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Severity of cognitive function affection using mini mental scale examination in geriatric population

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ABSTRACT

Background

The world population has been experiencing significant ageing process that results in rising proportions of older persons in the total population since the mid-twentieth century. Cognitive function is unavoidable part of the aging process. Aging and deteriorating cognition is likely due to age and it progresses to incident dementia beginning at approximately the age of 65.

Aim

The aim of the study was to know the severity of cognitive function affection using Mini mental state examination scale (MMSE) in geriatric population.

Method

A survey study was conducted in the community of Ahmedabad. Hundred volunteers aged 65 to 85 years were included. The subjects with cognitive deficits following head trauma, any neurological and visual problems were excluded. MMSE which included tests of orientation, attention, memory, language and visual-spatial skills was administered to the subjects.

Result

Percentage of cognitive function affection in geriatric population was as follows, 11.6 % (Severe cognitive impairment), 60% (Mild cognitive impairment), and 28.3% (No cognitive impairment).

Conclusion

There is mild cognitive function affection in geriatric population and very low severe affection. So cognition function is affected by ageing process.

Keywords: Geriatric, Cognitive function, Mini mental examination scale

INTRODUCTION

The geriatric population is defined as population aged 65 years and above. Ageing is a natural process. In the other words “old age is an incurable disease”, but more recently Sir James Sterling Ross commented, “you do not heal old age you protect it: you promote it; you extend it”. Old age is not a disease in itself, but the elderly are vulnerable to long term diseases of insidious onset such as cardio-vascular diseases, cancers, diabetes, musculoskeletal and mental illnesses. They have multiple symptoms due to decline in the functioning of various body functions [1].

The physiological decline in ageing refers to the physical changes an individual experiences because of the decline in the normal functioning of the body resulting in poor mobility, vision, hearing, inability to eat and digest food properly, a decline in memory, the inability to control certain physiological functions, and various chronic conditions [2]. Along with physical decline, decline in cognitive function is a hallmark of ageing and is predictive of mortality. Cognitive function refers to an individual's perceptions, memory, thinking, reasoning and awareness. Independence in later life is as much determined by cognitive ability as by physical ability [3]. Cognition is a term referring to the mental processes involved in gaining knowledge and comprehension, including thinking, knowing, remembering, judging and problem-solving [4].

Cognitive function is an unavoidable part of the aging process. Aging and deteriorating cognition is likely due to age and it progresses to incident dementia beginning at approximately the age of 65 years. Normal cognitive aging includes established declines in cognitive processes that affect every day functional abilities for older adults such as driving, banking, and medication administration. Cognition or intelligence includes abilities such as use of symbols and abstractions, acquiring new information, and adapting to changing situations. Intelligence, learning, and memory are three key cognitive domains that normally change during aging and have implications for maintaining independence and quality of life [3].

The world population has been experiencing significant ageing process that results in rising proportions of older persons in the total population since the mid-twentieth century. Martin JP et al in 2010 reported that mild cognitive impairment (MCI) is a syndrome that is thought to constitute a transition phase between healthy cognitive aging and dementia. It is characterized by impairment in cognitive domains that is intermediary between normal aging and dementia and associated with impairment in motor coordination and balance leading to an increased risk of falling with subsequent soft tissue injuries and fractures [5]. Few studies in India, have studied cognition in the geriatric population. So the present study aimed to know the severity of cognitive function affection in geriatric population by the use of mini mental state examination.

MATERIALS AND METHODS

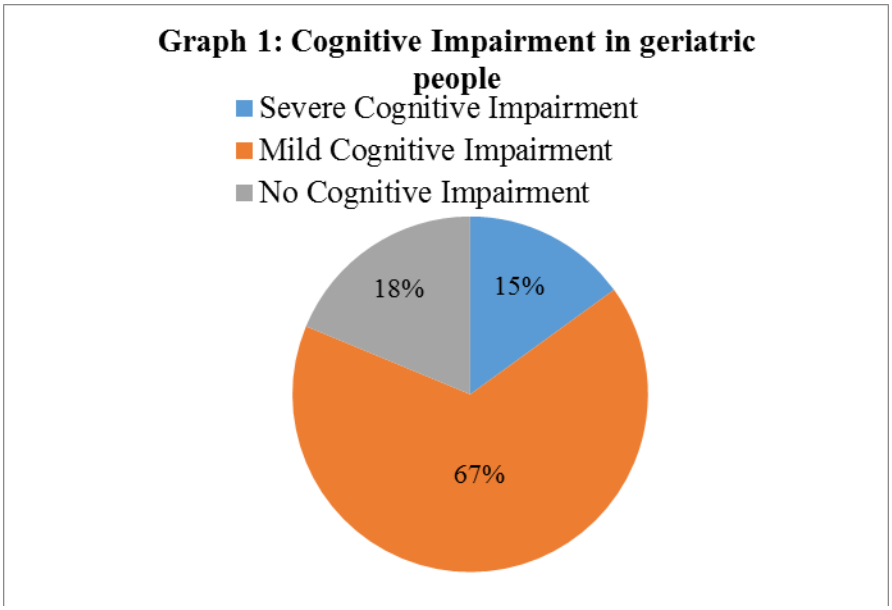
A cross sectional survey study was conducted in community of Ahmedabad. Hundred subjects both males and females, aged between 65 to 85 years who volunteered to participate were included in the study by convenience sampling. Subjects who had cognitive deficits following head trauma, any known neurological, visual problems and auditory problems with low literacy were excluded.

The nature and purpose of the study was explained to the subjects. Oral consent was taken from participants prior to study. Instructions regarding the Mini Mental State Examination scale was provided.

The Mini Mental State Examination (MMSE) is effective as a screening tool for cognitive impairment with older, community dwelling, hospitalized and institutionalized adults. It is a tool that can be used to systematically and thoroughly assess mental status. It is an 11-question measure that tests five areas of cognitive function: orientation, registration, attention and calculation, recall and language. The maximum score is 30 [5]. MMSE is a widely used test of cognitive function among the elderly [6]. It includes tests of orientation, attention, memory, language and visual-spatial skills. The questions were asked in the order listed. One point was scored for each correct response within each question or activity. The questions were asked in the order listed. One point was scored for each correct response within each question or activity. Then final score was counted out of 30 [6]. Severity of cognition affection was decided according to score of severity of cognition which is as follows: 0-17 (Severe cognitive impairment), 18-23 (Mild cognitive impairment), 24-30 (No cognitive impairment). The MMSE takes only 5-10 minutes to administer and is therefore practical to use repeatedly and routinely. Level of significance was kept at 5%.

RESULTS

100 subjects completed the test in which there were 40 females and 60 males. Mean age of participants was 74.76 ± 7.43 years. The results of this study showed that there was mild cognitive impairment in the geriatric population according to score of severity of cognition affection as shown in graph 1.



DISCUSSION

The present study showed that there was mild cognitive affection in 67% of the geriatric people. The findings of this study are similar to the studies of Carina H [8], Shaikh S [4], Graham E [9] and Rosenberg I [10].

Causes that affect cognitive function in geriatric population are oxidative stress and free radical damage, chronic low-level inflammation, hypertension, heart failure, declining hormone levels like estrogen and testosterone, inner arterial lining (endothelium) dysfunction, insulin resistance, excess body weight, suboptimal nutrition, loneliness, lack of social network, and high stress [3].

Theoretically, age-related cognitive changes normally occur as outcomes of distal or proximal life events. Distal events are early life experiences such as physical, cultural, and social conditions that influence cognitive development and functioning. Fillit et al in 2002 concluded that cognitive abilities are important to maintain performance. Proximal (recent) factors also contribute to reduced cognitive performance in aging. Multiple serial cognitive processes including processing speed, size of working memory, inhibition of extraneous environmental stimuli, and sensory losses contribute to cognitive decline. Cognitive capacity remains intact with aging, but encoding, storage, and retrieval become less efficient or are interrupted by reduced attention and working memory capacity. Slowed processing speed can interfere with problem solving by extending the time required for an older adult to perceive, interpret, select, and execute responses [7].

Carina H et al in 2014 concluded that subjects suffering from heart failure have a decreased performance in spatial and episodic memory and they also have a higher risk for developing dementia. Cognitive dysfunction as well as higher prevalence of dementia can contribute to decreased adherence to prescribed therapy and self-care management, and lead to other socio-behavioral problems [8].

Shaikh S et al in 2014 reported that early onset hypertensives showed mild cognitive impairment Cognitive rehabilitation was found to be effective for improving the cognitive functions among elderly. They also suggested that midlife high BP is a risk factor for late-life cognitive impairment and dementia. This author also quoted that hypertension is not only the risk factor for the vascular dementia, but also leads to the degenerative changes in the brain causing cognitive changes [4]. However blood pressure or heart failures were not assessed in the present study.

Graham E reported that the prevalence of all types of cognitive impairment, including dementias, increased with age and (CIND) cognitive impairment no dementia is commonly associated with functional disability and a need for institutional care [9].

Rosenberg I reported that some of decline in cognitive function associated with aging is preventable or reversible with improved vitamin

nutritive, especially vitamin B-12, vitamin B-6, folate and the quality of life of aging individual depends on their capacity of physical mobility, mental alertness and cognitive function .Progressive age-associated decline in memory, name-finding, complex decision-making and speed of information processing is common throughout late middle-age and later life, and may lead to social withdrawal and depression [10].

A limitation of this study was that **t**he instrument relies on verbal response and reading and writing. Therefore, patients that are hearing and visually impaired, intubated, have low English literacy, or those with other communication disorders may perform poorly even when cognitively intact.

After knowing about the impairment, one can apply exercises that improve cognitive function like teaching behavioural strategies, problem-solving skills, self-monitoring and provision of feedback. Also encouraging walking and associated effects of cognitive interventions can be to improve mood and to reduce depression. Complex behaviors can be broken into small steps, and, as each step is mastered, the next one is added. Exercises may also help geriatric people during physical activities in community in day to day life. Home exercise programme can improve social activity and quality of life of geriatric people [11].

CONCLUSION

There is mild cognitive function affection in 67% and severe affection in 15% of the geriatric population in Ahmedabad.

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