

<https://youtu.be/xtBxVggYsal>



Website:

www.Doctorharold.com

Alzheimer's disease

Manuscript

Alzheimer's disease is a degenerative disease of the brain described as early as 1906 by Dr. Alois Alzheimer.

There is progressive memory loss and loss of cognitive function.

Now what does cognitive function means?

Cognitive function.is an intellectual process by which one becomes aware of, perceives, or comprehends ideas.

It includes multiple mental abilities, learning, thinking, reasoning, remembering, problem solving, decision making and attention.

Alzheimer's disease is the most common form of dementia.

Dementia is a general term for declining mental ability which affects the performance of daily activities and routine.

Dementia became the leading cause of death in 2016 for Australian women, surpassing heart disease.

It is the third cause of death for men.

In 2019, there is an estimated 4 hundred thousand Australians living with dementia.

Alzheimer's disease is more specific and is the most common type of dementia accounting for 80% of cases.

Short term memory loss is one of the earliest symptoms.

Incidence

In 2009 the number of Australians with dementia was estimated to be 245,000. Due to our ageing population, the incidence of dementia is estimated to rise above 1.1 million by 2050. Every five years after the age of 65, the likelihood of living with dementia doubles and the disease affects one in four people aged 85 and over.

There are two types of Alzheimer's disease, sporadic and familial (hereditary). In the sporadic form, the disease is usually diagnosed after the age of 65 and is by far the most common form. In the less common familial form, the disease runs in families and usually affects people in their 40s or 50s.

Anatomy of the brain

Brain is full of cells called neurons.

Each neurone has a body which contains the genetic blueprint that directs and regulates the cell's activities.

Dendrites are the branches of the brain cells which collect information from other neurons.

Axon the 3rd part of the neurone is a cable which transmits messages to other neurones.

In Alzheimer's disease many neurones stop functioning, lose connections with other neurones, and die.

When neurones and their connections are destroyed, it involves memory, including hippocampus. Hippocampus lies below the temporal lobes of the brain.

Later it affects areas in the cerebral cortex responsible for language, reasoning and social behaviour.

Over time, a person with Alzheimer's gradually loses his or her ability to live and function independently. Ultimately, the disease is fatal.

Let's talk about Amyloid plaques.

Beta- amyloid protein involved in Alzheimer's comes in several different molecular forms that collect between neurons.

In the Alzheimer's brain, abnormal levels of this naturally occurring protein clump together to form plaques that collect between neurons and disrupt cell function.

Let's talk about the Neurofibrillary Tangles

Neurofibrillary tangles are abnormal accumulations of a protein called tau that collect inside neurons. This is a protein an important component of nerve cell, helping to maintain their function and structure: in the brain, distortions in the protein's molecular shape is associated with the onset of Alzheimer's disease.

Healthy neurons, in part, are supported internally by structures called microtubules, which help guide nutrients and molecules from the cell body to the axon and dendrites. In healthy neurons, tau normally binds to and stabilizes microtubules. In Alzheimer's disease, however, abnormal chemical changes cause tau to detach from microtubules and stick to other tau molecules, forming threads that eventually join to form tangles inside neurons. These tangles block the neuron's transport system, which harms the synaptic communication between neurons.

It appears that abnormal tau collects in certain regions of the brain that are involved in memory.

So, the Beta-amyloid clumps into plaques between neurons and the tau seems to spread throughout the brain.

Chronic inflammation

There are scavenging cells called glial cells in the brain to help keep the brain free of debris. One type of glial cells is called microglia and another called Astrocytes. They destroy waste and toxins in a healthy brain.

In Alzheimer's disease these cells fail to clear away the waste, debris and protein collections, including beta-amyloid plaque.

There is a gene called TREM2. Normally, TREM2 tells the microglia cells and astrocytes, to clear beta-amyloid plaques from the brain and helps fight inflammation in the brain.

In the brains of people where this gene does not function normally, plaques build up between neurons.

Summarising:

There is an abnormal build-up of a protein called beta amyloid which forms plaques outside the brain cells and disrupts its functions.

Tau is an important protein component of nerve cell, helping to maintain their function and structure: in the brain, distortions in the protein's molecular shape is associated with the onset of Alzheimer's disease.

These microglia and astrocytes collect around the neurons but fail to perform their debris-clearing function.

In all these situations the brain cells seem to dysfunction and die.

That is the story of Alzheimer's disease.

So far, we know how Alzheimer's disease builds up, but no solutions have been found to arrest the damage to the brain cells.

People who live a healthy lifestyle, especially from mid-life onwards, are less likely to develop Alzheimer's disease.

This includes doing regular physical exercise and keeping to a healthy weight, not smoking, eating a healthy balanced diet and drinking alcohol within the limits recommended by your doctor.

Keeping physically, mentally and socially active will help to reduce the risk of developing dementia.

