Clinical Spectrum- Cognition, Stages, Functionality among Elderly with Dementia: A Cross-Sectional Study

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ABSTRACT

Introduction: Although cognitive and functional impairment are the hallmark features of Dementia but it is often undetected and neglected as a normal part of aging. So we conducted this study on clinical profile of dementia patients. **Aim**: The aim of this study is to evaluate the Patient's cognitive impairment, functional capacities, and stages of severity of dementia. **Methods:** A descriptive cross sectional study was conducted among 50 patients aged 60 years and above, of both sexes with the diagnosis of Dementia, admitted in Medicine ward of Nepalgunj Medical College, Nepalgunj, Nepal. The screening of dementia was done using Mini-Mental State Examination tool and the diagnosis of Dementia was confirmed using the International Classification of Disease-10 Diagnostic Criteria for Research. Cognition, functionality and stages of severity of dementia were assessed using Hierarchic Dementia Scale, Functional Autonomy Measurement System, Functional Assessment Staging Test tools respectively. **Results:** Among a total of 50 dementia patients, the mean and standard deviation of age was 82.4**±6.1 years, majority of cases** 60 % were in the age group ≥85 years and most patients were female 56%. The mean Mini-Mental State Examination score was 9.6±3.0, and 50 % had severe impairment of cognition on Hierarchic Dementia Scale. Stage 7 dementia 32 % was most prevalent stage on Functional Assessment Staging and severe deterioration in the functional autonomy was seen in 54% dementia patients (score ≥41 on Functional Autonomy Measurement System). **Conclusion:** This study concludes that significant number of elderly patients attending tertiary care hospital suffers from dementia with severe impairment in cognition and functionality in various stages of dementia in the elderly patients.

Keywords: **Alzheimer's disease, Cognition, Dementia, Mini Mental State Examination, Neurocognitive disorders**

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INTRODUCTION

Dementia also referred as Neurocognitivedisorders (NCDs) is adegenerative disease of brain characterizedby progressive impairment of memory, communication skills, planning and personalorganizational ability, and social skills leadingto the progressive decline in the activities ofdaily living and loss of independence. Thecognitive deficits interfere with independencein everyday activities of daily living providinggreat burden for the family members or caretakers.[1]

The most common form of dementia is Alzheimer's disease (AD), accounting for 60 to 80% of dementia cases. Vascular dementia (VaD), which occurs after a stroke, is the second most common form, accounting for about 10% of cases. Other types include mixed dementia, dementia with Lewy bodies, and frontotemporal dementia.[2] Dementia is mostly diagnosed in people over 65 years, but a less prevalent early onset form sometimes develops at earlier age group.[3] Dementia leads to patient's unusual behaviors, aggression, agitation, forgetting, repetitive questions, culturally inappropriate behaviors, sexual disinhibition, and/or shadowing.[4] The progressive course of dementia might be classified in three main stages: mild stage- there is still some aptitude for independent life, despite the impact on instrumental activities of daily living; moderate stage- the abilities for independent living are limited and supervision is needed in many activities; severe stage- restricted independence for all activities, including personal hygiene, limited language skills, sometimes with mutism, and often apathy.[5] Cognitive impairment, even in the mild stages, is a major cause of disability in dementia.[6]

Functional decline, defined as deterioration in self-care skills, is a common and devastating problem for elderly patients with dementia.[7, 8] It is associated with prolonged hospital stay, increased mortality, higher rates of institutionalization, and greater health care expenditure. Recent studies suggested that 34 to 50% of elderly patients experienced functional decline in dementia.[9,10] The prevalence of dementia is increasing

globally.[11,12] It approximately doubles every 5 years in individuals aged 65 to 85 years; from approximately 1% to 2% at 65 years, to more than 30% to 50% by age 85 years.[11] About 46.8 million persons suffer from dementia worldwide.[13] This number is expected to increase to 74.7 million persons by 2030 and to 131.5 million by 2050.[14] In Nepal except hospital based study we don't have prevalence data butbased on elderly population withat least 5% prevalence of Dementia among 2.7 million elderly populations in the country as per2011 National census it can be estimated thatthere can be at least 135,000 people suffering fromdementia.[15]The hospital based study conducted in outpatient departmentin Kathmandu, Nepalhad shown prevalence of dementia as 11% of which 6% was vascular dementia and 5% Alzheimer's dementia.[16], while another study done in a tertiary-care hospital in eastern Nepal in elderly had reported prevalence of dementia as 6%.[17]

Most studies employ superficial screening tests and rarely monitor functionality or qualitative aspects in dementia patients.[18, 19]Only a few studies have used a performance-based measure, in which the patient is actually observed and objectively rated on his or her ability to perform various activities of daily living.[20]In view of the scarcity of studies done in Nepal that precisely evaluate cognitive and (performance-based) functional abilities of dementia patients, we conducted this study on clinical profile of dementia patients with the aim to evaluate their cognitive impairment, functional capacities, and stages of severity of dementia.

METHODS

This was a descriptive cross-sectional study conducted among 50patients of aged 60 years and above, of both sexes with the diagnosis of Dementia, admitted in Medicine ward of Nepalgunj Medical College, Nepalgunj, Banke, Nepal, from 25th May 2018 to 25th May 2020 following all appropriate institutional ethics committee clearances. Informed consent was taken from the patients and when they were not able to provide consent because of disease severity, the consent was taken from their relatives. For inclusion, each patient who had scored 24 on the traditional Mini-Mental State Examination–MMSE[21]and who fulfilled the ICD-10 DCR[22]criteria for the diagnosis of Dementia, were enrolled into the study. A self-designed semi structured questionnaire was used to obtain the socio-demographic characteristics of the study population.

Each patient after initially scored on MMSE,were then screened for an accurate stratification of cognition using Hierarchic Dementia Scale (HDS).[23]This instrument consists of 20 subscales assessing a broad spectrum of cognitive abilities. The subscales comprise either five or 10 items in decreasing order of difficulty. On each subscale, the maximum score is 10, which suggests no impairment. Results between 7 and 9 suggest mild impairment; results between 4 and 6 suggest moderate impairment; finally, results between 0 and 3 suggest severe impairment. The maximum total score on the HDS is 200 points. Older adults who are cognitively intact generally achieve the maximum or close to maximum score.[24] Even patients with severe dementia are often able to answer correctly the easiest items on the lower end of a subtest.[25] The validity and reliability of the scale are well established.[26]

Stages of severity of dementia wereassessed by the Functional Assessment Staging Test–FAST,[27] a hierarchical scale consisting of 16 items. Scores range from normality (FAST stage 1) to severe dementia (FAST stage 7). FAST stages 6 and 7 are subdivided into five and six sub stages, respectively.Reliability andvalidity studies have been performed and showed satisfactory results.[28]

To evaluate the patient's functional capacities, the Functional Autonomy Measurement System (SMAF) was administered.[29]This 29-item scale measures functional ability in five areas: activities of daily living (ADL: 7 items), mobility (6 items), communication (3 items), mental functions (5 items) and instrumental activities of daily living (IADL: 8 items). The disability for each item is scored on a 5-point scale: 0 = independent, 0.5 = with difficulty, 1 = with supervision, 2 = with help and 3 = dependent. Higher score is indicative of severe autonomy impairment.This version of the scale has shown good test-retest and inter-rater reliability.[30]Data were analyzed using SPSS version16 (Chicago, Illinois, USA). Descriptive analysis was performed.

RESULTS

Among a total of 50 dementia patients (Alzheimer's dementia 44 (88%) and Vascular dementia 6 (12%) included in this study, females 28 (56%) outnumbered males22 (44%). The mean and SD of age of patients was 82.4 **±6.1** years, majority of cases 60 % were in the age group 85 years and above.Dementia was found more than 3 times higher in rural populations (78%) than in urban populations (22%).The risk of dementia was considerably higher among those with no formal education (62%), compared to those with primary (18%) or secondary (12%) or Higher secondary/above (8%). There was a considerably higher prevalence of dementia among respondents who were unemployed (60%) compared to those who were employed/retired (40%). (Table-I)

Variables		Frequency % n=50
Age in years	65–74	8 (16%)
	75–84	12 (24%)
	≥ 85	30 (60%)
Gender	Male	22 (44%)
	Female	28 (56%)
Residence	Urban	11 (22%)
	Rural	39 (78%)
Education	Illiterate	31 (62%)
	Primary	9 (18%)
	Secondary	6 (12%)
	Higher Secondary and above	4 (8%)
Occupation	Employed or retired	20 (40%)
	Unemployed	30 (60%)

Table I : Distribution on the basis of socio demographic variables

Regarding screening for cognition, initial traditionalMMSE mean result was 9.6±3.0. Then the further stratification of cognition using Hierarchic Dementia Scale-HDS showed 25 (50%) patients had severe impairment of cognition.More than two third of the dementia patients 27 (54 %) showed severe deterioration in their functional autonomy (score ≥41 on the Functional Autonomy Measurement System-SMAF). (Table-II)

Variables		Frequency % n=50
Cognition (HDS)	0-3 (Severe impairment)	25 (50%)
	4-6 (Moderate impairment)	16 (32%)
	7-9 (Mild impairment)	9 (18%)
Functionality (SMAF)	0-29 (No to mild dependency)	8 (16%)
	29.1- 40 (Moderate dependency)	15 (30%)
	≥ 41 (Severe dependency)	27 (54%)

Table II : Distribution on the basis of Cognition and Functionality

The different categories of stages of dementia in Functional Assessment Staging Test-FAST showed that the stage 7 dementia 32% was the most prevalent stage of dementia. Results can be seen in Table-III.

Stages of dementia (FAST)		Frequency % n=50
Mild dementia	Stage 4 (IADLs becomes affected)	9 (18%)
Moderate dementia	Stage 5 (Needs help selecting proper attire)	15 (30%)
Moderately Severe dementia	Stage 6	10 (20%)
	6a (Needs help putting on clothes)	5 (10%)
	6b (Needs help bathing)	3 (6%)
	6c (Needs help toileting)	2 (4%)
Severe dementia	Stage 7	16 (32%)
	7a (Speaks 5-6 words during day)	12 (24%)
	7b (Speaks only 1 word clearly)	4 (8%)

Table III : Distribution on the basis of Stages of dementia

DISCUSSION

In our research among a total of 50 patients, dementia prevalence increased with age, mean age of presentation was 82.4±6.1 years. The figure rose from 16% for patients younger than 74years, 24% for younger than 84years to 60% for 85 years and beyond of age. This was consistent with the results of previous studies pointing out the association between age and prevalence of dementia.[31, 32]

The most common form of dementia in our study was Alzheimer's dementia (88%) followed by Vascular dementia (12%). Various epidemiological and clinical studies have reported AD as the most common cause of dementia followed by VaD.[33]

In the present study, 56% of patients with dementia were females while 44% were males. This result is in line with the findings of the majority of the previous research, which have reported higher rates of dementia in women. Similar gender differences were also reported in many studies.[34,35] The interaction between genes, hormones, and the social environment may be the main reasons for this difference between genders.[33] As life expectancy for women is higher than men and age is major risk factor for dementia, soincidence of dementia is higher in women[36]

Dementia was found more than 3 times higher in rural populations (78%) than in urban populations (22%) in our study. Many studies reported the association between living in rural place and risk of dementia. This may be due to the fact that patients from rural background were less educated as compared to urban and low level education has a higher risk of cognitive decline and dementia in people living in rural areas.[37,38]

The risk of dementia in our study was seen considerably higher among those with no formal education (62%), compared to those with primary (18%) or secondary (12%) or Higher secondary/above (8%). This is comparable to other studies which also suggest that higher education levels are associated with a reduced risk of cognitive decline and dementia.[39] The effect of education on the cognitive decline can be explained using the 'cognitive reserve hypothesis' with a positive correlation that a low level of education is related to an increased incidence of dementia.Mental and intellectually challenging activities involved in educational and complex mental activities is recognized as having a powerful role in maintaining or enhancing brain reserve and is thus protective against the risk of dementia in old age.[40]

Another point we would like to highlight about this study is that the rate of dementia prevalence was significantly lower among employed or retired individuals (40%) than unemployed patients (60%). Several studies have shown that not having an active job throughout one's life increases the risk of dementia due to a reduction in cognitive reserves.[41]

In our study the cognitive abilities assessedusing Hierarchic Dementia Scale showed 50% patients had severe impairment of cognition which is in line with the previous research where severe deficits in cognitive function was reported in dementia patients as assessed by HDS tool.[42]

The functional capacities of patients in our study wasseverely impaired, more than two third of the dementia patients 27 (54 %) showed severe deterioration in their functional autonomy (score ≥41 on the Functional Autonomy Measurement System-SMAF).Some cross-sectional studies have noted greater prevalence rates offunctional declineassociated with increasing age among older persons with dementia.[43,44,45]

The different categories of stages of dementia in Functional Assessment Staging Test-FAST in our study showed that the stage 7 dementia 32% was the most prevalent stage. These findings have been consistent with a study done in Korean patients, which elucidated 46% patients at Functional Assessment Staging Scale (FAST) stage 6d or above.[46] Similar results noted in other studies.[47,48]

LIMITATIONS

The findings in this study are based on a single center outpatient based samples, so generalization to other settings might not be appropriate. A larger sample size may be helpful to confirm the contributing factors. So, if we want to produce more accurate conclusion for our present study, we need to carry out this study over large number of samples from different regional part of Nepal. Further studies should be conducted with different samples using alternative measures, with the aim to find the same correlations or new results through the application of different statistical techniques.

CONCLUSION

This study concludes that significant number of elderly patients attending tertiary care hospital suffers from dementia with severe impairment in cognition and functionality. It shows the importance for clinical, multidisciplinary teams along with adequate diagnostic modalities to understand the stages of the dementia with progressive decline in cognitive and functional capacities which may help in a timely diagnosis and may direct future developments with regard to specific techniques to deal with dementia patients.

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