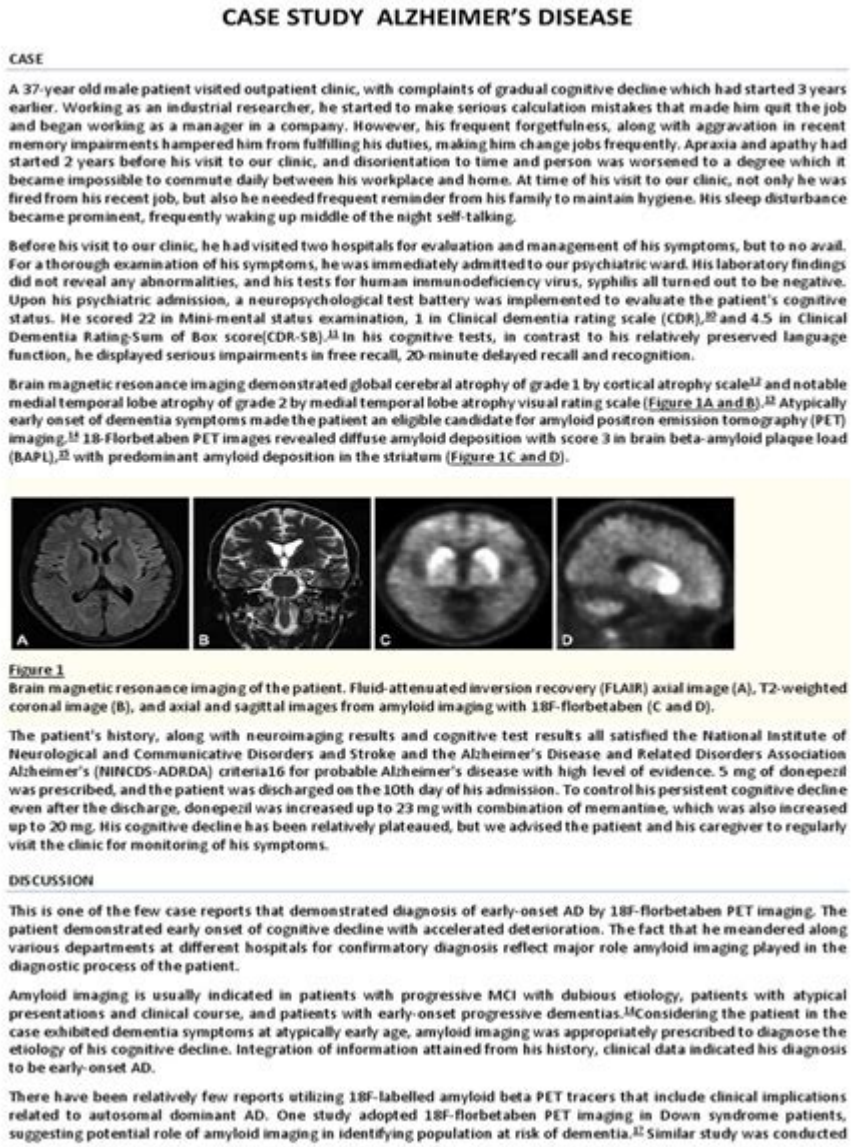
Alzheimers Disease Case Study



CASE STUDY ALZHEIMER'S DISEASE

CASE

A 37-year old male patient visited outpatient clinic, with complaints of gradual cognitive decline which had started 3 years earlier. Working as an industrial researcher, he started to make serious calculation mistakes that made him quit the job and began working as a manager in a company. However, his frequent forgetfulness, along with aggravation in recent memory impairments hampered him from fulfilling his duties, making him change jobs frequently. Apraxia and apathy had started 2 years before his visit to our clinic, and disorientation to time and person was worsened to a degree which it became impossible to commute daily between his workplace and home. At time of his visit to our clinic, not only he was fired from his recent job, but also he needed frequent reminder from his family to maintain hygiene. His sleep disturbance became prominent, frequently waking up middle of the night self-talking.

Before his visit to our clinic, he had visited two hospitals for evaluation and management of his symptoms, but to no avail. For a thorough examination of his symptoms, he was immediately admitted to our psychiatric ward. His laboratory findings did not reveal any abnormalities, and his tests for human immunodeficiency virus, syphilis all turned out to be negative. Upon his psychiatric admission, a neuropsychological test battery was implemented to evaluate the patient's cognitive status. He scored 22 in Mini-mental status examination, 1 in Clinical dementia rating scale (CDR),[10] and 4.5 in Clinical Dementia Rating-Sum of Box score(CDR-SB).[11] In his cognitive tests, in contrast to his relatively preserved language function, he displayed serious impairments in free recall, 20-minute delayed recall and recognition.

Brain magnetic resonance imaging demonstrated global cerebral atrophy of grade 1 by cortical atrophy scale[12] and notable medial temporal lobe atrophy of grade 2 by medial temporal lobe atrophy visual rating scale (Figure 1A and B).[13] Atypically early onset of dementia symptoms made the patient an eligible candidate for amyloid positron emission tomography (PET) imaging.[14] 18-Florbetaben PET images revealed diffuse amyloid deposition with score 3 in brain beta-amyloid plaque load (BAPL),[15] with predominant amyloid deposition in the striatum (Figure 1C and D).

Figure 1
Brain magnetic resonance imaging of the patient. Fluid-attenuated inversion recovery (FLAIR) axial image (A), T2-weighted coronal image (B), and axial and sagittal images from amyloid imaging with 18F-florbetaben (C and D).

The patient's history, along with neuroimaging results and cognitive test results all satisfied the National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's Disease and Related Disorders Association Alzheimer's (NINCDS-ADRDA) criteria16 for probable Alzheimer's disease with high level of evidence. 5 mg of donepezil was prescribed, and the patient was discharged on the 10th day of his admission. To control his persistent cognitive decline even after the discharge, donepezil was increased up to 23 mg with combination of memantine, which was also increased up to 20 mg. His cognitive decline has been relatively plateaued, but we advised the patient and his caregiver to regularly visit the clinic for monitoring of his symptoms.

DISCUSSION

This is one of the few case reports that demonstrated diagnosis of early-onset AD by 18F-florbetaben PET imaging. The patient demonstrated early onset of cognitive decline with accelerated deterioration. The fact that he meandered along various departments at different hospitals for confirmatory diagnosis reflect major role amyloid imaging played in the diagnostic process of the patient.

Amyloid imaging is usually indicated in patients with progressive MCI with dubious etiology, patients with atypical presentations and clinical course, and patients with early-onset progressive dementias.[14]Considering the patient in the case exhibited dementia symptoms at atypically early age, amyloid imaging was appropriately prescribed to diagnose the etiology of his cognitive decline. Integration of information attained from his history, clinical data indicated his diagnosis to be early-onset AD.

There have been relatively few reports utilizing 18F-labelled amyloid beta PET tracers that include clinical implications related to autosomal dominant AD. One study adopted 18F-florbetaben PET imaging in Down syndrome patients, suggesting potential role of amyloid imaging in identifying population at risk of dementia.[17] Similar study was conducted

Understanding Alzheimer's Disease through a Case Study

Alzheimer's disease is a progressive neurological disorder that causes brain cells to degenerate and die, leading to a decline in cognitive function and memory. This case study aims to explore the intricacies of Alzheimer's disease through the lens of an individual patient, highlighting symptoms, diagnosis, and the impact on family and caregivers. By examining this case, we can better appreciate the challenges presented by this complex condition and the importance of early detection and intervention.

Case Study Overview

Patient Background:

- Name: Mary Johnson
- Age: 72 years
- Gender: Female
- Living Situation: Lives alone in a suburban community
- Medical History: Mild hypertension, no significant psychiatric history, and a family history of Alzheimer's disease (her mother was diagnosed at age 75).

Mary was an active member of her community and enjoyed hobbies such as gardening and reading. However, over the past two years, her family noticed subtle changes in her behavior and cognitive abilities.

Initial Symptoms

Mary's family began to observe the following symptoms:

1. Memory Loss:
- Frequently forgetting recent conversations and misplacing items.
- Difficulty recalling the names of familiar objects or people.

2. Cognitive Decline:
- Challenges with planning and organizing her daily activities.
- Problems with problem-solving and handling financial matters.

3. Personality Changes:
- Increased irritability and mood swings.
- Withdrawal from social activities she once enjoyed.

4. Disorientation:
- Occasional confusion about time and place.
- Difficulty following a conversation or maintaining focus.

These early signs prompted Mary's family to seek medical advice.

Diagnosis and Medical Evaluation

Upon consultation with a neurologist, Mary underwent a series of evaluations to determine the cause of her symptoms. The diagnostic process included:

1. Comprehensive Medical History

The neurologist conducted a thorough review of Mary’s medical history, including her family history of Alzheimer's disease, current medications, and any other health issues.

2. Cognitive Testing

Mary participated in several cognitive assessments, including:

- Mini-Mental State Examination (MMSE): A 30-point questionnaire used to measure cognitive impairment.
- Montreal Cognitive Assessment (MoCA): A brief screening tool for mild cognitive dysfunction.

Her scores indicated significant deficits in memory, attention, and executive functioning.

3. Neuroimaging

Mary underwent magnetic resonance imaging (MRI) to assess the structure of her brain. The MRI revealed:

- Atrophy in the hippocampus: This area is critical for memory formation.
- Generalized brain atrophy: Indicative of neurodegeneration.

4. Laboratory Tests

Blood tests were conducted to rule out other possible causes of cognitive impairment, such as vitamin deficiencies, thyroid disorders, and infections.

Based on the combination of cognitive assessments, neuroimaging results, and the elimination of other potential causes, Mary was diagnosed with Alzheimer's disease.

Impact on Daily Life and Caregiver Support

The diagnosis of Alzheimer's disease not only affected Mary but also had significant implications for her family and caregivers. Understanding these impacts is crucial for developing effective support systems.

1. Daily Life Adjustments

As Mary's condition progressed, her family made several adjustments to help her maintain

independence while ensuring her safety:

- Organizing the Home: Family members labeled rooms and important items to help Mary navigate her environment.
- Routine Establishment: A consistent daily routine was established to reduce confusion and anxiety.
- Memory Aids: Use of calendars, notes, and medication reminders became essential for her day-to-day functioning.

2. Emotional and Psychological Effects

Mary and her family experienced various emotional challenges, including:

- Fear and Anxiety: Concerns about Mary’s future and the progression of the disease.
- Depression: Mary showed signs of depression as she grappled with her diagnosis and changing abilities.
- Frustration: Family members felt frustrated and helpless at times, especially when faced with Mary’s memory lapses.

3. Caregiver Support

The role of caregivers became increasingly important as Mary’s condition progressed. Family members engaged in the following practices to support each other and Mary:

- Education: Family members attended workshops and support groups to learn more about Alzheimer's disease and effective caregiving strategies.
- Respite Care: They arranged for part-time professional caregivers to provide relief and give family members breaks when needed.
- Open Communication: Regular family meetings were held to discuss challenges and share feelings, fostering a supportive environment.

Intervention Strategies and Treatment Options

While there is currently no cure for Alzheimer's disease, various intervention strategies and treatment options can help manage symptoms and improve quality of life for patients like Mary.

1. Pharmacological Treatments

Mary’s neurologist prescribed medications to help manage her symptoms. These included:

- Cholinesterase Inhibitors: Such as Donepezil (Aricept), which can help improve memory and thinking skills in some patients.
- Memantine (Namenda): A medication that may help with symptoms of moderate to severe Alzheimer's disease.

2. Non-Pharmacological Interventions

In addition to medications, various non-pharmacological interventions were employed:

- Cognitive Stimulation Therapy (CST): Engaging Mary in activities that stimulate thinking, memory, and social interaction.
- Physical Activity: Regular exercise to enhance physical health and improve mood.
- Music and Art Therapy: Activities that can evoke memories and promote emotional well-being.

Conclusion

Mary’s case study exemplifies the profound effects of Alzheimer's disease on individuals and their families. Through early detection, proper medical intervention, and supportive caregiving, it is possible to manage symptoms and improve quality of life for those affected by this condition.

Awareness and understanding of the disease can empower families and communities to provide the necessary support, fostering resilience in the face of Alzheimer's disease. As research continues to evolve, there remains hope for new therapeutic strategies and ultimately, a cure.

Frequently Asked Questions

What are the key findings from recent Alzheimer's disease case studies?

Recent case studies have highlighted the importance of early diagnosis through biomarkers and imaging techniques, as well as the effectiveness of personalized treatment plans that include cognitive therapies and lifestyle modifications.

How do case studies help in understanding the progression of Alzheimer's disease?

Case studies provide in-depth insights into individual experiences, revealing variations in symptoms, progression rates, and responses to treatment, thereby contributing to a broader understanding of the disease's heterogeneity.

What role do caregivers play in Alzheimer's disease case studies?

Caregivers are often central to case studies, providing crucial information about patient behavior, daily challenges, and the impact of caregiving on their own mental and physical health, which can inform support services and interventions.

How are lifestyle factors examined in Alzheimer's disease case studies?

Lifestyle factors such as diet, exercise, and social engagement are often analyzed in case studies to explore their potential protective effects against cognitive decline and to identify modifiable risk factors that could improve patient outcomes.

What ethical considerations arise in Alzheimer's disease case studies?

Ethical considerations include informed consent, particularly in cases where patients may have impaired cognitive function, as well as the privacy and confidentiality of sensitive health information shared during research.

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