no cognitive impairment from which 34 patients had mild depression and 19 patients had severe depression. 29 patients had mild cognitive impairment from which 12 patients had mild depression and 17 patients had severe depression. 14 patients had moderate cognitive impairment from which 9 patients had mild depression and 5 patients had severe depression. 4 patients had severe cognitive impairment from which 2 patients had mild depression and 2 patients

had severe depression. The Association between cognitive impairment and severity of geriatric depression was not found significant. (Chi-square: 4.376, DF: 3, p-value: 0.224)

Discussion

In this study, 57% of geriatric patients had mild depression and 43% of geriatric patients had severe depression. This is close to other study by G.Radhakrishnan (2006) which concluded that 37% of geriatric depressed patients had severe

depression and 63% had mild depression. [27]

Geriatric depression and socio-demographic data

In the present study, the association between severity of geriatric depression and various sociodemographic factors, like age, sex, religion, education, residence, marital status, family type, occupation and SEC were not found significant. This result is similar with studies of Pracheth R, Mayur SS, Chowti JV. [28]

Geriatric depression, substance use and physical comorbidities

In the present study, 41% of geriatric depressed patients had substance abuse, most patients were males. The Association between the severity of geriatric depression and substance abuse was not found significant. Studies by Pracheth R, Mayur SS, Chowti JV found that 54% of patients were having substance abuse and the association was not found significant.[28]

In the present study, 59 patients (59%) had one or more physical comorbidity. The severity of depression (31 patients had severe depression) was also found more in patients having physical comorbidities. The Association between the severity of geriatric depression and physical comorbidities was not found significant. This is similar to studies of Pracheth R, Mayur SS, Chowti JV, Hughes et al, Foley DJ et al and Sreejith S. Nair et al also found similar results. [29,30]

Geriatric depression and cognitive impairment

In the present study, out of 100 geriatric depressed patients, 53 patients (53%) had normal MMSE score. 47 patients (47%) had cognitive impairment. In patients with cognitive impairment, 29 patients (61.7%) had mild cognitive impairment, 14 patients (29.8%) had moderate cognitive impairment and 4 patients (8.5%) had severe cognitive impairment. After 70

years of age, 80% had some kind of cognitive impairment. Cognitive impairment was more observed in severe depression. 56% of severely depressed patients had cognitive impairment while only 40% of mild depressed patients had cognitive impairment. Association between cognitive impairment and geriatric depression was found significant.

Krishna Prasad Muliyala and Mathew Varghese found that 50% of geriatric depressed patients had cognitive impairment and 63% of patients had mild cognitive impairment which is similar to our study.[31] Wilson and his colleagues also found that 52% had mild cognitive impairment which is similar to our study. [32,33]

Limitations:

- The population of this study was not representative of the general population.

- In a few patients' cognitive impairments were severe and so they could not give proper answers for the quality-of-life questionnaire so their quality of life could not be assessed accurately.

- Follow-up evaluation was not included in the study.

Conclusion

1. The result of this study shows geriatric depression is affected by various socio-demographic variables. More severe depression is found in those who are illiterate, single or widow, nonearning, from lower socioeconomic class and using any substance.

2. This study shows the majority of geriatric depressed patients have one or more physical comorbidities and severe depression present more in patients with comorbidities than without any comorbidity.

3. Geriatric depression also affects cognitive impairment and vice versa.

More cognitive impairment is seen in severely depressed patients. Association between different age groups and cognitive impairment is found statistically significant.

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