A FOLLOW UP STUDY OF USE OF MEMANTINE ON COGNITIVE FUNCTIONS AND LEVEL OF DEPENDENCY OF PATIENTS WITH ALZHEIMER'S DEMENTIA

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ABSTRACT

Objective: To evaluate the effect of Memantine on cognitive functions and level of dependency of patients with Alzheimer dementia.

Methodology: This descriptive study was conducted at department of Psychiatry, Lady Reading Hospital Peshawar from February to June 2012. Sample consisted of 55 patients; both male and female and were included through consecutive sampling. Patients were assessed at baseline and at three months follow up for Cognitive functions and level of dependency with the use of Mini Mental State Examination (MMSE) and Clifton Assessment Procedures for the Elderly (CAPE) as psychometric tools.

Results: Fifty five patients with Dementia were included in the study. Forty three patients completed their follow up visits. Mean score of the patients who completed follow up on MMSE at baseline was 17.47±6.04, while mean dependency grade of CAPE at baseline was 3.67±1.44. Mean score on MMSE at follow up was 19.67± 5.88 while mean dependency grade of CAPE was 2.67±1.39. Significant difference was found between the scores on base line and follow up with the p=0.00.

Conclusion: We concluded from our study that Memantine has useful role in the improvement of the cognitive functions and behavioral dependency of the demented patients as there were significant improvements seen in both cognitive functions and level of dependency of the patients with Alzheimer dementia after 3 months follow up assessment.

Key Words: Dementia, Memantine, Mini Mental State Examination (MMSE), Clifton Assessment Procedures for the Elderly (CAPE)

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INTRODUCTION

Dementia is characterized by deterioration of memory with impairment in other domains including speech, recognition and executive function. There is worsening in level of function which interferes with daily life [1]. Health professionals should be able to correctly diagnose and manage the early manifestations of dementia especially as new pharmacological options are available.

A population of 35.6 million people is estimated to be affected with dementia all over the world and this figure would increase twofold by 2030 and more than threefold by 2050. Dementia is the fourth leading cause of disease burden (in terms of disability adjusted life years) in high income countries[2]. Alzheimer disease (AD) is the most common type of dementia, which accounts for 60 to 80 percent of total cases [3-6]. The percentage of vascular dementias is about 10 to 20 percent while Parkinson Disease associated Dementia accounts for 5 percent. Vascular Dementia is more prevalent in Blacks, hypertensive people, and patients with diabetes mellitus while prevalence of the reversible dementias (e.g. metabolic dementias) is higher in younger individuals. A large proportion of population acts as caregivers for these patients which includes partners, relatives and friends[7].

Memantine is an N-methyl-D-aspartate (NMDA) receptor antagonist which seems to be neuroprotective. The principal excitatory amino acid neurotransmitter in cortical and hippocampal neurons is Glutamate which

activates one of the NMDA receptor involved in learning and memory[8, 9]. Ischemia can induce excessive NMDA stimulation leading to excitotoxicity, which suggests that agents that block stimulation of NMDA receptors might be protective against further damage vascular dementia (VaD) [10]. The physiologic function of the remaining neurons could also be restored, leading to symptomatic improvement [11].

Alzheimer disease (AD) patients have reduced acetylcholine synthesis and impaired cortical cholinergic function. Cholinesterase inhibitors increase cholinergic transmission by inhibiting cholinesterase leading to increased availability of acetylcholine. Tacrine, Donepezil, Rivastigmine, and Galantamine are the four cholinesterase inhibitors which have been used[12].

There is no specific definition of moderate to severe AD but patients with Mini-Mental State Exam (MMSE) scores between 10 and 20 are usually considered as having moderate AD.

Memantine appears to be effective in patients with moderate to severe AD and improves patient's ability to perform everyday activities and reduces distressing behavior.

The basic aim of this study was to find out effects of Memantine on cognitive function and quality of daily living and dependency levels.

METHODOLOGY

This descriptive study was carried out at Psychiatry unit of Lady Reading Hospital Peshawar from February to June 2012 including all the patients meeting the criteria. An International Classification of Disease 10th Edition (ICD-10) criterion for the diagnosis of Alzheimer's Dementia was used in this study and patients were selected through consecutive sampling. Patients with Vascular, Lewy body and Frontotemporal dementia were excluded from the study. Also patients with Pseudo dementia were not included in the study.

Age of the patients was confirmed through their national identity card while rest of the demographic profile was attained through semi structured interview. Investigations were carried out to exclude other causes of dementia which comprised of Serum B12, Folate, Thyroid function tests and CT Brain.

The Mini-Mental State Exam (MMSE) is the most widely used cognitive test for dementia. It tests a broad range of cognitive functions including orientation, recall, attention, calculation, language manipulation, and constructional praxis.

Clifton Assessment Procedures for the Elderly (CAPE) is an assessment tool designed to assess quality of life and physical and cognitive dependency levels in the elderly people with dementia.

MMSE and CAPE tools were applied at baseline and then 3 months after the usage of Memantine 20 mg per day.

Psychiatrist used ICD-10 criteria to diagnose Alzheimer's dementia while MMSE and CAPE were applied by the clinical psychologist. SPSS 16 version was used to make statistical analysis using paired sample t-test.

RESULTS

A total of 55 patients who presented to us with the symptoms of Dementia were enrolled in the study. There were 39 male and 16 females with the mean age of 62.35±10.51 years. Mean age of the male patients was 62.71±11.12 years and the mean age of the female patients was 61.09±8.43 years. Forty three (43) patients completed their follow up visit at 3 months interval which included 31 males and 12 females. Mean score of the patients who completed follow up on MMSE at baseline was 17.47±6.04, while mean dependency grade of CAPE at baseline was 3.67±1.44. Mean score on MMSE at follow up was 19.67±5.88 while mean dependency grade of CAPE was 2.67±1.39. Paired sample t-test was applied to compare the scores of the patients at baseline and at follow up and there was significant difference between scores with the p=0.00 (Table 1).

Table 1: Mean scores on MMSE and CAPE

	At base line	At follow up	p value
MMSE	17.49 + 6.04	19.67 + 5.88	.000
CAPE	3.67 + 1.44	2.67 + 1.39	.000

DISCUSSION

Most Patients included in this study had moderate dementia. Results of our study showed that patients had improvement in both cognitive function and dependency levels at the end of 3 months follow up leading to better quality of life. Meta analysis of studies by Winblad et al [13] showed efficacy of Memantine in cognition, function, global and behavior while we observed the patients in cognition and function only and observed significant improvement in both domains.

Some studies have reported a higher risk of AD in women than in men; other studies, however, including

the Aging, Demographics, and Memory Study, found no difference in risk between men and women[14]. Among AD patients overall, any sexual disparity could well be due to women's higher life expectancy. Among those who are heterozygous for the APOE E4 allele, however, Payami et al found a twofold increased risk in women[15]. Our study in contrast showed a higher number of males which could be due to religious, cultural and social variations as females are less likely to seek help especially regarding mental health problems. However more work needs to be undertaken in this regard to know the exact reason for this variation.

More than 90% of cases of AD are sporadic and occur in individuals older than 60 years. The World Health Organization's review by Mathers[16] in 2000 on the Global Burden of Dementia, an integrative analysis of 47 surveys across 17 countries, suggested that prevalence of dementia from any cause is less than 1% in people aged 60-69 years, increasing to about 39% in persons 90-95 years old. In our study mean age of onset for males was 62 while for females it was 61 which is much lower than the developed countries. This could well be a result of low life expectancy or due to early development of cognitive problems but needs more studies in this population to know exact cause.

Calabrese et al[17] found that Memantine 20 mg/day for 6 months increased the average MMSE value by 2.5 points, indicating a clear improvement in cognitive symptoms. In our study most patients had moderate dementia and their average MMSE improved by around 2 points at the end of 3 months with the administration of 20 mg/day which is quite significant. Also the dependency grade for CAPE assessment had significant improvement showing better quality of life in terms of physical and cognitive dependence. So effectiveness of Memantine on cognition and function in our study is comparable to international study but there is still place for more research in this particular area of geriatric psychiatry in our own settings.

CONCLUSION

We conclude from our study that Memantine has useful role in the improvement of the cognitive functions and behavioral dependency of the demented patients as there were significant improvements seen in both cognitive functions and level of dependency of the patients with Alzheimer dementia after 3 months follow up assessment.

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CONTRIBUTORS

MFK conceived the idea and wrote the manuscript of the study. FB, MMHA, NRA and NZ helped in the data analysis and write up of the manuscript. ZN supervised the study. All the authors contributed significantly to the research that resulted in the submitted manuscript.