

CPSYC 2016: 4th International Congress on Clinical and Counselling Psychology

## Cognitive Decline in Dementia with Special Focus on Language Impairments

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### Abstract

<http://dx.doi.org/10.15405/epsbs.2016.05.02.9>

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. The purpose of this article is to discuss language disorders of the main types of dementia and explore their similarities and differences. In addition, the author emphasizes the role of the non-pharmacological therapies. The methods used for this review comprise a method of literature review of available sources dealing with the main types of dementia, and a method of comparison of different research studies exploring language disorders of the main types of dementia mentioned above and their comparison.

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**Keywords:** Dementia; cognitive decline; language disorders.

### 1. Introduction

At present people live longer and the number of elderly population is rapidly rising. It is estimated that the world's population of the elderly people will reach 1.5 billion in 2050 compared to present 600 million (Prince et al., 2013). This trend of elderly population results in the growth of aging diseases such as dementia (Berger, 2011). Currently, there are about 44 million people suffering from dementia and by 2050 their number should reach 135 million (Langa, 2015). Dementia mostly occurs in the second half of life, often after the age of 65 (Alzheimer's Association, 2015).

Dementia is a term used to describe various symptoms of cognitive decline that interferes with normal life functions. It is caused by physical changes in the brain. The most common symptoms are



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memory loss, language and communication problems, general confusion (disorientation in time and / or place), lapses in judgment, misplacing objects, difficulty performing familiar activity, behaviour and personality changes, sudden mood swings or apathy (McKhann et al., 2011).

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). At present the most frequent type of dementia is Alzheimer's disease (AD) which covers 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).

## **2. Methods**

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 language impairments of the main types of dementia mentioned above and their comparison was applied.

The selection criterion of the research studies was based on the research topics (ie, *dementia and language impairments; and dementia and language disorders*) found in the research studies in the peer-review articles from the PubMed, Web of Science, Springer, and Scopus, in 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 than on primary progressive aphasia. However, the goal of this article is to explore cognitive decline with special focus on language disorders in the main types of dementia. 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.

## **3. Language disorders and dementias**

Language disorders can be understood as an impaired language system, involving word finding, word retrieval or anomia. It is the left hemisphere of the brain which is particularly connected with the language functions. There are two specific areas of the brain whose damage causes language impairments. Those are Broca's area in the posterior frontal lobe and Wernicke's area in the temporal lobe. Harm to Broca's area causes difficulties with language fluency, while harm to Wernicke's area affects the speech which is fluent, however, it lacks the content (Longe, 2011).

Language impairments usually cause an irrelevant use of words and their meaning; inability to convey ideas, an inappropriate use of grammatical word forms, a lack of vocabulary, non-fluent speech, or talking too quickly or too slowly (Krapp, 2012). Depending on the type of dementia, these language impairments are either similar or completely different. The authors of this study discuss these

language disorders with respect to the frequency occurrence of a given dementia, and particularly in the early stage of this aging disease.

Table 1 below provides an outline of the key language impairments in the main types of dementia.

**Table 1.** The key language impairments in the main types of dementia.

Type of dementia	The key language impairments in the early stages of dementia
<i>Alzheimer's disease</i>	finding the right word for objects naming the objects word comprehension loud voice
<i>Vascular dementia</i>	finding the right word for objects naming the objects word comprehension incomprehensible speech decreased complexity
<i>Dementia with Lewy Bodies</i>	language disorders include both the symptoms of AD and PDD
<i>Parkinson's disease dementia</i>	non-articulated speech loss of verbal fluency non-grammatical sentences slow speech soft voice
<i>Frontotemporal dementia</i>	slow and hesitant speech grammatical mistakes
<i>Progressive non-fluent aphasia</i>	worsened understanding of complex sentences finding the right word for objects loss of literacy skills such as reading and writing
<i>Semantic dementia</i>	finding the right word for objects naming the objects word comprehension a lack of vocabulary surface loss of literacy skills
<i>Mixed dementia</i>	language disorders include the symptoms of AD, vascular dementia and DLB, or just a combination of two of them

Source: authors' own processing

#### **4. Discussion**

Table 1 above demonstrates that certain types of dementia share similar language disorders such as AD, vascular dementia, progressive non-fluent aphasia, or mixed dementia. For example, Vuorinen et al. (2000) claim that language disorders in the early phases of vascular dementia are similar to those in Alzheimer's disease, particularly as far as the semantic aspects are concerned. The core factor is the age (Liu, 2015). Some research studies (Amieve et al., 2005; Laws et al., 2010) also prove that patients with higher education have higher language deterioration than patients with lower education. In other research studies (Stern et al., 1999) the findings show the very opposite. However, there are persuasive conclusions from clinical research studies (Zanini et al., 2010) that language skills are to some degree associated with cognitive abilities, which is also reflected in patient's difficulties in communication since communication, both digital and analogue (Watzlawick et al., 2011) provides an ability to establish and maintain a relationship and strives for understanding. It can hierarchize information according to its importance, it produces and receives meaning, it has a phatic function, as well as many other functions. Communication is one of the basic relationships of man towards the world. By neglecting communication, thinking is being deformed. Therefore intervention therapies are required.

Furthermore, neuropsychiatric symptoms such as depression or apathy can also influence communication performance (Starkstein et al., 1989). All this has a negative impact on the overall patient's their caregivers' state of health (Klimova, Maresova, Valis, Hort, & Kuca, 2015). Thus, earlier diagnosis of cognitive degeneration, including language disorders, with the accurate assessment tools (Cabral Soares et al., 2015) may help not only to assign the right medication treatment but also the management of the particular type of dementia. In addition, besides the pharmacological treatment, which is usually costly and has negative side effects, there are alternative therapies such as physical activities, cognitive training, or healthy diets (Klimova & Kuca, 2015).

#### **5. Conclusion**

The authors of this article have indicated the key language disorders with respect to the main types of dementia. The results show that some language disorders overlap in certain types of dementia which is given not only by the cause of a particular dementia, but also by other underlying factors. There is a number of research studies on language disorders in AD and FTD, however, there are not many randomized clinical research studies on language disorders in vascular dementia, DLB or PDD. In addition, researchers should pay equal attention to all four language skills, not only to speaking.

#### **Acknowledgements**

The paper is supported by the project Excellence (2016) at the Faculty of Informatics and Management of the University of Hradec Kralove, Czech Republic.

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