

Understanding Dementia

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What is Dementia?

A term that describes a group of symptoms associated with a decline in memory or other thinking skills severe enough to reduce a person's ability to perform everyday activities.



Symptoms of Dementia

Two or more of these areas are impaired:

- Memory (short term memory)
- Communication and language
- Ability to focus and pay attention
- Reasoning and judgment
- Visual perception

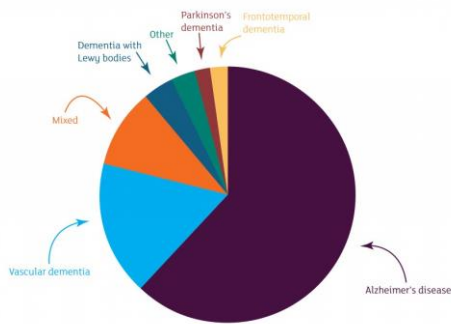


Examples : Difficulty keeping track of a purse or wallet, paying bills, planning and preparing meals, remembering appointments or traveling out of the neighborhood.

Types of Dementia

- **Alzheimer's Disease** - 60 to 80% of cases. Abnormal protein deposits are found in the brain.
- **Vascular Dementia**- second most common dementia type. Can occur after a stroke or with heart disease or diabetes. Blood flow in the brain is reduced and it cannot function as well.
- **"Senile Dementia"** reflects the formerly widespread but incorrect belief that serious mental decline is a normal part of aging.

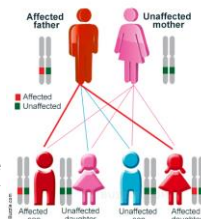
Causes of dementia



Genetics of Disease

Many diseases are caused by a permanent change in genes, also called a genetic mutation.

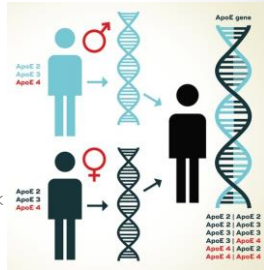
If a person inherits a genetic mutation from a parent, that can cause a disease to occur. Examples of inherited diseases are sickle cell anemia and early-onset familial Alzheimer's disease.



Genetics of Disease

In some diseases, a genetic variant may occur. A variant can increase or decrease a person's risk of developing a disease .

Genetic Risk Factor: Sometimes a genetic variant does not directly cause the disease, but increases the risk of getting the disease. This can occur in Alzheimer's Disease.



Genetics of Disease

Someone's risk of developing the disease is then influenced by many other factors including their exact genetic variants, the environment, and lifestyle of each person.

Identifying genetic variants may help researchers find the most effective ways to treat or prevent diseases, such as Alzheimer's Disease.



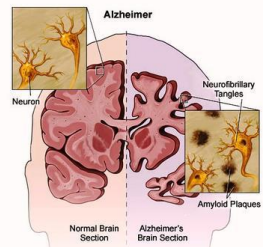
Alzheimer's Disease

Alzheimer's disease is a progressive brain disease characterized by the development of amyloid plaques and neurofibrillary, or tau, tangles.

loss of connections occur between nerve cells and death of nerve cells occurs.

Atrophy of the brain occurs.

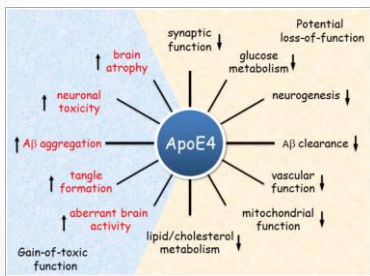
Two types of Alzheimer's:
 - early-onset
 - late-onset
 (both types have a genetic component).



Genetics of Alzheimer's Disease (AD)

- 25% of Alzheimer's patients have a strong family history of the disease.
- 1% directly inherit a gene mutation that causes early-onset Alzheimer's, also known as familial Alzheimer's disease.
- The gene called APOE can influence your risk for the more common late-onset type of Alzheimer's.

The ApoE4 Gene

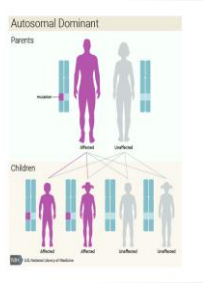


Early Onset AD

- Occurs between age 30 to mid-60s
- Represents less than 10 percent of all people with Alzheimer's.
- Some cases are caused by an inherited change in one of three identified genes, resulting in a type known as early-onset familial Alzheimer's disease
- Research suggests there may be a genetic component related to factors other than these three genes for other cases of AD.

Early Onset AD

- A child whose mother or father carries a genetic mutation for early-onset AD has a 50/50 chance of inheriting that mutation.
- If the mutation is in fact inherited, the child has a very strong probability of developing early-onset AD.



Research:

By observing the brain changes that occur in Early onset AD, scientists hope to discover how and why the disease develops.

Late Onset AD

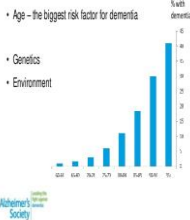
-Most people with Alzheimer's have the late-onset form of the disease

-Symptoms develop around age 65 and later.

-The causes of late-onset Alzheimer's are not yet completely understood.

-The cause is likely a combination of genetic, environmental, and lifestyle factors that affect a person's risk for developing the disease.

Dementia risk factors

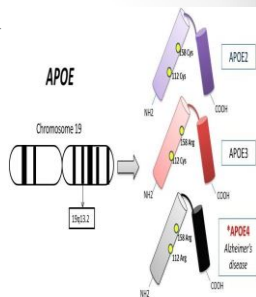


Genetics of AD


• Researchers have not yet found a specific gene that directly causes Alzheimer's Disease.

• Having one form of the APOE gene (on chromosome 19) does increase a person's risk (ApoE4)

• APOE comes in several different forms, or alleles



ApoE4 Genetics

- APOE4 increases the risk for Alzheimer's disease .
- It is associated with an earlier age of disease onset.
- A person can have zero, one, or two APOE 4 alleles.
- Having more APOE4 alleles increases the risk of developing Alzheimer's Disease. 
- APOE 4 is called a risk-factor gene because it increases a person's risk of developing the disease.

ApoE4 Genetics

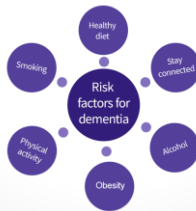
- The Good News:**
- Inheriting an APOE4 allele **does not** mean that a person will definitely develop Alzheimer's.
 - Some people with an APOE4 allele never get the disease.
- Although we may have a genetic predisposition to dementia, the way we choose to live our lives can influence the expression of those genetics.
- In other words, **you have the ability to decrease your chances of dementia** or improve early symptoms of dementia



Genetics of AD

While genetics play a strong role in the development of the disease, some people who develop Alzheimer's do not have any APOE4 alleles.

It is thought that lifestyle factors play a role



Genetics of AD

"Volunteers are critical to Alzheimer's disease genetics research. The more genetic information that researchers can gather and analyze from individuals and families—both healthy volunteers and those who may be at risk—the more clues they will have for finding additional risk-factor genes" -NIH

- To learn more about Alzheimer's genetics studies, contact NCRAD toll-free at 1-800-526-2839 or visit <http://ncrad.iu.edu>.

The Brain Inflammation Theory

While there are many theories out there, research is showing that dementia may be related to inflammation in the body and the brain.

Inflammation is caused by:

- Smoking
- Excessive Alcohol
- Diabetes
- Unhealthy Foods
- Stress



Current Hypothesis:

Inflammatory activity in the brain promotes dementia by increasing the production of amyloid, killing healthy neurons, and ultimately reducing the brain's ability to remove amyloid plaques

Reducing Inflammation

- Healthy diet
- Improve blood sugars and insulin sensitivity
- Avoid smoking and alcohol
- Increase physical exercise
- Manage weight
- Decrease stress
- Good sleep habits
- Control blood pressure and cholesterol



Other Causes of Memory Problems

Thinking and memory problems caused by other conditions may improve when the condition is treated or addressed:

- Depression or Anxiety
- Medication side effects
- Excess use of alcohol
- Thyroid problems
- Vitamin deficiencies



Treatments for Dementia

Lifestyle

- Address sleep problems or sleep apnea
- Increase physical activity
- Increase healthy whole foods and decrease processed foods
- Address depression or anxiety with your health provider
- Manage Stress
- Mental Exercise
- Social Interaction
- Avoid smoking and excessive alcohol
- Reduce BP and blood sugars

Medication

For AD and Vascular:
 -Cholinesterase Inhibitors (Namenda, Aricept, Exelon)
 *Helps boost a brain chemical that may help with memory. Does not change the course of the disease and only works for about 1.5-2yrs on average

For depression, anxiety or agitation and aggression:
 -Antidepressants
 -Antipsychotics (rarely)

Developing Treatments for Dementia

- An NIA-supported clinical trial in Colombia, South America, is testing the effectiveness of an amyloid (protein)clearing drug in symptom-free volunteers who are at high risk of developing early-onset AD.
- While this is promising, some experts believe that amyloid may not be the cause of dementia, but the result of dementia.
 (ex. Plaque formation in the arteries may be a symptom of vascular disease, not the cause of heart disease)
- It is unclear if clearing amyloid would reverse the symptoms or change the course of the disease.

Conclusions

- There are different types of dementia, AD is the most common and vascular is the second most common.
- Genetics can play a role in the development of AD, but does not necessarily mean you will develop the disease.
- People without the Apo4 gene may still develop dementia.
- The effectiveness of current medications is limited and there are currently no promising treatments for dementia/AD.

Conclusions

- Lifestyle factors play an enormous role in the development and the progression of dementia so adopt and maintain healthy habits from an early age to help avoid dementia!
- If you already have dementia, embracing the healthy lifestyle tips may help slow or improve symptoms.



Resources

Alzheimer's Association- Brain Health
https://www.alz.org/help-support/brain_health

Cleveland Clinic's 6 Pillar of Brain Health
<https://healthybrains.org/pillars/>

National Institute on Aging – Genetics of AD
<https://www.nia.nih.gov/health/alzheimers-disease-genetics-fact-sheet>

References

Alzheimer's Association:
<https://www.alz.org/alzheimers-dementia/what-is-dementia>

Alzheimer's Drug Discovery Foundation
<https://www.alzdiscovery.org/cognitive-vitality/blog/what-apoe-means-for-your-health>

Bredesen, Dale (2017) The End of Alzheimer's: The First Program to Prevent and Reverse Cognitive Decline. Ney York, NY: Avery.

Bright Focus Foundation
<https://www.brightfocus.org/alzheimers/article/new-angle-alzheimers-disease-inflammation-connection>

National Institutes of health
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2874260/>
<https://www.nia.nih.gov/health/alzheimers-disease-genetics-fact-sheet>
