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Brain Atrophy in Alzheimer's Patients

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Abstract : Dementia comes in different forms, including Alzheimer's disease. The most common dementia diagnosis among elderly individuals is Alzheimer's disease. On average, for patients with Alzheimer's, life expectancy is around 4-8 years after the diagnosis; however, expectancy can go as high as twenty years or more, depending on the shrinkage of the brain. Normally, along with aging, the brain shrinks at some level but doesn't lose a vast amount of neurons. However, Alzheimer's patients' neurons are destroyed rapidly; hence problems with loss of memory, communication, and other metabolic activities begin. The toxic changes in the brain affect the stability of the neurons. Beta-amyloid and tau are two proteins that are believed to play a role in the development of Alzheimer's disease through their toxic changes. Beta-amyloid is a protein that is produced in the brain and is normally broken down and removed from the body. However, in people with Alzheimer's disease, the production of beta-amyloid increases, and it begins to accumulate in the brain. These plaques are thought to disrupt communication between nerve cells and may contribute to the death of brain cells. Tau is a protein that helps to stabilize microtubules, which are essential for the transportation of nutrients and other substances within brain cells. In people with Alzheimer's disease, tau becomes abnormal and begins to accumulate inside brain cells, forming neurofibrillary tangles. These tangles disrupt the normal functioning of brain cells and may contribute to their death, forming amyloid plaques which are deposits of a protein called amyloid-beta that build up between nerve cells in the brain. The accumulation of amyloid plaques and neurofibrillary tangles in the brain is thought to contribute to the shrinkage of brain tissue. As the brain shrinks, the size of the brain may decrease, leading to a reduction in brain volume. Brain atrophy in Alzheimer's disease is often accompanied by changes in the structure and function of brain cells and the connections between them, leading to a decline in brain function. These toxic changes that accumulate can cause symptoms such as memory loss, difficulty with thinking and problem-solving, and changes in behavior and personality.

Keywords : Alzheimer, amyloid-beta, brain atrophy, neuron, shrinkage
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