

## Multiple Choice Questions Section

The Neurosciences Journal includes this section of multiple choice questions as part of its commitment to continuous education and learning in Neurosciences. Experts in various neuroscience specialties are invited to participate with their knowledge and expertise in this section.

Neurology, neurosurgery, and other board residents are encouraged to read this section to improve their knowledge and direct their reading for written examinations.

### Cognitive impairment

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#### Choose the most appropriate single answer.

1. A 65-year-old male presents with a 2-year history of forgetfulness. He needed to make more reminder notes and alerts on his smart phone to be on schedule. He is in charge of managing a small business, and noticed he cannot easily recall the names of new clients. Otherwise, the business is running well, and his decisions remain sound. His family and colleagues have noticed his struggles with recall but there have not been any changes in his performance. There was no significant past medical or surgical history. His mother had dementia in her senior years before she died from pneumonia. The neurological exam was normal including a full score on the Mini-Mental State Exam. On the Wechsler memory scale, he scored slightly lower than the controls and additional neuropsychological assessments revealed normal performance of the remaining cognitive domains. What is the most likely diagnosis?
  - a. Mild Alzheimer's dementia
  - b. Mild cognitive impairment
  - c. Pseudo-dementia secondary to depression and work related stress
  - d. Cognitive changes associated with aging
2. A 70-year-old woman with hypertension is referred by the family physician due to progressing memory complaints over the past 18 months. Her older sister died with Alzheimer's disease 2 years earlier, and worries she will develop the same fate. After a thorough neurological evaluation, the diagnosis is amnesic-mild cognitive impairment. Her MRI was normal. What is her risk of converting to Alzheimer's disease?
  - a. 5-15% conversion rate over 5 years
  - b. 20-40% annual conversion rate
  - c. 5-15% annual conversion rate
  - d. <1% with a normal MRI
3. A 70-year-old retired engineer with a previous history of diabetes and a transient ischemic attack one year earlier is seeking a second opinion about his cognitive problem. He had recently seen a physician who diagnosed him with amnesic-mild cognitive impairment and advised him to stay involved in social and other cognitive activities in addition to tight blood sugar control and regular exercise. What does current evidence recommend about management at this stage?
  - a. Starting a choline-esterase inhibitor
  - b. Starting memantine
  - c. Combining memantine with any choline-esterase inhibitor
  - d. No pharmacological intervention is required

4. A 59-year-old male physician has been suffering from a prominent rest tremor in the right upper extremity for the past 6 years; there is mild rigidity and bradykinesia more on the right than the left. Levodopa/Carbidopa treatment has controlled his symptoms reasonably well, and he remains in practice. His cognitive assessment 5 years earlier was normal. He has started to notice some difficulty with short-term memory and planning complex tasks. On cognitive assessment there is impairment on the Trail making test and mild planning difficulty on the clock drawing. His performance on memory tasks was average. Other cognitive domains were normal including verbal fluency, figure copying tasks, and neuropsychiatric assessment. What can you inform this patient about his risk of developing dementia?
- He currently has mild dementia, and it is expected to slowly worsen over the coming 3-5 years.
  - Dementia with Parkinson's disease has a cholinergic deficit and he should try a cholinesterase inhibitor.
  - His current clinical profile suggests a lower likelihood of developing dementia over the next 3-5 years.
  - Levodopa responsiveness can be seen in other degenerative disorders, and he should be reclassified as dementia with Lewy bodies.
5. A retired 69-year-old university professor has been struggling with word finding difficulties for the past year. He cannot recall certain words mid-sentence and sometimes has to talk around the lost word in order to get his message across. Other than controlled diabetes and hypertension there is no relevant past or family history. His exam showed that there is a decrease in his naming ability, more prominent with low frequency words. His expressive language showed intact grammar, and rare phonological errors. His, repetition, reading and word comprehension were normal. His performance on short-term memory tests was borderline normal and there were no neurological deficits. What is the most likely underlying pathology associated with the clinical syndrome?
- Frontotemporal dementia-Tau.
  - Frontotemporal dementia-TDP.
  - Frontotemporal dementia-FUS.
  - Alzheimer's dementia-neurofibrillary tangles and amyloid plaques.

## Answers:

### 1. b

The patient's performance on neuropsychological testing revealed isolated deficit in the memory domain of cognition, resulting in an amnesic type of mild cognitive impairment (MCI). The patient does not meet criteria for dementia. Memory changes related to aging should be similar to age-matched controls. Depression and stress are usually associated with changes suggesting reduced effort and attention.<sup>1</sup>

### 2. c

This patient with a single domain type of MCI is at risk for progressing to dementia. While there is some variability in the literature, the annual conversion rate appears to be 5-15%.<sup>1,2</sup>

### 3. d

Various studies have shown mixed results of treating MCI with a choline esterase inhibitor. Pooled analyses have generally not suggested a benefit of memantine or cholinesterase inhibitors in MCI.<sup>3,4</sup>

### 4. c

Executive deficits without dementia are common in Parkinson's disease patients. The additional presence of language disturbance, visuospatial impairment, an akinetic-rigid picture, older age and abnormal cognition at baseline would point to higher risks of developing dementia at 5 years. The long duration of motor symptoms before the appearance of cognitive symptoms does not support Lewy Body Dementia.<sup>5</sup>

### 5. d

This patient presents with a primary progressive aphasia known as the "logopenic variant". More prominent grammatical errors and apraxia of speech would suggest non-fluent primary progressive aphasia, and impaired word comprehension is usually seen in the semantic variant. The logopenic variant has been found to be associated with Alzheimer's type pathology in more than 70% of cases.<sup>6</sup>

## References

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