Alzheimer’s Disease Screening

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Project Goals

- Develop a plan for the screening of the general public for Alzheimer’s Disease

Background

Cause:
- As the body ages, β-amyloid plaques and neurofibrillary tangles may build up in the brain
- These block communication between cells

Diagnosis:
- Most widely used form of definitive diagnosis is an autopsy
- Patients can be diagnosed with “Alzheimer’s Type” pathology based on symptoms such as memory loss and other cognitive tests
- A newly developed, accurate test for AD is an PET scan, administered with radioactive tracers
- Effective diagnosis of the disease can be achieved through an efficient, widespread system of screening

PET Scans

- Positron emission tomography shows how well cells are working based on the amount of sugar or oxygen the cell consumes
- A radioactive tracer can be given to the patient so that the PET scan will show the targeted cell

PET Scan Screening For Alzheimer’s

- Used to measure the levels of β-amyloid plaques as well as neurofibrillary tangles
- A radioactive tracer, 18F-FDDNP, binds to the plaques and tangles
- An administered PET scan shows where the tracer is greater in concentration
- FDG PET scans use the tracer 18 FDG to show brain metabolic activity
- Administration of these two tests is enough to diagnose Alzheimer’s Disease

Diagnostic Screening System

“At-risk” patients will be given a standard cognitive assessment called a Mental Status Examination (MSE) as a part of their yearly physical examination
- If the patient’s score declines significantly over the course of one or more years, the physician must refer them to a hospital for plaque screening and a FDG PET scan
- If the results show that the patient has signs of AD, treatment will be carried out

Mental Status Examination (MSE)

- Evaluates:
  - Affect and mood
  - Attitude
  - Appearance
  - Behavior
  - Cognition
  - Insight judgment
  - Speech and language
  - Thought content
  - Thought processes
- The frontal lobe deals with thinking and planning
- Temporal lobe is responsible for memory and learning
- These are the two areas affected most by Alzheimer’s

Funding and Cost

- The average cost of a basic PET scan is between $3,000 and $6,000
- Most insurance companies will cover the cost if it has been clinically indicated
- Changes in Medicare would result in the reimbursement of these costs to patients of a certain age

Ethics

- Does the treatment really improve their quality of life?
- Will the screening create more paranoia and harm?
- Will treatment create false hope?

Conclusion

- An organized, widespread screening system for Alzheimer’s Disease will result in the earlier treatment of patients and possibly a decrease in the mortality rate due to this degenerative condition.

Acknowledgements


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