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 a 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

“At Risk Patients”
• Patients already diagnosed with “Alzheimer’s type” pathology
• Those with a family history of Alzheimer’s over the age of 40

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


Adams, David. Personal interview. 18 Nov. 2009.


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