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A Prospective Study of Prescription Pattern and Assessing the Psychiatric Comorbidities in Dementia Patients in a Tertiary Care Hospital in South Kerala

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ABSTRACT

Background :Dementia is one of the most common disorders among elderly patients, Worldwide 7.7 million new cases of dementia were anticipated each year, implying one new case every 4.1 seconds**.Aim and Objective :** The aim of the study is to assess the psychiatric co morbidity and prescribing pattern in dementia patients in a tertiary care hospital in south India.**Methods:** This was a Prospective Observational Study study conducted at tertiary care hospital. Prospective data was collected from outpatient and inpatient department. **Results :** Out of 48 patients the common type of dementia reported was Alzheimer's disease found in ,56.3% of the cases followed by vascular dementia and the prescribed drugs were Donepezil (37.5%) is the prescribed drug for most of the dementia cases followed by Memantine (25%),Memantine+Donepezil combination (18.75%), Rivastigmine (12.5%), Memantine+Rivastigmine combination (6.2%). **Conclusion :** The common type of dementia reported was alzheimers and Donepezil was the most commonly prescribed drug in mono-therapy and among combination therapy Memantine–donepezil combination was mostly prescribed.

Keywords: dementia, prescribing pattern , psychiatric co morbidity

I. INTRODUCTION

All cause dementia is defined as the decline in cognitive function, which is severe enough to impair a person`s ability to conduct instrumental activities of daily living. Dementia is one of the most disabling disorders affecting adult and elderly populations. It is estimated that 4.6 million new cases of dementia are diagnosed worldwide each year and with increasing life expectancy, the prevalence of dementia will increase dramatically in the next few decades, and will have a phenomenal emotional and economic impact. Thus, dementia and cognitive impairment are one of the major public health concerns in the 21st century.

In India 1.8 million people are affected with dementia and it is also emerging as an important health problem in Kerala, the southernmost state of India.. Dementia is characterised by progressive loss of memory leading to impairment of daily activities and deficiency in social interaction [3].

Dementia is usually caused by nervous system disease, The few studies that have studied dementia in Kerala report prevalence rates of around 3.4%, with Alzheimer's disease as the most common subtype.The first defined histopathologic features of AD were extracellular amyloidal plaques and intracellular neurofibrillary tangles. Vascular dementia is associated with focal damage in random network of cortical and subcortical regions or white matter tract that disconnect nodes within disturbed networks.patients with dementia that begins in frontal or subcortical regions such as fronto-temporal dementia or Huntigton's disease are less likely to begin with memory problems and more likely to have difficulties with mood and behaviour[1].

The treatment of dementia is basically directed towards management of cognitive and behavioural symptoms of dementia. Particularly effective treatments are available for most common symptoms of dementia. Acetylcholinesterase

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inhibitors such as Donepezil, Rivastigmine ,andGalantamine have been recommended to be used in mild to moderate cases of dementia while NMDA receptor antagonist Memantine is the only drug recommended for severe cases of dementia.

Patients with cognitive impairment may experience a range of behavioralproblems . Comorbidity of psychiatric disorder along with cognitive impairment have been associated with increased mortality,reduced quality of life and increases in caregiver burden and distress.Of the psychiatric disorders associated with dementia , anxiety and depression are the most Common. By keeping the patient active, focusing on their positive abilities, and avoiding stress can minimize the extent of cognitive deterioration in dementia cases By keeping the patient active and focusing more on their positive abilities, as well as avoiding stress can minimize the extent of cognitive deterioration in dementia cases..

The Prescription pattern monitoring studies are based on assessing the prescription, dispensing and distribution of medicines. The main objective of prescription pattern monitoring studies is to facilitate the rational use of drugs in populations. It helps in understanding of how drugs are being used and it is considering as a valuable investigation resource in pharmaco-epidemiology pharmacovigilance&pharmaco-economics.

With increasing life expectancy, the prevalence of dementia will increase dramatically in the next few decades, and will have a phenomenal emotional and economic impact. Thus cognitive impairment and dementia are one among the major public health concerns of the 21st century.The pharmacist's participating in Prescription pattern monitoring studies can directly improve the quality of care for patients, individually and as populations to prevent the use of un-necessary or inappropriate drug therapy, prevent adverse drug reactions and improve over all drug effectiveness In this context there seems to be scarcity of data regarding dementia. This study highlights the present scenario of dementia in relation to epidemiology, psychiatric co morbidity and drug utilization pattern in a tertiary care hospital in south kerala [2-4].

II. METHODOLOGY

A prospective observational study was conducted in patients from department of Neurology in cosmopolitan hospital who were diagnosed with Dementia during the study period after obtaining permission for collection of data from Institutional Human Ethical Committee.

The study was carried out from December 2019 to May 2020 in patients diagnosed with dementia of age group >50 years. The study subjects were selected based on the inclusion and exclusion criteria. Both male and female patients ,patient whose were diagnosed with Dementia by neurologist according to DSM-4 criteria,Patients who agree to participate in this study were included and patients with terminal illness,patients who were bed-ridden and with past history of head injury, seizures and psychiatric disease those who were not willing to participate were excluded from the study.

The total sample size of the study was 48. Patients data collection form was prepared on the basis of study objectives. The study was implemented by direct interview with the patient or informant.

A written informed consent was obtained as per ICMR biomedical research guidelines from the patients diagnosed with Dementia satisfying the inclusion and exclusion criteria. All information relevant to study was collected from case records and direct interview with patients. Data from patients were collected by using a suitably designed proforma. Additional demographics data of patients such as family history, occupational history, known allergies were obtained.The patients were educated about the disease and medication. Pharmacotherapy data (indication, dose, posology, scheduling, and reports on the access to medicines) were collected from the medical prescription, patient diary and all medicines (over-the-counter and prescription medicines) brought by the patient to the appointment with the physician.

The patients or care taker were educated about the disease and medication. To assess the patient condition DSRS (Dementia severity Rating scale)questionnaire and SLUMS Scale were used on all the patients during each visit. To assess psychiatric co morbidities in dementia patients HADS(Hospital anxiety and depression scale)was used.To improve the quality of life in patient by giving effective counselling to the caregiver.The obtained clinical data's statistically analyzed through SPSS Software version 21.00 and paired t-test.

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III. RESULT

TABLE 1: DEMENTIA PATIENTS AGE DISTRIBUTION

Age in years	Frequency	Percentage
≤70	6	12.5
71 - 75	3	6.3
76 - 80	15	31.3
81 - 85	15	31.3
>86	9	18.8
Total	48	100.0

Average age of the study population was 79.9 ± 6.1 and age ranges from 69-89 years. 12.5% of the patients were in the age group ≤70 years, 6.3% were 71-75 years,31.3% were in the 76 -80 years and 81-85 years and 18.8 % >86 years. Dementia is mostly observed in the age groups from 76 – 85 years and least observed in the age group from 71- 75.

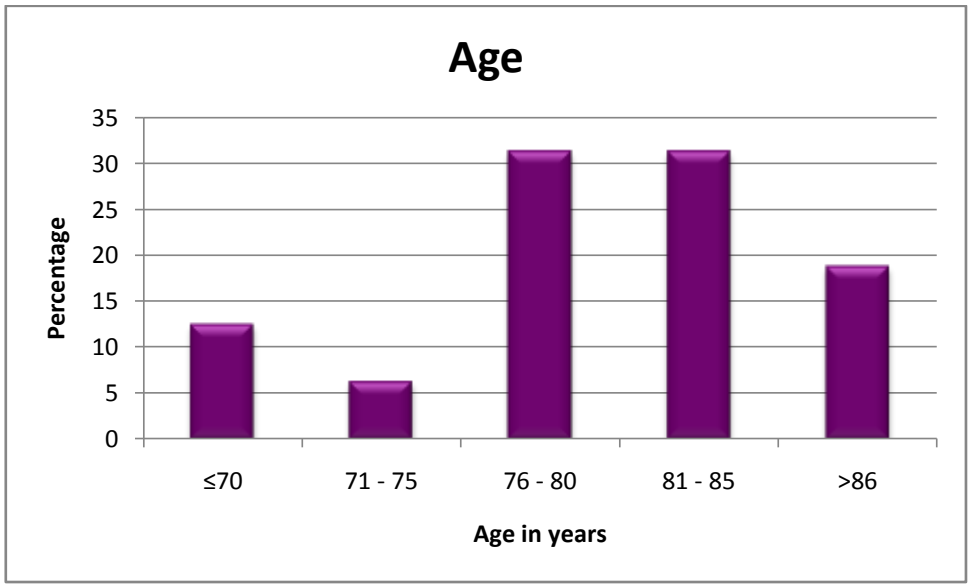

FIGURE 1: AGE DISTRIBUTION OF DEMENTIA PATIENTS.

TABLE 2 : PREVALENCE OF DEMENTIA ACCORDING TO GENDER

Sex	Frequency	Percentage
Male	27	56.3
Female	21	43.8
Total	48	100.0

In the gender distribution males dominated in the study population which is 56.3% while in females it is 43.8% as depicted in TABLE .2

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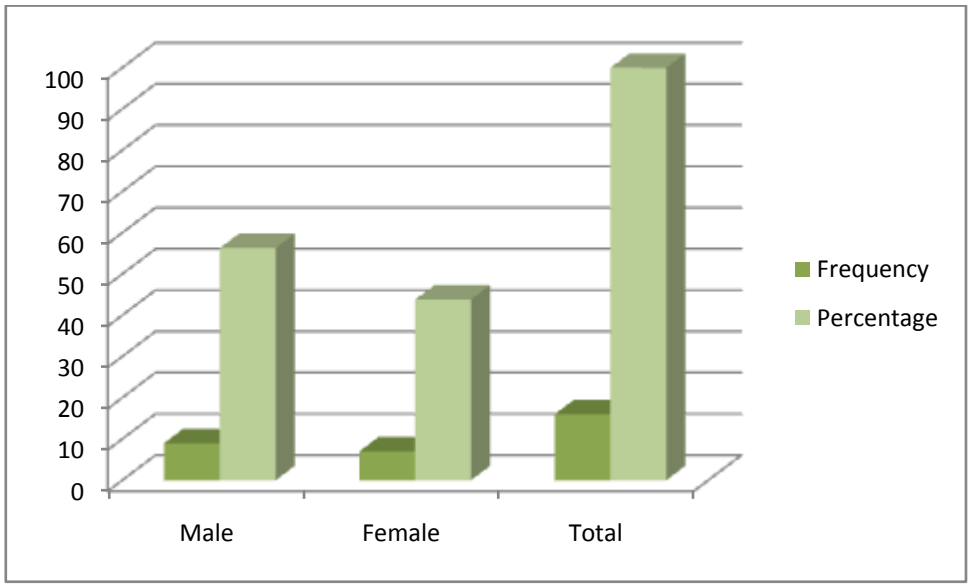

FIGURE 2 : PREVALENCE OF DEMENTIA ACCORDING TO GENDER.

TABLE 3: DISTRIBUTION OF PATIENTS BASED ON FAMILY HISTORY

SL.No	Family history	Frequency (n=48)	Percentage (%)
1	Present	6	12
2	Absent	42	88

11iiiiytftyfytf
In the study population 12 % of patients have significant family history of Dementia

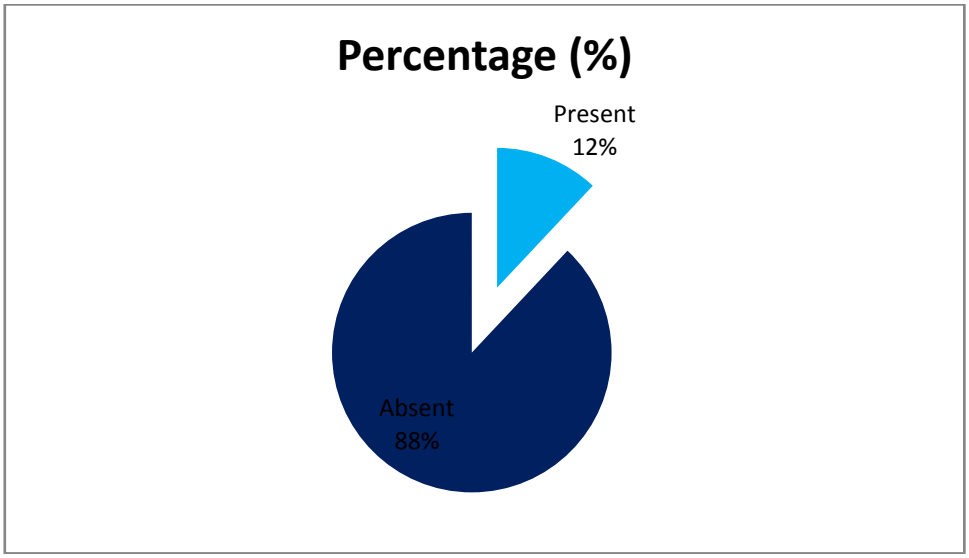

FIGURE 3: DISTRIBUTION OF PATIENTS BASED ON FAMILY HISTORY

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TABLE 4 :EDUCATION STATUS OF DEMENTIA PATIENTS.

Qualification	Frequency	Percentage
Illiterate	6	12.5
High school	3	6.3
Higher secondary	6	12.5
Graduate	27	56.3
Postgraduate and above	6	12.5
Total	48	100.0

Regarding education of patients in the sample, it was noted that 56.2% of the patients were college graduates,12.5% of the patients were high school graduates,12.5% were higher secondary graduates and 12.5% were post graduates and 12.5% of the patients were illiterate.

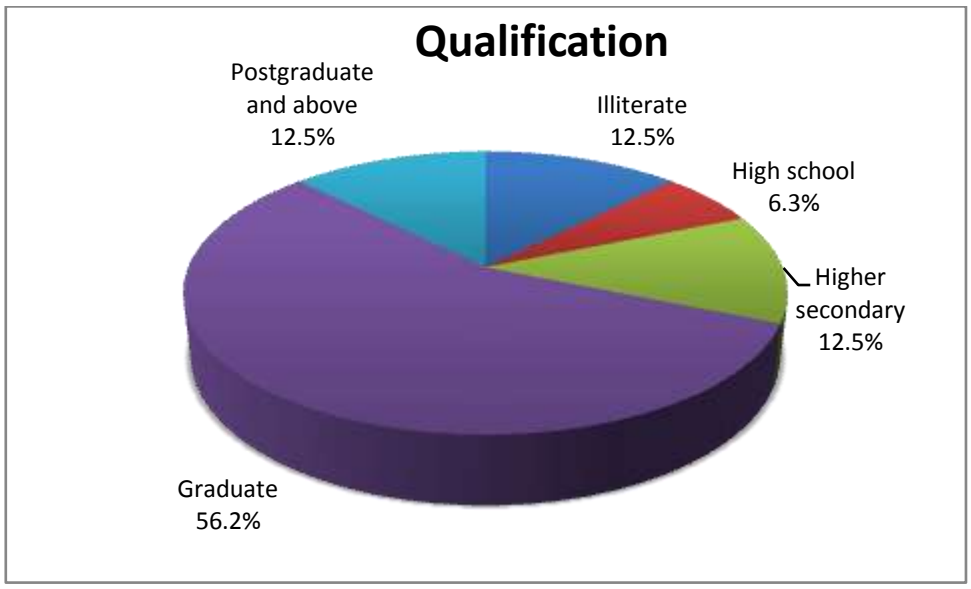

FIGURE 4 : EDUCATION STATUS OF DEMENTIA PATIENTS.

TABLE 5 :OCCUPATION OF DEMENTIA PATIENTS

Occupation	Frequency	Percentage
Employed	21	43.8
Business	12	25.0
Manual labour	3	6.3
Unemployed	12	25.0
Total	48	100.0

Regarding the occupational status of dementia patients,43.8% of the patients were employed,25% of the patients were businessmen,25% of them were unemployed and 6.3% of the patients were manual labour.

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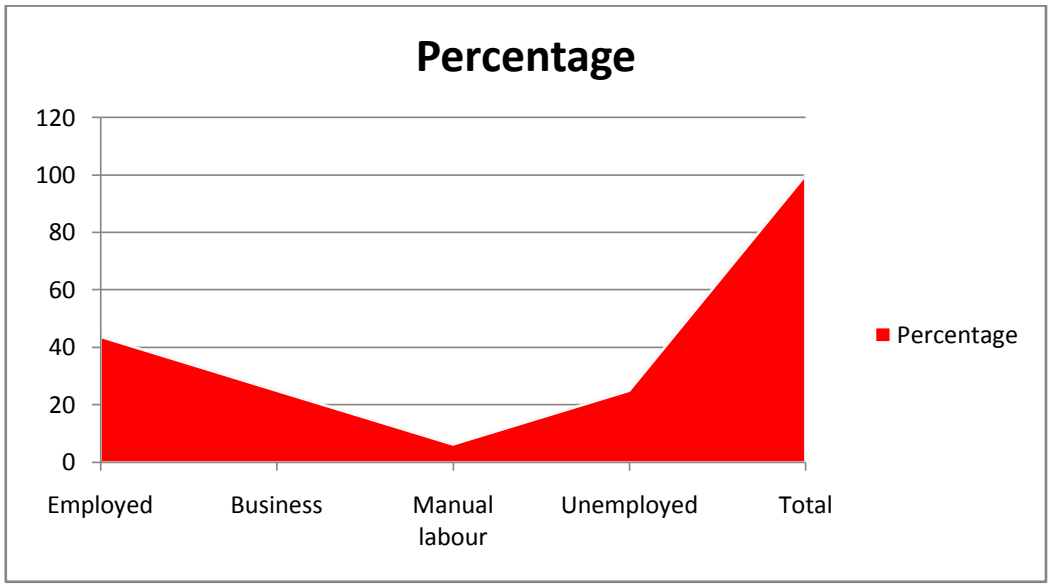

FIGURE 5 : OCCUPATIONAL STATUS OF DEMENTIA PATIENTS

TABLE 6 : MARITAL STATUS OF DEMENTIA PATIENTS

Maritalstatus	Frequency	Percentage
Married	39	81.3
Unmarried	3	6.3
Seperated	3	6.3
Widow/Widower	3	6.3
Total	48	100.0

Regarding the marital status of the patients,81.3% of the patients were married and 6.3% of the patients were unmarried,6.3% of them were separated and 6.3% of the patients were widowed.

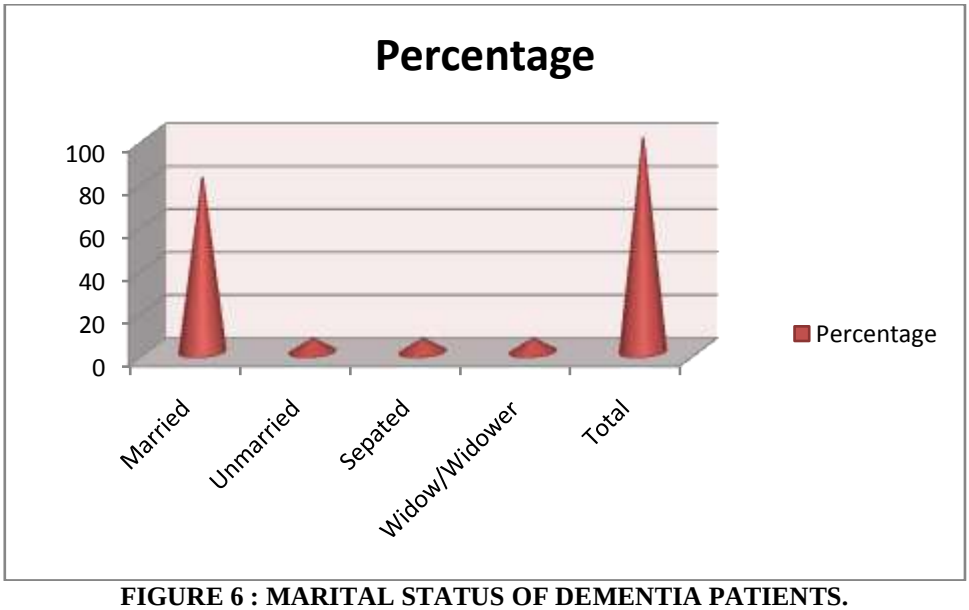

FIGURE 6 : MARITAL STATUS OF DEMENTIA PATIENTS.

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TABLE 7 : SOCIO-ECONOMIC STATUS OF DEMENTIA PATIENTS.

SES	Frequency	Percentage
Upper	6	12.5
Upper middle	9	18.8
Lower middle	12	25.0
Upper lower	21	43.8
Total	48	100.0

Regarding the socio-economic status of dementia patients, 43.8% of the patients were of upper lower class,43.8% were of upper middle class,25% of the patients were of lower middle class and18.8% of the patients were of upper class.

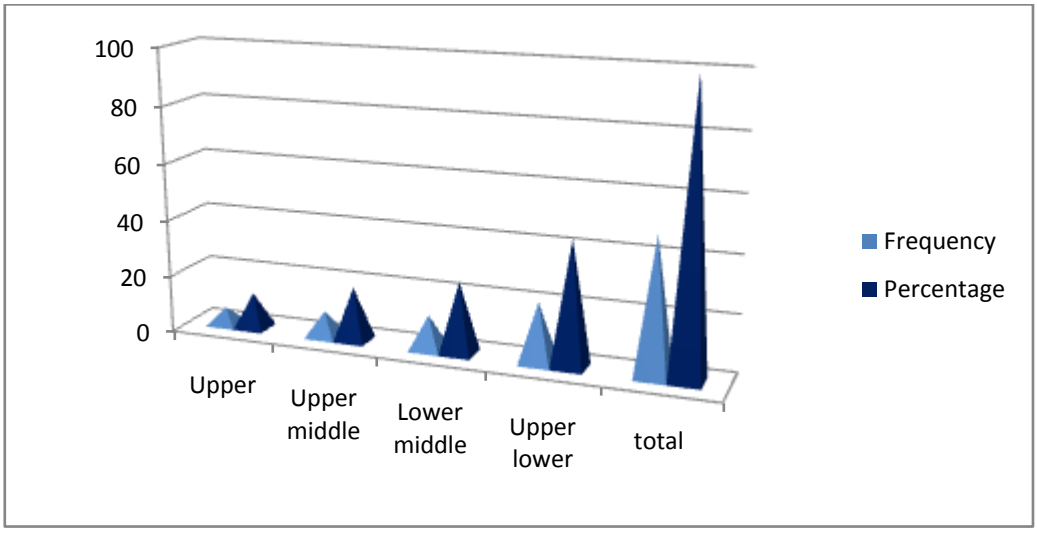

FIGURE 7: SOCIO-ECONOMIC STATUS OF DEMENTIA PATIENTS.

TABLE 8: DEPICTION OF SUBTYPES OF DEMENTIA

Typeofdementia	Frequency	Percent
Alzheimer's disease	18	56.3
Vascular dementia	9	18.8
Lewy body dementia	3	6.3
Fronto-temporal dementia	3	6.3
Beclouded dementia	3	6.3
Subcortical dementia	3	6.3
Total	48	100.0

Out of 48 patients the common type of dementia reported was alzheimers disease found in ,56.3% of the cases followed by vascular dementia which is found in 18.8% of the cases followed by lewy body dementia , fronto-temporal dementia and beclouded dementia and sub cortical dementia , which were found to be 6.3 % each.

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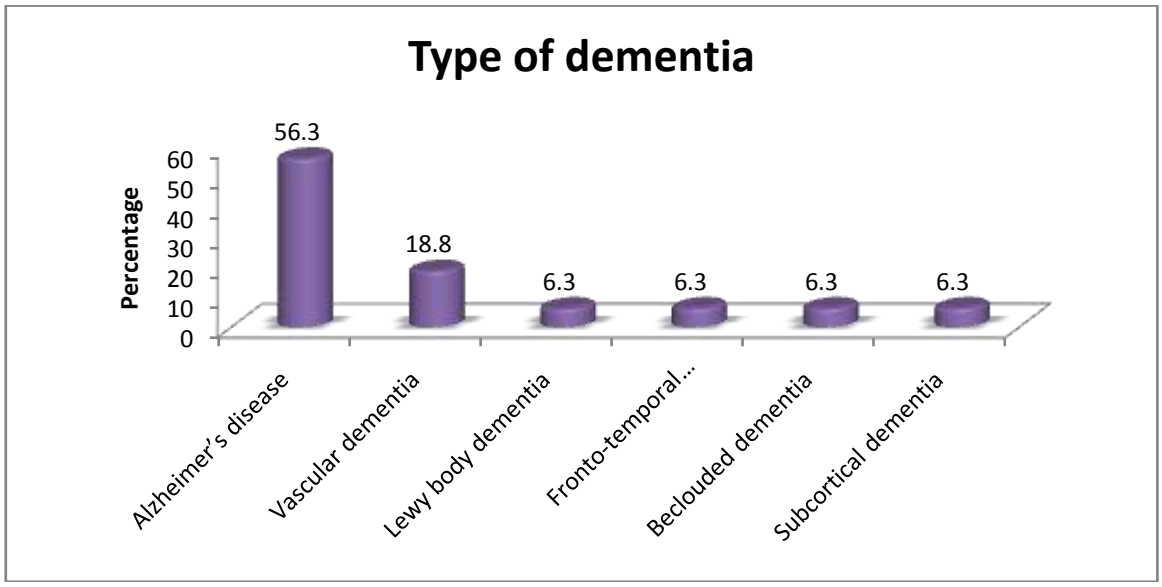

FIGURE 8 :DEPICTION OF SUBTYPES OF DEMENTIA

TABLE 9 :SYMPTOMS OF DEMENTIA

Symptoms	Frequency	Percentage
Forgetting recent events	48	100.0
Unaware of time and place	30	62.5
Difficulty in recognizing relatives	33	68.8
Difficulty in performing familiar task	15	31.3
Lost in familiar places	21	43.8
Poor concentration	12	25.0
Difficulty in communication	9	18.8
Difficulty in walking	12	25.0
Disturbed sleep	6	12.5
Loss of interest	3	6.3
Behavioural changes	9	18.8
Poor judgment	0	0
Mood swing	24	50.0

According to our study we have found out that the most presenting symptom is forgetting recent events with a percent of 100, 62.5% of unaware of time & place, 68.8% of difficulty in recognising relatives, 31.3% of difficulty in performing familiar task, 43.8% of lost in familiar places, 25% of poor concentration, 18.8% of difficulty in communication, 25% of difficulty in walking, 12.5% disturbed sleep, 6.3% of loss of interest , 18.8% of behavioural changes, 50% of mood swings & also there were no patients presenting with poor judgement.

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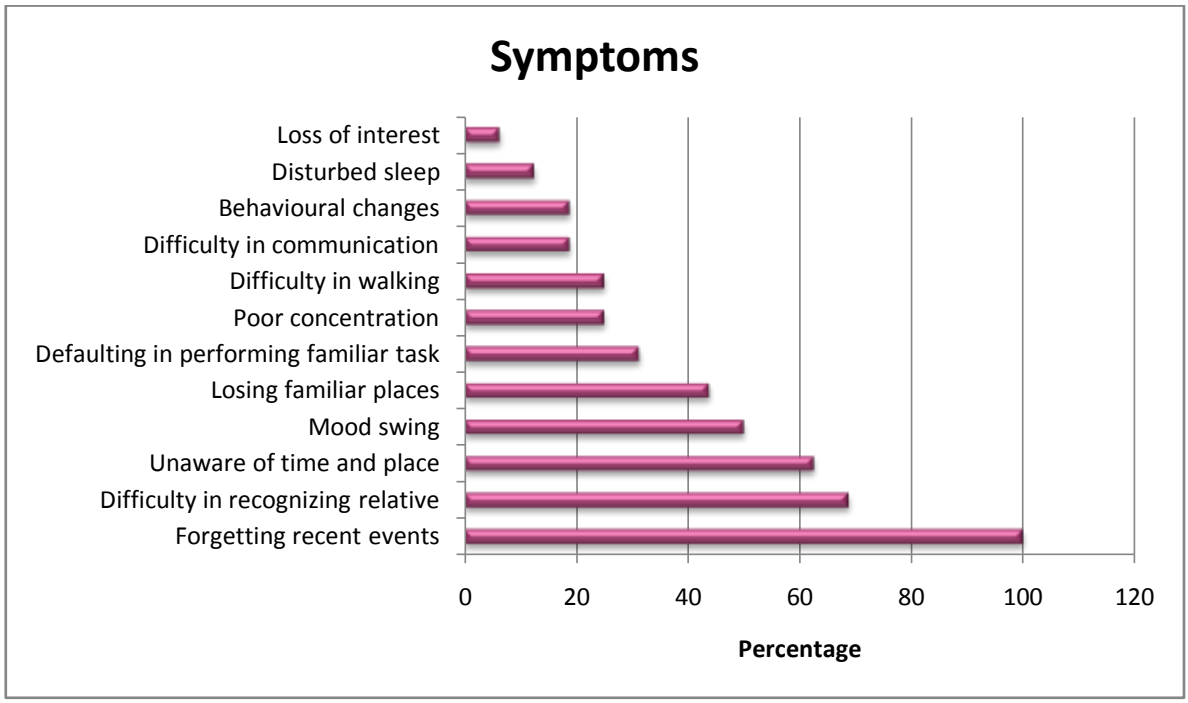

FIGURE 9: SYMPTOMS OF DEMENTIA

TABLE 10 : REPRESENTATION OF COMORBIDITY DISTRIBUTION OF DEMENTIA PATIENTS

Comorbidities	Frequency	Percentage
HTN	36	75.0
DM	36	75.0
CAD	12	25.0
Dyslipidemia	9	18.8
Thyroid	0	0.0
Surgery	15	31.3
Liver disease	0	0.0
Kidney disease	3	6.3
Seizure	0	0.0
Parkinsonism	6	12.5

Distribution of different comorbidities associated with dementia patients is represented in figure 10. Regarding the comorbidity pattern in dementia patients, it was observed that hypertension and diabetes were found to be the most common type of comobidity. This is about 75 % each , which is followed by surgery and CAD 31.3% and 25% respectively . Followed by dyslipidemia 18.8% , parkinsonism 12.5% and kidney disease 6.3%.None of the patients were having liver disease , thyroid disease or seizure.

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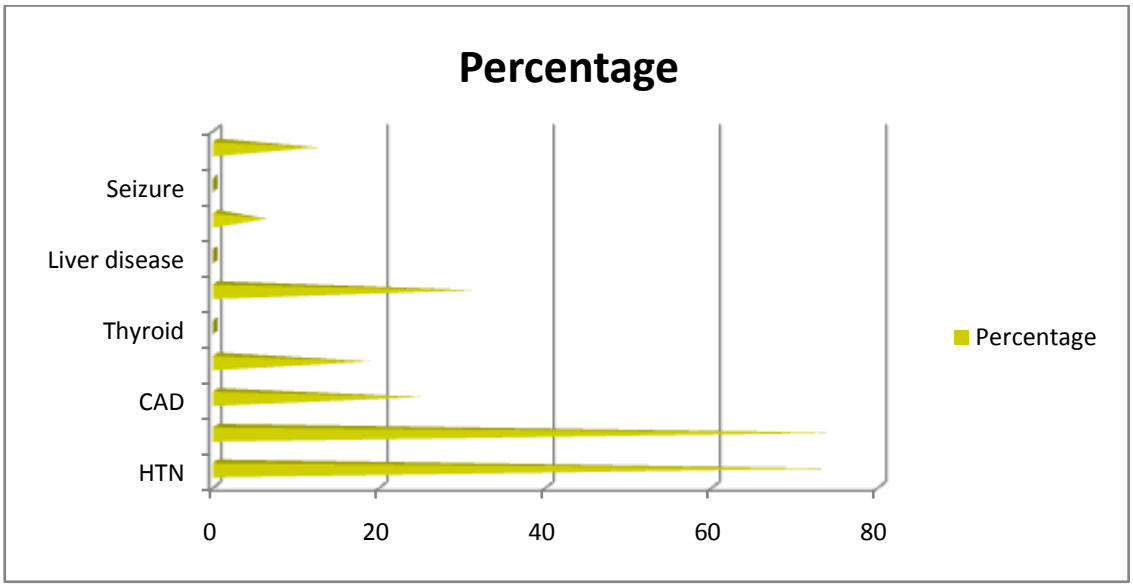

Figure 10: REPRESENTATION OF COMORBIDITY DISTRIBUTION OF DEMENTIA

TABLE 11 : : REPRESENTATION OF PSYCHIATRIC COMORBIDITY DISTRIBUTION OF DEMENTIA

Psychiatric Co morbidities	Frequency	Percentage
Depression	18	37.5
Anxiety	27	56.25
NIL	3	6.25

In total of 48 cases it was observed that 37.5% of patients was having depression and 56.25% patients was found to have anxiety , 6.25 % of patients were having neither depression or nor anxiety.

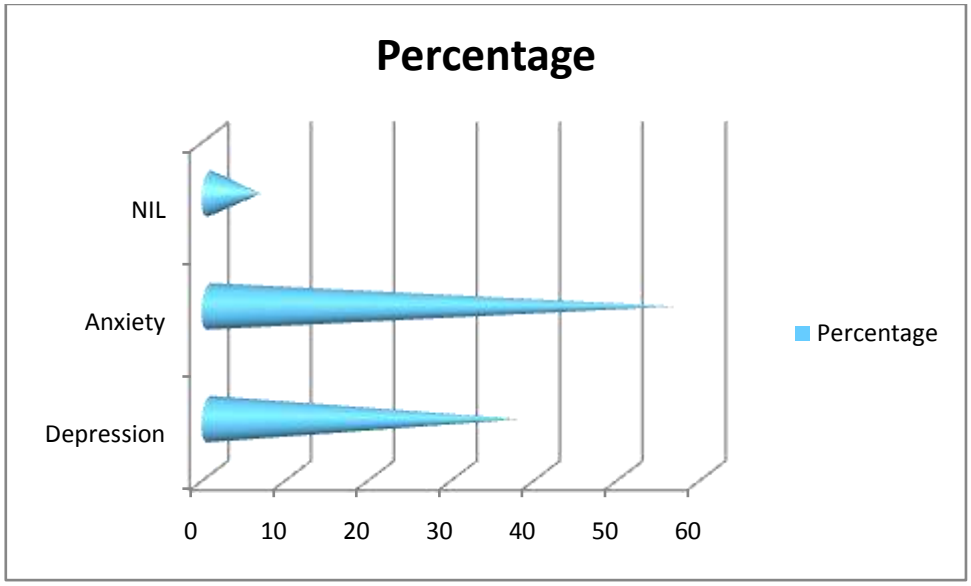

Figure 11 : REPRESENTATION OF PSYCHIATRIC COMORBIDITY DISTRIBUTION OF DEMENTIA

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TABLE 12: DEPECTION OF DOSE DISTRIBUTION OF DIFFERENT DRUGS USED IN DEMENTIA

			Dose					
			5mg		10 mg		1.5 mg	
Drug	NO OF PATENTS	%	NO .OF PATIENTS	%	NO. OF PATIENTS	%	NO. OF PATIENTS	%
Memantine	30	62.5	9	18.8	21	43.8	0	0
Donepezil	21	43.75	9	18.8	12	25.0	0	0
Rivastigmine	9	18.75	0	0	0	0	9	18.8

Prescription analysis of dementia patients depicts that most popular drug of choice for the given condition wasMemantine in a dose range of 5 to 10 mg. The doses of drugs used were 5mg dose in 18.8% of cases and 10mg dose in 43.8 % of cases inMemantine, which is followed by Donepezil in a dose range of 5 to 10 mg. The doses of drugs used were 5mg dose in 18.8% of cases and 10mg dose in 25.0% of cases inDonepezil ,while for Rivastigmine it was 1.5mg dose in 18.8 %

TABLE 13 : PRESCRIBING PATTERNS IN DEMENTIA PATIENTS

Drugs	Frequency	Percentage
Memantine	12	25
Donepezil	18	37.5
Memantine+ Donepezil	9	18.75
Rivastigmine	6	12.5
Memantine+ Rivastigmine	3	6.2
Total	48	100

In this study NMDA receptor antagonist ,Donepezil (37.5%) is the prescribed drug for most of the dementia cases followed by Memantine (25%), Memantine + Donepezil combination (18.75%), Rivastigmine (12.5%), Memantine + Rivastigmine combination (6.2%).

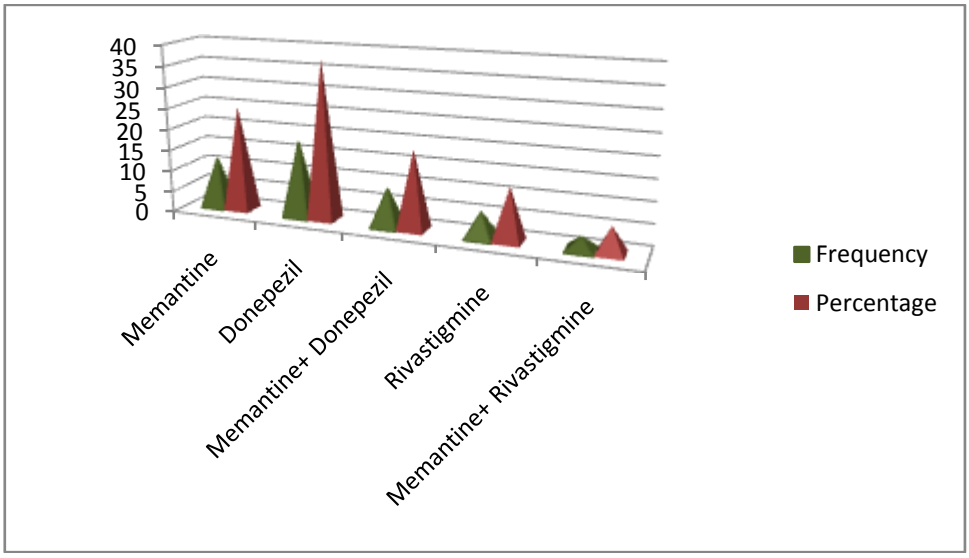

FIGURE 12 : PRESCRIBING PATTERNS IN DEMENTIA PATIENT

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TABLE 14 : SLUMS SCORE OF DEMENTIA PATIENTS

SLUMS score	Frequency	Percentage
MCI	3	6.3
Dementia	45	93.8
Total	48	100.0

SLUMS scale was conducted to determine whether the patient having dementia or mild cognitive impairment .According to the criteria , about 93.8% patients was found to have dementia and 6.3 % having mild cognitive impairment.

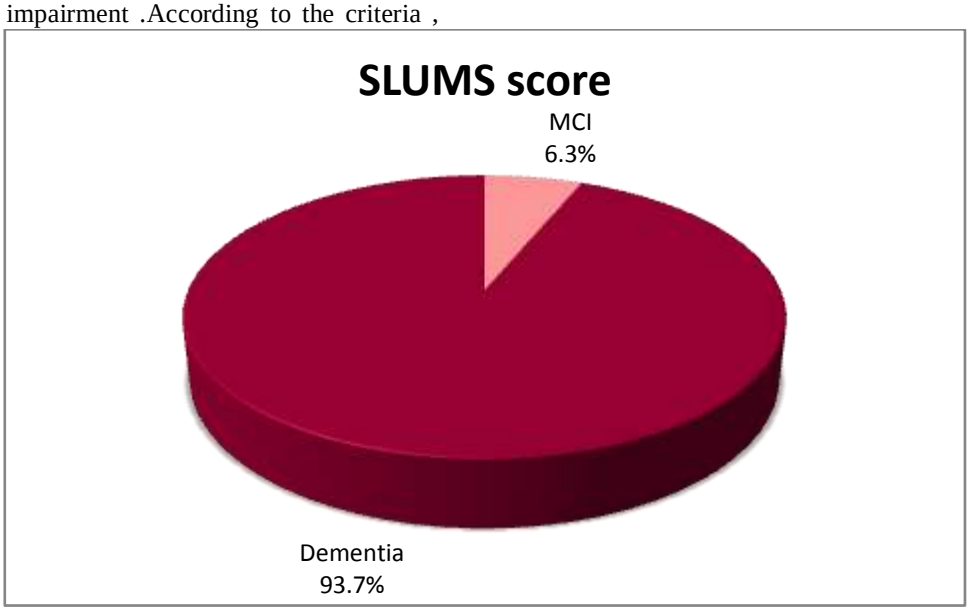

FIGURE 13 : SLUMS SCORE OF DEMENTIA PATIENTS

TABLE 15 :DSRS score of dementia patients.

DSRS	Frequency	Percentage
Mild	15	31.3
Moderate	24	50.0
Severe	9	18.8
Total	48	100.0

Dementia severity rating scale was conducted to determine the severity of dementia.50 % of patients was observed to have moderate dementia followed by 31.3% patients with mild dementia and 18.8% patients with severe dementia.

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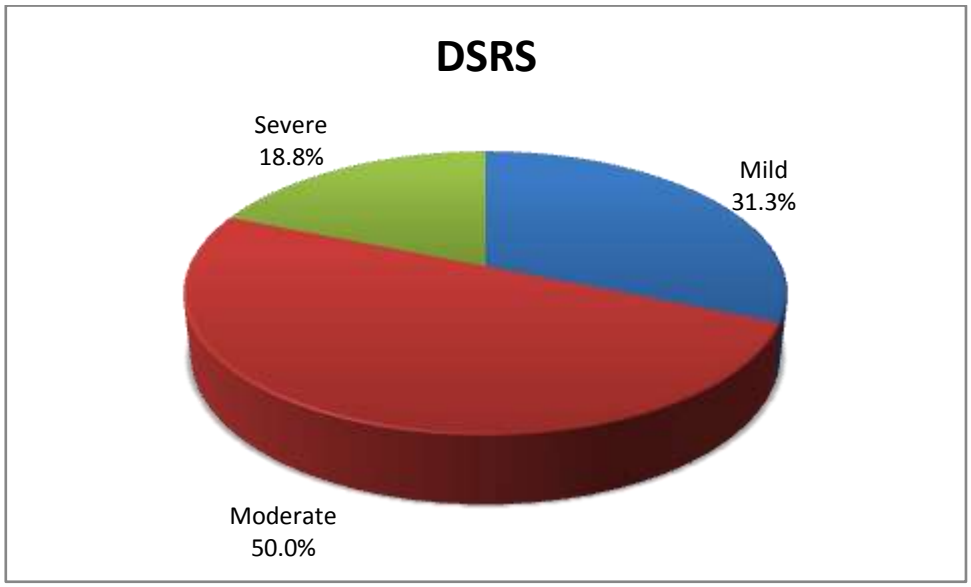

FIGURE 14: DSRS score of dementia patients

TABLE 16: HADS SCORE IN DEMENTIA PATIENTS

HADS	Frequency	Percentage
Depression	18	36.5
Anxiety	27	56.25
Nil	3	6.3

Was conducted in patients to assess the psychiatric comorbidity ,In total of 16 cases it was observed that 37.5% of patients was having depression and 56.25% patients was found to have anxiety , 6.25 % of patients were having neither depression or nor anxiety

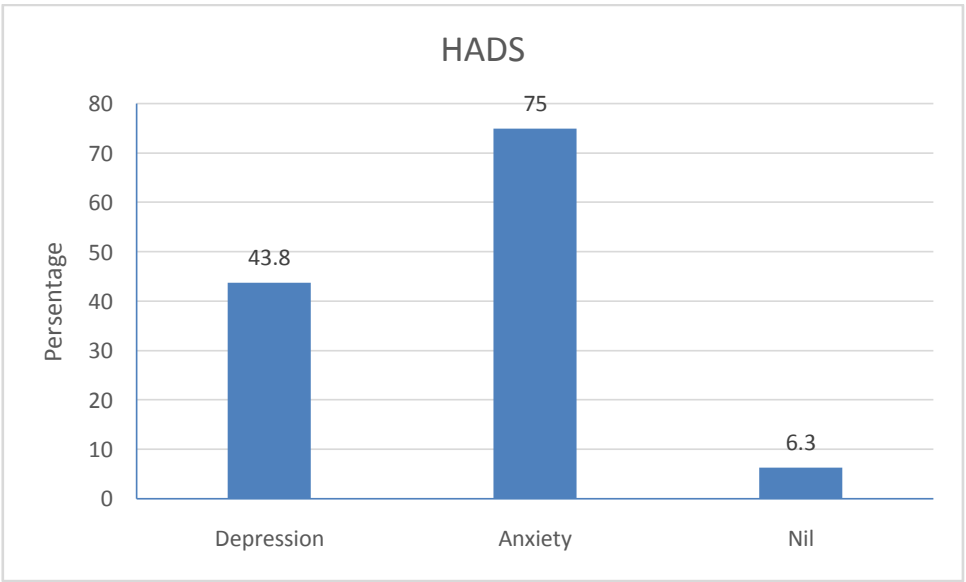

FIGURE 15 : HADS SCORE IN DEMENTIA PATIENT

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DISEASE SEVERITY BEFORE AND AFTER TREATMENT

	DSRS score		Paired t test
	mean	sd	p
Before treatment	30.36170213	96.93154487	0.00
After treatment	27.17021277	92.0573543	

TABLE :17Disease severity before and after treatment

Disease severity before treatment was 30.36 ± 96.93 and after the treatment was 27.17 ± 92.05.The observed difference was statistically significant ($p<0.05$). There was a significant improvement in disease after the treatment.

IV. DISCUSSION

Dementia is one of the most disabling disorders affecting adult and elderly population reaching to epidemic proportions of an estimated 4.6 million new cases worldwide each year.Dementia is observed in elderly throughout the world but they are poorly recognized and treated in developing countries including India [7]. The disease important since there are an estimated 35.6 million people with dementia worldwide and more than half of these individuals have Alzheimer's disease (AD)[8-11] . It is expected that burden of dementia will be increasing in developing countries due to increase in longevity and increase in prevalence of risk factors such as hypertension and stroke. More than half of these individuals have Alzheimer's disease (AD) which results in progressive decline in cognitive function ,communication and together with the frequent occurrence of neuropsychiatric symptoms. [10, 4] Drug utilization evaluation is defined as an ongoing authorized and systematic quality improvement process which is designed to review drug use, provide feedback of results to clinicians and other relevant groups, develop criteria and standards which describes optimal drug use and promote appropriate drug use through education and other interventions. [11]. The prescription pattern of drugs used in dementia has not been studied much in developing countries where cost may be the most important factor which determine the choice of the study. In this study, we highlight the present Indian scenario of dementia in relation to its severity, psychiatric comorbidities, and drug utilization in this particular region.

In our study , average age of the study population was 79.9 ± 6.1 and age ranges from 69-89 years ,12.5% of the patients were in the age group ≤70 years, 6.3% were 71-75 years,31.3% were in the 76 -80 years and 81-85 years and 18.8 % >86 years. In the gender distribution males dominated in the study population which is 56.3% while in females it is 43.8%.In a study conducted by Mansi et al reports the mean age of patients to be 72 ± 2.01, 70.02% of the population in our study was found to be geriatric population and males dominated the study population(60.57%)[14]. In one of the similar study conducted at multiple centers by Gil-N´eciga and Gobartt, it was found that the mean age of patients was 77 ± 6.6 years and that female dominated the study population [34].On contrary, in the study done by Jeschke et al. during the 5-year study period (2004–2008), in 577 patients with dementia , 81 years was found to be the median age of the patient and females dominated the study population which is, 69% [24]. The comparatively lower population of dementia patients in our study might be due to the less preference given to females in the Indian community and therefore
neglected and not brought to the hospitals when treatment is essential. In the study it was noted that it was noted that 56.2% of the patients were college graduates,12.5% of the patients were high school graduates,12.5% were higher secondary graduates and 12.5% were post graduates and 12.5% of the patients were illiterate.In a similar study conducted by Mansi et al, it was noted that almost 8.0% of the patients were illiterate. A total of 56.0% of the patients were high school graduates .The percentage of population who were graduates was 24.0% while postgraduates were very less 12.0%. However regarding the Socioeconomic status most of the patients belongs to lower socioeconomic status which may be one of the important risk factors responsible for dementia [14]. In this study it was noted that 43.8% of the patients were of upper lower class, 43.8% were of upper middle class, 25% of the patients were of lower middle class and 18.8% of the patients were of upper class.

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In a study conducted by Qian et al. found that individuals with lower socioeconomic status come into memory clinic after the disease has progressed to dementia, while higher socioeconomic status individuals present earlier when the disease is still in its mild cognitive impairment stage. They concluded that higher socioeconomic status is associated with better cognitive functioning and increased use of cognitive enhancers [15]. In the present study we found that amongst the types of Dementia the common type of dementia reported wasAlzheimers disease found in ,56.3% of the cases followed by vascular dementia which is found in 18.8% of the cases followed by lewy body dementia , fronto-temporal dementia and beclouded dementia and sub cortical dementia , which were found to be 6.3 % each.

In the study done by Mansi et al they found that amongst the types of Dementia Alzheimer's disease was the most common type in 65.6% of the cases,(Mean age= 72 ± 1.2 years) followed by, Vascular dementia which was found in 21.6% cases (Mean Age= 70 ± 0.1 years),followed by Fronto temporal dementia [14]. .In a clinic-based study from South India also depicts similar results, in which Alzheimer's disease was found to be the commonest in 38.3% of the cases, vascular dementia in 25.4%of the cases, followed by fronto temporal dementia (FTD) in18.7%, Lewy body disease (DLB) in 8.9%, and mixed dementia in 8.6% of the patients, respectively [16]. Regarding the comorbidity pattern in dementia patients, it was observed that hypertension and diabetes were found to be the most common type of comobidity. This is about 75 % each , which is followed by surgery and CAD 31.3% and 25% respectively . Followed by dyslipidemia 18.8% , parkinsonism 12.5% and kidney disease 6.3%.None of the patients were having liver disease , thyroid disease or seizure and Similarly in the study done by Lincy Joseph et al reveals that majority of them had one or more co-morbidities like diabetes mellitus (76.8%) and hypertension (71.4%)[17]..A study reported by Poblador-Plou et al. also found similar results, where the two most frequent comorbidities both for men and women with dementia were hypertension and diabetes. Other comorbidities significantly associated with dementia were Parkinson's disease, congestive heart failure, cerebrovascular disease, anemia, cardiac arrhythmia, chronic skin ulcers, osteoporosis, thyroid disease, retinal disorders, prostatic hypertrophy, insomnia and anxiety, and neurosis [35] .In the present study it was observed that it was observed that 37.5% of patients was having depression and 56.25% patients was found to have anxiety , 6.25 % of patients were having neither depression or nor anxiety.

In this study NMDA receptor antagonist ,Donepezil (37.5%) is the prescribed drug for most of the dementia cases followed by Memantine (25%), Memantine + Donepezil combination (18.75%), Rivastigmine (12.5%), Memantine + Rivastigmine combination (6.2%). In the study conducted by Lincy Joseph et al reveals that Donepezil (57.14%) and combination of donepezil with memantine (42.9%) were found to be themost prescribed anti-dementia drug in patients with mild to moderate dementia[17] . Also in a study done by KaranThakker et al the most commonly prescribed Cognition enhancer drugs, were Donepezil and Memantine [21].

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