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Alzheimer's Disease

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Alzheimer's Disease





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Introduction

Alzheimer's Disease is the most common form of dementia and can cause problems with memory, thinking and behavior. It is the sixth leading cause of mortality in the United States and risk factors include age, family history, genetics and new research even shows some factors that we have control over. Alzheimer's Disease has gained a lot of attention and about ninety percent of what we know about this disease has been discovered in the last 20 years (Alzheimer's Association, 2017). I chose this topic because Alzheimer's disease runs in my family and I used to work at a nursing home on the Alzheimer's and Dementia unit.

Who is at risk?

The greatest known risk factor for Alzheimer's is advancing age. A majority of other cases occur due to a combination of hereditary and genetics (Alzheimer's Association, 2017). Two other possible precursors to this disease include head injury or trauma and a person's heart health.

Mild Cognitive Impairment Duration: 7 years	Mild Alzheimer's Duration: 2 years	Moderate Alzheimer's Duration: 2 years	Severe Alzheimer's Duration: 3 years
Disease begins in Medial Temporal Lobe	Disease spreads to Lateral Temporal and Parietal Lobes	Disease spreads to Frontal Lobe	Disease spreads to Occipital Lobe
			
Symptoms: Short-Term memory loss	Symptoms Include: Reading problems Poor object recognition Poor direction sense	Symptoms Include: Poor judgment Impulsivity Short attention	Symptoms Include: Visual problems

Signs & Symptoms

The signs and symptoms of Alzheimer's disease can vary based on each patient and how far their disease has progressed. The classic symptoms of this disease are listed below and some symptoms based on stages are listed above.

1. Memory loss that disrupts daily life
 2. Challenges in planning or solving problems
 3. Difficulty completing tasks at home/work
 4. Confusion with time and place
 5. Trouble understanding visual images and spatial relationships
 6. Problems with speaking or writing
 7. Misplacing things
 8. Poor judgement
 9. Withdrawal from work or social activities
 10. Changes in mood or personality
- Increases in depressive symptoms and functional impairment occur in months leading up to AD diagnoses. (Gaugler, Hovater, Roth, Johnston... 2014, p.110).

Underlying Pathophysiology

Even though Alzheimer's disease is an irreversible brain disorder and usually occurs with advanced age it is not a normal part of aging. This disease is named after Dr. Alois Alzheimer who in 1906 noticed changes in the brain tissue of a woman who died of an unusual mental illness (National Institute on Aging, 2017). Once this woman died Dr. Alzheimer examined her brain and found abnormal clumps and tangled bundles of fibers.. Alzheimer's Disease (AD) is a progressive type of dementia that involves two hallmarks: extracellular amyloid plaques and intracellular neurofibrillary tangles. Amyloid plaques consist of protein beta amyloid which produces amyloid precursor protein. These amyloid plaques are believed to interfere with the brain's synaptic activity which causes neuron dysfunction and cell death.. Neurofibrillary tangles consist of the protein tau, that maintains the structure of the nerve cell, and when phosphorylation happens it prevents this protein from working effectively. Brain inflammation and oxidative stress are also characteristic in Alzheimer's disease (Alzheimer's Association, 2017)). Genome-wide associated studies have established multiple susceptible genes and mutations in early and late Alzheimer's disease:

1. Apolipoprotein E (APOE) Gene on chromosome 19
2. Abnormal amyloid precursor protein (APP) on chromosome 21
3. Abnormal presenilin 1 on chromosome 14
4. Abnormal presenilin 2 on chromosome 1

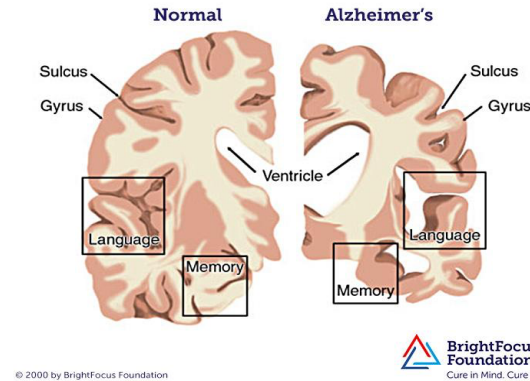
Significance of Pathophysiology

Since Alzheimer's is a neurodegenerative disease it leads to cell death and tissue loss as time goes on. The brain will begin to shrink which can affect many functions. In the brain of someone with Alzheimer's the cortex will shrivel overtime and damage memory, thinking and planning. The hippocampus which is located in the cortex is severely affected and does not allow the patient to form new memories. Ventricles in the brain get larger as seen in the figure above. This causes more fluid filled space in the brain. Besides the build up of amyloid proteins age related changes also harm neurons that can contribute to further damage. These can include atrophy to different parts of the brain, inflammation, free radical production and mitochondrial dysfunction (National Institute on Aging, 2017). Drugs used in the treatment of Alzheimer's disease are designed to fight the build-up of abnormal amyloid proteins. Cholinesterase inhibitors can help treat the cognitive symptoms of this disease. While these medications cannot stop the damage of Alzheimer's in the brain cells they can help decrease or stabilize symptoms by affecting certain chemicals involved in carrying messages along the cells in the brain (Alzheimer's Association, 2017). Four medications are currently used in the United States:

Donepezil (Aricept) used for all stages
Rivastigmine (Exelon) used for mild to moderate stages
Galantamine (Razadyne) used for mild to moderate stages
Memantine (Namenda) used for moderate to severe stages

All of these medications are cholinesterase inhibitors except Namenda which regulates glutamate and helps to improve mental function and perform daily living tasks (Alzheimer's Association, 2017)

Brain Cross-Sections



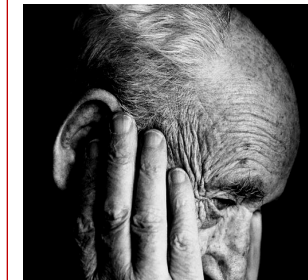
Implications for Nursing Care

- 1 in 9 people ages 65 and older are diagnosed with Alzheimer's disease, one third of people 85 years and older have the diagnosis. The number of cases is projected to triple by 2050 (Warshaw & Bragg, 2014, p.633)
- Early Stage of Alzheimer's will focus on diagnosis support and management at home. Patients usually present to their primary care providers to be evaluated for several weekly visits involving nurses, social workers, neurologists, geriatrician and psychiatrist (Warshaw & Bragg, 2014, p. 634).
- In the middle stage of Alzheimer's nurses will notice increase symptoms and patients may need around-the-clock supervision due to cognitive or functional limitations. Caregivers may begin to see changes in the patients' personality and mood.
- The last stage nurses will notice progressive cognitive decline and extensive damage to the brain. It is crucial that nurses that are helping patients in this stage also support family members in making difficult decisions about levels and type of care provided.
- Nurse Practitioners should guide care with individualized plans that account for each patient's needs, values and goals (Warshaw & Bragg, 2014, p. 638).
- Primary prevention may help reduce some modifiable risk factors for Alzheimer's disease.
- The main modifiable risk factors include diabetes mellitus, midlife hypertension, midlife obesity, physical inactivity, depression, smoking and low educational attainment (Norton, Matthews, Barnes, Yaffe... 2014, p.788).

Conclusion

Worldwide public health crisis is continuing to grow due to the world's population aging and lack of effective interventions. Since the baby boomers in the United States are getting older this is going to create a serious crisis in not only care but cost. The United States has developed the National Plan to Address Alzheimer's Disease to provide tools for clinicians, assist caregivers and patients with AD, raise public awareness and to advance research (Fargo, Aisen, Alber, Au... 2014, p. 430). Main focus points of the United States National Plan to Address Alzheimer's include:

1. Development of targets and interventions
2. Drug development
3. Development of nonpharmacologic interventions
4. Biomarkers of disease progression
5. Research
6. Clinical Trials



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