The Neuroscience Journal introduces this new section on 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.

**Hippocampal sclerosis**

_Sonia Khan, FRCP (Lond), FRCP (Edin)._  
From the Division of Neurology, Riyadh Military Hospital, Riyadh, Kingdom of Saudi Arabia.  
Address correspondence to: Dr. Sonia Khan, Division of Neurology, Riyadh Military Hospital, PO Box 7897, Riyadh 11159, Kingdom of Saudi Arabia. E-mail: skhan@rmh.med.sa

**Choose the most appropriate single answer.**

1. In a surgical series of patients with medically intractable temporal lobe epilepsy, hippocampal sclerosis occurs in:
   a) 10% of cases  
   b) 30% of cases  
   c) 50% of cases  
   d) 70% of cases  
   e) 90% of cases

2. Clinical characteristics of hippocampal sclerosis include all the following except:
   a) Prolonged febrile convulsions in early childhood in 40% cases.  
   b) The mean age onset is typically during the second decade of life.  
   c) Epi gastric aura not infrequently occurs in isolation.  
   d) Loss of consciousness occurs with maximum depth at the beginning of the seizure after the aura.  
   e) Versive eye movements typically occur early in the seizure.

3. Electroencephalographic characteristics of hippocampal sclerosis include:
   a) Bilateral spike wave discharges in 60% of cases interictally.  
   b) Bilateral independent temporal discharges in 40% of cases interictally.  
   c) Lateralized ictal theta frequency rhythmic activity in 30% of cases.  
   d) Bilateral ictal theta frequency rhythmic activity in 80% of cases.  
   e) Lateralized post ictal slowing occurs in only 10% of cases.

4. The following is true in neuropsychological and neuropsychiatric manifestations of hippocampal sclerosis except:
   a) The degree of memory impairment is dependent on the degree of involvement of mesial temporal structures.  
   b) The risk of psychiatric illness in patients with hippocampal sclerosis is 20-40% of patients.  
   c) Anxiety and personality disorders are unique neuropsychiatric comorbidities with hippocampal sclerosis.  
   d) Depression is not a contraindication for temporal lobectomy.  
   e) Memory impairment often relates to the recall of newly acquired information or consolidated long-term memory.

5. Pathological characteristics of hippocampal sclerosis.
   a) Neuronal loss limited in the CA1 subfield of the hippocampal formation.  
   b) Neuronal loss limited to the CA2 subfield of the hippocampal region.  
   c) Neuronal loss limited in the CA1, CA2, CA3, and CA4 regions in the hippocampus.  
   d) Neuronal loss in the CA1, CA2, CA3, and CA4 in the hippocampus.  
   5. Neuronal loss in the CA1, CA2, and CA3 of the hippocampus with relative sparing of the CA2 region.
Answers:

1. d) In a surgical series of patients with intractable temporal lobe epilepsy, most (70%) had pathological evidence of hippocampal sclerosis.¹

2. e) A strong association of hippocampal sclerosis and early prolonged febrile convulsions was identified in both surgical and non-surgical series. The typical age onset of epilepsy in patients with hippocampal sclerosis is the second decade. The most common auras identified are epigastric followed by psychic aura and more than 90% of patients with hippocampal sclerosis have auras. The auras not infrequently occur in isolation. When the aura is followed by a seizure, the typical seizure is characterized by decreased behavioral activity and staring, which tend to be maximum at the beginning with partial recovery during later stages of the seizure. The main clinical component of the ictal period is oral and ipsilateral hand automatisms. Head turning may occur early during the seizure, but versive eye movements with contralateral head and eye forced deviation occur late in the seizure, and indicate suprasylvian spread. Generalized tonic clonic seizures occur in 25-50% of cases.²

3. b) Unilateral or bilateral temporal slowing, spikes, or sharp waves are the main interictal EEG characteristics of hippocampal sclerosis with interictal epileptiform discharges usually restricted to the anterior temporal electrodes, or sphenoidal electrodes. Bilateral independent temporal discharges occur in 14-42% of cases. Scalp EEG ictal onset is usually lateralized in the majority of patients with ipsilateral theta frequency at onset in 90% of patients studied. Lateralized postictal slowing occurs in 40-67% of cases.³

4. c) Memory impairment is commonly encountered in patients with hippocampal sclerosis. Memory impairment is often related to recall of newly acquired information or consolidated long-term memory. The degree and the nature of impairment (verbal versus non-verbal memory or both) are dependent on the degree of the involvement of the mesial structures. An increased risk of psychiatric illness occurs in 20-40% of patients with refractory epilepsy including those with hippocampal sclerosis. There is no consensus that there is a neuropsychiatric profile unique to hippocampal sclerosis.⁴

5. e) Hippocampal sclerosis is characterized by marked neuronal loss in the CA₁ subfield of the hippocampal formation, a moderate loss of neurons in the endofolium, which includes CA₃ and CA₄, and relative sparing of the CA₂ region. The subiculum, entorhinal cortex, and other temporal gyri are relatively resistant to cell loss.⁵

References