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Review Article

Speech and language impairments in dementia

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ABSTRACT

The current demographic trend is dramatically changing; particularly the number of older people is rising. This trend of older population causes an increase of aging diseases such as dementia. At present the most frequent type of dementia is Alzheimer's disease, the second most frequent type is vascular dementia, and the third one is dementia with Lewy bodies. These are then followed by Parkinson's disease dementia, frontotemporal dementia/degeneration, and mixed dementia. The purpose of this review study is to explore speech and language disorders of each of the above mentioned dementias and examine their similarities and differences. Furthermore, the authors want to discuss the underlying factors influencing language deterioration in dementia, suggest a few techniques which can assist patients with dementia in communication and emphasize the role of preventive, non-invasive strategies/therapies in this process.

The authors used a method of literature review of available sources dealing with different types of dementia and their common symptoms. Furthermore, a method of comparison of different research studies exploring speech and language impairments of the main types of dementia mentioned above and their comparison was applied.

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Introduction

Current demographic trends are changing dramatically; particularly the number of older people is rising. It is assumed that the world's population of elderly people will reach 1.5 billion in 2050 compared to the present 600 million (Prince et al., 2013). This trend of an increasingly older population will cause an increase in diseases associated with aging such as dementia (Berger, 2011). As Langa (2015) states, today there are about 44.3 million people suffering from dementia and by 2050

this number is forecasted to triple due to increasing life expectancies and the aging population worldwide.

As Pohanka (2011) states, dementia is one of the main causes of incapability and dependency of elderly people. It is a disease which particularly affects the brain and damages neuronal synapses. This damage impedes communication between brain cells and this consequently results in worsening of cognitive, behavioral, motor control, and other functions. Neurodegenerative disease is in fact behind most dementias. The most common symptoms of dementia are as follows: a considerable loss of memory, orientation problems, impaired

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communication skills, depression, behavioral changes and confusion. There are different reasons which cause these symptoms of dementia. Those are, for example, an impediment of blood flow which circulates into the brain, multiple small strokes, malnutrition, brain tumors, metabolic diseases or trauma (Nieoullon, 2011).

Dementia is not one specific disease but it is a clinical syndrome, connected with a loss of memory and reasoning difficulties. It usually indicates problems with at least two brain functions. McKhann et al. (2011) set the key criteria for diagnosing dementia. They say that dementia can be diagnosed if there are cognitive and behavioral symptoms which should include at least two of the following aspects:

- worsened ability to gain and recall a new source of information (e.g., disorientation in well-known places, forgetting appointments or asking the same questions several times);
- worsened reasoning and judgment (e.g., low decision-making processes, tendency to safety risks or inability to conduct complex tasks);
- worsened visuospatial skills (e.g., failure to recognize famous faces or things, inability to dress appropriately or to find things);
- worsened language (e.g., difficulties finding the right words, name the objects correctly, making hesitations or writing mistakes); and
- behavioral changes (e.g., frequent changes in mood, social exclusion or apathy).

Thus, the clinical syndrome of dementia covers a wide range of underlying diseases. In general the most common associations are between the clinical syndrome and the area of cerebral cortex or subcortical structures involved (Rossor, 2001). As Perl and Pendlebury (1986) present, the most common neuropathology in dementia is characterized by the widespread development of neurofibrillary tangles and senile or neuritic plaques in the hippocampus and neocortex which is especially typical of Alzheimer's disease, which is the most frequent type of dementia nowadays and encompasses 70% of all dementia cases. The second most frequent type is vascular dementia (17% of all dementia cases), and the third one is dementia with Lewy bodies (10–25% of all dementia cases). These are then followed by Parkinson's disease dementia (PDD), frontotemporal dementia/degeneration (FTD), and mixed dementia (Alzheimer's Association, 2015). Table 1 summarizes the main types of dementias and their proteinopathies.

The purpose of this mini review is to explore speech and language disorders of each of the above mentioned dementias and examine their similarities and differences. Furthermore, the authors want to discuss the underlying factors influencing language deterioration in dementia, suggest a few techniques which can assist patients with dementia in communication and emphasize the role of preventive, non-invasive strategies/therapies in this process.

Materials and methods

The authors reviewed the available literature dealing with different types of dementia and their common symptoms.

Table 1 – Main types of dementia and their proteinopathies.

Disease	Protein	Location and form of deposits
AD	Beta amyloid	Extracellular-amyloid
AD, FTD	Tau	Neurofibrillary tangle and other neuronal and glial inclusions
FTD, ALS	TDT-43	Neuronal and glial inclusions
PD, LBD	Alpha-synuclein	Neuronal inclusions-Lewy bodies
HD	Polyglutamine-expanded (polyQ) proteins	Intranuclear and cytoplasmic

Source: authors' own processing.

AD, Alzheimer's disease; ALS, amyotrophic lateral sclerosis; LBD, Lewy body disease; FTD, frontotemporal lobar degeneration; HD, Huntington's disease; PD, Parkinson's disease.

Furthermore, a method of comparison of different research studies exploring speech and language impairments of the main types of dementia mentioned above and their comparison was applied.

Research studies were selected on the basis research topics (i.e., dementia and language impairments; dementia and language disorders; dementia and speech impairments; and dementia and speech disorders) found in research studies in peer-review articles from the Web of Science, ProQuest, Elsevier Science Direct, Springer and Scopus from the period of 1990 up to the present time. These research studies were classified according to their relevancy. Most of these articles focused on AD and language disorders, fewer then on primary progressive aphasia. However, the goal of this paper is to research speech and language impairments in other types of dementia as well. The authors also searched the databases of the well-established organizations such as Alzheimer's Association and encyclopedias such as *The Gale Encyclopedia of Mental Disorders* for relevant information.

Individual types of dementia and their speech and language impairments

Speech and language impairments cause people with dementia serious difficulties in communicating. Speech disorders can be characterized by difficulty in articulating words. Language disorders can be understood as an impaired language system, involving word finding, word retrieval or anomia, i.e., the processing of linguistic information.

It is the left hemisphere of the brain which is particularly connected with the speech and language functions. There are two specific areas of the brain whose damage causes the speech and language impairments. Those are the Broca's area in the posterior frontal lobe and the Wernicke's area in the temporal lobe. Harm to Broca's area causes difficulties with fluency, while harm to Wernicke's area affects speech which is fluent, however, it lacks content (Longe, 2011).

The most common speech impairments connected with dementia include apraxia of speech and dysarthria. Apraxia of speech, also known as acquired apraxia of speech, verbal apraxia and dyspraxia is a motor speech disorder. People with

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