DIAGNOSIS AND TREATMENT METHODS OF ALZHEIMER'S DISEASE

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Annotation

Alzheimer's disease is a neurodegenerative brain disorder that mainly occurs in elderly individuals. This disease leads to a decline in cognitive and memory abilities, as well as changes in mental and emotional state. The diagnosis and treatment of Alzheimer's disease remain one of the most pressing issues in modern medicine. In the early stages of the disease, memory and thinking abilities decline, causing difficulties in the patient's daily life. This article discusses the diagnosis, treatment methods, and preventive recommendations for Alzheimer's disease.

Keywords

Alzheimer's disease, diagnosis, treatment methods, memory, cognitive disorder, neurological disease, psychological tests, cholinesterase inhibitors, memantine, cognitive therapy, physiotherapy, speech therapy, lifestyle, stress reduction, achieved advances, neurotransmitters, magnetic resonance imaging, computed tomography, psychotherapy, cognitive rehabilitation.

Alzheimer's disease was first described in 1906 by the German physician Alois Alzheimer. Today, millions of people worldwide suffer from this disease. Alzheimer's disease deteriorates brain function and gradually leads to the loss of memory and thinking abilities. This disease is not limited only to geriatrics and may also occur among younger populations. Although numerous scientific studies have been conducted on the causes, symptoms, and progression of the disease, a complete and effective cure has not yet been found. The development of Alzheimer's disease may be associated with a decrease in neurotransmitters, the accumulation of beta-amyloid plaques, and changes related to tau proteins in the brain. Ongoing research into new medications and treatment methods aimed at preventing and slowing disease progression has yielded promising results. This article provides detailed information on the diagnosis, diagnostic methods, treatment approaches, preventive recommendations, and modern scientific research related to Alzheimer's disease. Early detection and appropriate treatment play an important role in improving patients' quality of life.

Alzheimer's disease damages several important regions of the brain. The disease primarily causes changes in the following areas. The hippocampus is one of the central brain structures associated with memory and the storage of new information. In the early stages of Alzheimer's disease, damage occurs primarily in the hippocampus, leading to memory loss and difficulty remembering new information. The parahippocampal gyrus is another brain region closely connected to the hippocampus. Damage to this area also disrupts memory and cognitive functions. The prefrontal cortex is associated with decision-making, problem-solving, and attention control. As Alzheimer's disease progresses, changes occur in the prefrontal cortex, resulting in impaired attention and creative thinking abilities. Temporoparietal junctions are related to language use, visuospatial cognition, and spatial orientation. In Alzheimer's disease, degeneration begins in these regions as well, leading to language and spatial difficulties. The occipital cortex is relatively less affected in the early stages of Alzheimer's disease, but as the disease progresses, visual and visual memory problems may arise. Overall, Alzheimer's disease primarily damages brain regions responsible for memory and cognitive functions. As the disease

progresses, these damages deepen and lead to neuronal death.

Alzheimer's disease is a neurological disorder that primarily affects older adults (over 60 years of age) and results in difficulties with memory, thinking, speech, and the management of daily activities due to brain cell damage. The exact causes of this disease are not fully understood; however, genetic, environmental, and chemical factors may contribute to its development.

Effective diagnostic evaluation and analysis are critically important in identifying Alzheimer's disease. Early detection of initial symptoms facilitates treatment and improves the patient's quality of life. Several diagnostic methods are used to diagnose Alzheimer's disease, each of which is described in detail below.

Clinical Assessment

Clinical assessment is the primary method for diagnosing Alzheimer's disease and involves a detailed evaluation of the patient's general condition and symptoms. The physician analyzes changes in memory, thinking, and daily functioning. The following aspects are considered during clinical assessment.

Changes in memory and speech:

The earliest signs of Alzheimer's disease are often related to memory problems. Patients experience difficulty remembering new information and may even forget familiar people. Speech changes may also be observed, such as difficulty finding words or completing sentences.

Decline in cognitive activity:

Alzheimer's disease affects various cognitive domains, including attention, decision-making, problem-solving, and planning. As the disease progresses, patients may have difficulty performing daily tasks such as cooking or managing finances.

Other symptoms:

As the disease advances, mood changes, depression, anxiety, and agitation may occur. In later stages, patients often experience sleep disturbances and emotional instability.

During clinical assessment, detailed information is collected regarding the patient's family history, existing health conditions, and observed changes. Based on this information, an initial diagnosis of Alzheimer's disease or other neurological disorders is made. Family members and close acquaintances may also participate in the assessment, as they often notice changes in the patient's memory and cognitive state earlier. Such interviews are especially useful in identifying patients in the early stages of the disease. Psychological evaluation is also conducted, as patients in early stages may deny their problems, making observations from relatives particularly important. Clinical assessment is used in combination with other diagnostic methods to differentiate Alzheimer's disease from other neurological conditions and to initiate appropriate treatment.

Neurological Examination

Neurological examination is an important diagnostic tool in identifying Alzheimer's disease. This method focuses on assessing brain function, nervous system status, and reflexes. The neurological examination includes the following components.

Assessment of brain function:

The physician evaluates memory, learning ability, attention, and executive functions. Alzheimer's disease primarily impairs memory and learning processes, so these areas receive special attention.

Reflex testing:

Reflexes indicate proper nervous system functioning. Eye, hand, and foot reflexes are examined to detect potential changes in motor or neurological function.

Coordination and movement assessment:

Patients with Alzheimer's disease may experience difficulties in controlling movements and maintaining coordination. Gait and posture are evaluated to determine changes in motor skills.

Speech and language assessment:

Speech and language decline is also observed in Alzheimer's disease. Patients may struggle to

recall words or speak fluently and coherently.

Neurological examination plays a crucial role in identifying brain and nervous system changes and is often used alongside other diagnostic methods such as psychological testing and imaging techniques.

Imaging Studies

Imaging studies such as computed tomography (CT) and magnetic resonance imaging (MRI) are essential tools for diagnosing Alzheimer's disease and monitoring brain changes.

Computed Tomography (CT):

CT provides layered images of the brain and helps identify structural changes and compression. In Alzheimer's disease, certain brain regions, particularly the hippocampus, show shrinkage.

Magnetic Resonance Imaging (MRI):

MRI offers high-resolution images of brain structures and allows detailed visualization of internal changes, including hippocampal atrophy and cortical thinning. MRI is effective in identifying general brain atrophy, especially in regions responsible for cognitive functions.

Alzheimer's-specific changes:

Imaging can reveal neuronal loss, cortical atrophy, and degeneration of cognitive regions. These changes may be detected even in early stages, making imaging crucial for early diagnosis and treatment planning.

Laboratory Tests

Laboratory tests assist in differentiating Alzheimer's disease from other neurological conditions. These tests primarily involve blood analyses.

Blood tests:

General health status is assessed, and conditions such as thyroid dysfunction (e.g., hypothyroidism), vitamin deficiencies (B12, folate), and blood glucose abnormalities are evaluated, as they may contribute to cognitive decline.

Other laboratory investigations:

Tests may be conducted to exclude infections such as encephalitis or meningitis, as well as autoimmune diseases like lupus or multiple sclerosis.

Laboratory tests help confirm diagnosis and rule out other potential causes of cognitive impairment.

Treatment Methods

Although Alzheimer's disease cannot currently be cured, several medications help alleviate symptoms and slow disease progression by improving neurotransmitter function and supporting cognitive abilities.

Cholinesterase inhibitors are among the most commonly used medications. They increase acetylcholine levels in the brain, improving memory and cognitive processes.

Donepezil: Widely used and effective in early stages.

Rivastigmine: Supports neurotransmission in mild to moderate stages.

Galantamine: Enhances cognitive function and memory.

These medications alleviate symptoms but do not cure the disease. Medical supervision is essential due to potential side effects.

Conclusion

Alzheimer's disease is a chronic, progressive neurodegenerative disorder primarily associated with aging, significantly affecting memory, thinking, and daily activities. It mainly damages the hippocampus, prefrontal cortex, and other cognitive brain regions. Although a complete cure is not available, early diagnosis and modern treatment approaches can significantly slow disease progression and improve quality of life. Diagnostic methods include clinical assessment, neurological and imaging examinations, and laboratory tests. Treatment relies on cholinesterase inhibitors, memantine, cognitive therapy, and healthy lifestyle practices. Ongoing scientific

research offers hope for more effective treatments in the future. Raising public awareness, early detection, and preventive measures remain critical tasks for global healthcare systems.

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