

AN OVERVIEW ON GERIATRIC NEUROCOGNITIVE DISORDERS

Author's Name: Anthadupula Shruthi¹, Syeda Nishat Fathima²

Affiliation:

1. Department of Pharmacology, Jayamukhi College of Pharmacy, Narsampet, Warangal-506332, Telangana, India.
2. Department of Pharmacology, Jayamukhi College of Pharmacy, Narsampet, Warangal-506332, Telangana, India.

Corresponding Author Name & E-Mail: Anthadupula Shruthi,
shruthianthadupulaa@gmail.com

ABSTRACT

The normal aging process is associated with declines in certain cognitive abilities, such as processing speed and certain memory, language, visuospatial, and executive function abilities. While these declines are not yet well understood, promising developments in neurology research have identified declines in grey and white matter volume, changes in white matter, and declines in neurotransmitter levels that all may contribute to observed cognitive changes with aging. Different neurocognitive disorders commonly encounter in geriatric patients include Alzheimer's disease, Vascular dementia, Lewy bodies dementia, Frontotemporal disorders and Mild cognitive impairment. It's essential to note that early diagnosis, proper evaluation, and individualized care plans are critical for managing neurocognitive disorders in geriatric patients. Treatment and support strategies may include medications, cognitive rehabilitation, occupational therapy, and caregiver education and assistance. Additionally, lifestyle modifications and addressing underlying medical conditions can play a role in managing these disorders in older adults.

Keywords: Alzheimer's disease; Frontotemporal disorders; Mild cognitive impairment

INTRODUCTION

Cognitive functioning is a major health concern that affects an individual's ability to live independently and is a key determinant of quality of life. Among older adults, cognitive function varies widely with aging. Generally, some cognitive functions are relatively stable with aging, including vocabulary and knowledge of world events, whereas other cognitive functions, particularly those that rely on mental processing speed and attention, working memory, executive function, and verbal recall, decline with age. These decrements in cognitive functioning with aging have been related to changes in underlying neuroanatomic structures, such as decreases in white matter integrity and decreased volumes of the caudate, cerebellum, hippocampus, prefrontal cortex, and medial temporal lobes. Conversely, improved cognitive functioning with aging has been correlated with intact neuroanatomic structures, most notably in the hippocampus and the frontal lobes. [1]

Neurocognitive disorders, also known as neurocognitive disorders, are a category of mental health disorders that primarily affect cognitive abilities including learning, memory, perception, and problem-solving. Neurocognitive disorders include delirium, mild neurocognitive disorders, and major neurocognitive disorder. They are defined by deficits in cognitive ability that are acquired (as opposed to developmental), typically represent decline, and may have an underlying brain pathology. The DSM-5 defines six key domains of cognitive function: executive function, learning and memory, perceptual-motor function, language, complex attention, and social cognition. Any displacement in these six domains results in neurocognitive impairment. This paper highlights the neurocognitive disorders usually encountered in elderly. [2]

ALZHEIMER'S DISEASE:

Alzheimer's disease represents the most common form of dementia in elderly individuals, affecting nearly 10% of the population after 65 years of age. Clinical and neuropathological studies suggest that cases with Alzheimer's disease alone or in combination with other diseases represent more than 50% of all demented patients over the age of 65 years. From a neuropathological point of view, neurofibrillary tangles, senile plaques, and neuronal and synaptic loss are the major pathologic features associated with Alzheimer's disease. It is now well established that these alterations are also present in normal brain aging, but they are far less severe than in Alzheimer's disease, and occur in restricted regions of the cerebral cortex. Alzheimer's disease dementia is a progressive neurodegenerative disease affects the part of the

brain called the cerebral cortex (language and reasoning) which controls thought, memory, and language and is caused by a loss of nerve cells in areas of the brain central to memory. Disease symptomatology includes impaired cognition (e.g., memory difficulties) and is thus associated with difficulty in performing daily activities and consequent functional dependence on others for help. [3]

VASCULAR NEUROCOGNITIVE DISORDER (VASCULAR DEMENTIA):

Vascular dementia is dementia caused by problems in the blood supply to the brain, resulting from a cerebrovascular disease. Restricted blood supply (ischemia) leads to cell and tissue death in the affected region, known as an infarct. Cerebrovascular lesions, mainly lacunes and white matter ischemia, are common in elderly patients with dementia. Vascular dementia is the second most common cause of dementia, after Alzheimer's disease. However, lacunar strokes have become an important factor in the clinical expression of Alzheimer's disease. Also, population-based studies indicate that vascular risk factors increase the risk of developing Alzheimer's disease. It is postulated here that the two main causes of Vascular dementia — stroke and ischemic heart disease—may be responsible for the majority of cases of dementia in the elderly. The three types of vascular dementia are subcortical vascular dementia, multi-infarct dementia, and stroke related dementia. Subcortical vascular dementia is brought about by damage to the small blood vessels in the brain. Multi-infarct dementia is brought about by a series of mini-strokes where many regions have been affected. The third type is stroke related where more serious damage may result. Such damage leads to varying levels of cognitive decline. When caused by mini-strokes, the decline in cognition is gradual. When due to a stroke, the cognitive decline can be traced back to the event [4]

DEMENTIA WITH LEWY BODIES:

Dementia with Lewy bodies is a type of dementia characterized by changes in sleep, behaviour, cognition, movement, and regulation of automatic bodily functions. Memory loss is not always an early symptom. The disease worsens over time and is usually diagnosed when cognitive impairment interferes with normal daily functioning. REM sleep behaviour disorder in which people lose the muscle paralysis (atonia) that normally occurs during REM sleep and act out their dreams is a core feature. REM sleep behaviour disorder may appear years or decades before other symptoms. Other core features are visual hallucinations, marked fluctuations in attention or alertness, and parkinsonism (slowness of movement, trouble walking, or rigidity). A presumptive diagnosis can be made if several disease features or biomarkers are present; the

diagnostic workup may include blood tests, neuropsychological tests, imaging, and sleep studies. A definitive diagnosis usually requires an autopsy. Most people with Dementia with Lewy bodies do not have affected family members, although occasionally DLB runs in a family. The exact cause is unknown but involves formation of abnormal clumps of protein in neurons throughout the brain. Manifesting as Lewy bodies and Lewy neurites, these clumps affect both the central and the autonomic nervous systems. Heart function and every level of gastrointestinal function—from chewing to defecation—can be affected, constipation being one of the most common symptoms. Low blood pressure upon standing can also occur. Dementia with Lewy bodies commonly causes psychiatric symptoms, such as altered behavior, depression, or apathy. Dementia with Lewy bodies typically begins after the age of fifty, and people with the disease have an average life expectancy, with wide variability, of about four years after diagnosis. There is no cure or medication to stop the disease from progressing, and people in the latter stages of Dementia with Lewy bodies may be unable to care for themselves. Treatments aim to relieve some of the symptoms and reduce the burden on caregivers. Medicines such as donepezil and rivastigmine can temporarily improve cognition and overall functioning, and melatonin can be used for sleep-related symptoms. Antipsychotics are usually avoided, even for hallucinations, because severe reactions occur in almost half of people with Dementia with Lewy bodies, and their use can result in death. Management of the many different symptoms is challenging, as it involves multiple specialties and education of caregivers. [5]

FRONTOTEMPORAL DEMENTIA:

Frontotemporal disorders, sometimes called frontotemporal dementia, are the result of damage to neurons in the frontal and temporal lobes of the brain. Many possible symptoms can result, including unusual behaviors, emotional problems, trouble communicating, difficulty with work, or difficulty with walking. Frontotemporal dementia is rare and roughly 60% of people with frontotemporal dementia are 45 to 64 years old. Frontotemporal lobar degeneration in elderly patients does exist as a separate entity from presenile-onset Frontotemporal dementia. Its main features include clinically frequent memory loss and behavioural change predominating over language and semantic dysfunction and neuropathologically prominent hippocampal sclerosis but less pronounced cortical lobar atrophy. Frontotemporal dementia is a heterogeneous disorder with several clinical variants, each associated with distinct symptom profiles. Behavioural Variant frontotemporal dementia is characterized by changes in behaviour, personality, and social conduct. Individuals may exhibit impulsivity, disinhibition,

apathy, and poor judgment. Emotional blunting and lack of empathy are also common. Primary Progressive Aphasia affects language abilities and can manifest in different ways such as In Semantic Variant individuals have difficulty understanding and using words, leading to word-finding difficulties and the inability to recognize familiar faces or objects, Non-fluent Variant is marked by reduced fluency, grammar difficulties, and hesitant speech and people with this variant have trouble with word retrieval and sentence repetition in Logopenic Variant. [6]

MILD COGNITIVE IMPAIRMENT:

Mild cognitive impairment is a neurocognitive disorder which involves cognitive impairments beyond those expected based on an individual's age and education but which are not significant enough to interfere with instrumental activities of daily living. MCI may occur as a transitional stage between normal aging and dementia, especially Alzheimer's disease. It includes both memory and non-memory impairments. The cause of the disorder remains unclear, as well as both its prevention and treatment, with some 50 percent of people diagnosed with it going on to develop Alzheimer's disease within five years. The diagnosis can also serve as an early indicator for other types of dementia, although MCI may remain stable or even remit. [7]

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