Exam Master Neuro Practice Exam (Sample)

Study Guide

Everything you need from our exam experts!

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Questions

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1. **Which genetic mutation is associated with Huntington's disease?**

   A. Deletion of the huntingtin gene

   B. CAG gene expansion

   C. Point mutation in the HD gene

   D. Trinucleotide repeat contraction

2. **What is the most likely diagnosis for a 32-year-old man presenting with muscle weakness, lack of coordination, and double vision?**

   A. Multiple sclerosis

   B. Parkinson's disease

   C. Peripheral neuropathy

   D. Myasthenia gravis

3. **What is the most likely diagnosis for a patient with confusion, nausea, high fever, and seizures after working in the garden?**

   A. Heat stroke

   B. Neuroleptic malignant syndrome

   C. Hyperthermia

   D. Heat exhaustion

4. **A 60-year-old man with cognitive decline has no history of psychiatric issues. What could be a likely diagnosis?**

   A. Pseudodementia

   B. Dementia of the Alzheimer's type

   C. Substance-induced dementia

   D. Normal pressure hydrocephalus

5. **Which organism is most commonly associated with community-acquired bacterial meningitis in young adults?**

   A. Streptococcus pneumoniae

   B. Neisseria meningitidis

   C. Haemophilus influenzae

   D. Escherichia coli

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6. What is the likely cause of detrusor muscle instability in a 70-year-old woman?

A. Autonomic dysfunction

B. Neuropathy from diabetes

C. Normal-pressure hydrocephalus

D. Age-related atrophy

7. What should be the immediate next step if an elderly patient shows signs of self-neglect and poses a potential danger?

A. Conduct a psychiatric evaluation

B. Contact adult protective services

C. Administer emergency medication

D. Schedule follow-up visits

8. A 42-year-old woman describes her hand tremor that worsens with movement. What disorder does this likely represent?

A. Parkinson's disease

B. Essential tremor

C. Cerebellar tremor

D. Dystonic tremor

9. What is the most likely diagnosis for a 32-year-old woman with a family history of tremors and symptoms worsened by emotional stress?

A. Huntington's disease

B. Essential tremor

C. Parkinson's disease

D. Multiple sclerosis

10. What is a common finding in patients diagnosed with restless legs syndrome (RLS)?

A. Abnormal electrical impulse conduction study

B. Increased muscle strength

C. Normal electromyography results

D. Consistent pain relief with rest

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Answers

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1. B
2. A
3. A
4. B
5. B
6. C
7. B
8. B
9. B
10. A

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Explanations

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1. Which genetic mutation is associated with Huntington's disease?

A. Deletion of the huntingtin gene

B. CAG gene expansion

C. Point mutation in the HD gene

D. Trinucleotide repeat contraction

Huntington's disease is characterized by a specific genetic mutation involving the expansion of a CAG trinucleotide repeat in the HTT gene, which encodes the huntingtin protein. In healthy individuals, the number of CAG repeats is typically between 10 and 35. However, in individuals with Huntington's disease, this repeat number exceeds 36, leading to the production of an abnormal version of the huntingtin protein. The expanded protein aggregates in neurons, contributing to the neuronal degeneration that defines the disorder. This mutation is classified as a gain-of-function mutation due to the toxic effects of the abnormal protein. The consequent neurodegeneration results in the characteristic symptoms of Huntington's disease, including chorea, psychiatric disorders, and cognitive decline. The association of CAG expansion with the disease was established through genetic studies, making it the definitive mutation linked to Huntington's disease. In contrast, other options such as deletion of the huntingtin gene, a point mutation, or a contraction of trinucleotide repeats do not account for the mechanism of Huntington's disease. Each of these scenarios does not lead to the same pathological consequences seen in the disorder.

2. What is the most likely diagnosis for a 32-year-old man presenting with muscle weakness, lack of coordination, and double vision?

A. Multiple sclerosis

B. Parkinson's disease

C. Peripheral neuropathy

D. Myasthenia gravis

The presentation of muscle weakness, lack of coordination, and double vision is highly suggestive of multiple sclerosis. This condition is an autoimmune disorder that affects the central nervous system, leading to demyelination of nerve fibers. The symptoms reported are common in multiple sclerosis due to the impact on various areas of the nervous system that control motor function and coordination, as well as those involved in eye movements and muscle control. Double vision, in particular, can occur due to the involvement of cranial nerves that control eye movements, which is a frequent early symptom in multiple sclerosis. Muscle weakness and lack of coordination also align with the demyelinating nature of the disease, where nerve signal transmission is impaired, leading to difficulties in muscle control. Other conditions, while potentially presenting with similar symptoms, do not typically encapsulate the combination of all these symptoms as prominently as multiple sclerosis does. Parkinson's disease primarily affects motor control and usually presents with resting tremor, rigidity, and bradykinesia, rather than the coordination issues and visual disturbances described here. Peripheral neuropathy could lead to muscle weakness but typically does not cause double vision or coordination issues tied to central nervous system involvement. Myasthenia gravis presents with muscle weakness that fluctuates with activity but typically does

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3. What is the most likely diagnosis for a patient with confusion, nausea, high fever, and seizures after working in the garden?

A. Heat stroke

B. Neuroleptic malignant syndrome

C. Hyperthermia

D. Heat exhaustion

The symptoms of confusion, nausea, high fever, and seizures in a patient who has been working in the garden suggest a serious heat-related condition. Heat stroke is characterized by a significant elevation in body temperature, typically above 104°F (40°C), along with altered mental status such as confusion or seizures. The exposure to high temperatures while working outdoors increases the risk for heat stroke. The presence of high fever and seizures indicates that the central nervous system is being affected possibly due to the extreme hyperthermia. In heat stroke, the body's mechanisms to regulate temperature fail, leading to a life-threatening condition that requires immediate medical attention. Other conditions such as heat exhaustion and hyperthermia may present with similar symptoms like nausea and fatigue but typically do not result in altered mental status and seizures to the degree seen in heat stroke. Neuroleptic malignant syndrome is a potential differential diagnosis but is associated with antipsychotic medication and may not be relevant given the context of gardening, where heat exposure is a more significant concern. Taking all of this into account, the diagnosis of heat stroke aligns the best with the described clinical presentation, emphasizing the need to recognize and treat this emergency condition promptly.

4. A 60-year-old man with cognitive decline has no history of psychiatric issues. What could be a likely diagnosis?

A. Pseudodementia

B. Dementia of the Alzheimer's type

C. Substance-induced dementia

D. Normal pressure hydrocephalus

In this scenario, the patient is a 60-year-old man experiencing cognitive decline without any prior history of psychiatric disorders, making dementia of the Alzheimer's type a likely diagnosis. Alzheimer's disease is the most common form of dementia, particularly in individuals over 60, and is characterized by progressive cognitive impairment. Key features of Alzheimer's include memory loss, difficulties in planning or performing familiar tasks, confusion with time or place, and changes in mood or personality, which align with observations often made in cognitive decline cases. Since this patient has no background of psychiatric issues, the likelihood of cognitive decline stemming from a functional psychiatric disorder is lower, making Alzheimer's a more fitting explanation for his symptoms. Other potential options present varying degrees of differential diagnoses but generally hold less relevance given the patient's profile. Pseudodementia, for example, typically arises from major depressive disorder, which this patient does not seem to exhibit. Similarly, substance-induced dementia would require a history of substance use or exposure that contributes to cognitive decline, and normal pressure hydrocephalus would usually present with a characteristic triad of symptoms including gait disturbance and urinary incontinence alongside cognitive decline, which are not mentioned here. Thus, dementia of the Alzheimer's type emerges as the most plausible diagnosis in this case

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5. Which organism is most commonly associated with community-acquired bacterial meningitis in young adults?

A. Streptococcus pneumoniae

B. Neisseria meningitidis

C. Haemophilus influenzae

D. Escherichia coli

Neisseria meningitidis is the organism most commonly associated with community-acquired bacterial meningitis in young adults. This bacterium is known for its potential to cause outbreaks of meningococcal disease, especially in settings such as college dormitories or military barracks, where close living quarters facilitate transmission. The virulence factors of Neisseria meningitidis, including its polysaccharide capsule, allow it to evade the immune system, and it can lead to rapid onset of severe symptoms, making it a critical pathogen in this age group. Vaccination efforts against Neisseria meningitidis have been implemented in many regions, but cases can still occur, which highlights its prominence as a causative agent of meningitis among young adults. In contrast, while Streptococcus pneumoniae is also a significant cause of bacterial meningitis, it tends to be more prevalent in younger children or the elderly. Haemophilus influenzae type b (Hib) has largely been controlled by vaccination and is not as commonly associated with meningitis in young adults anymore. Escherichia coli is primarily linked to meningitis in neonates rather than in young adults. The specific association of Neisseria meningitidis with outbreaks and its epidemiological significance in

6. What is the likely cause of detrusor muscle instability in a 70-year-old woman?

A. Autonomic dysfunction

B. Neuropathy from diabetes

C. Normal-pressure hydrocephalus

D. Age-related atrophy

Detrusor muscle instability, which leads to symptoms such as urinary urgency and incontinence, can be influenced by various factors, especially in older adults. In this context, normal-pressure hydrocephalus plays a significant role. Normal-pressure hydrocephalus is characterized by the triad of gait disturbance, dementia, and urinary incontinence. The accumulation of cerebrospinal fluid (CSF) can create pressure on brain structures that regulate bladder function, including the pontine micturition center. As a result, this condition can disrupt the normal neurological control of the detrusor muscle, leading to instability. Although age-related changes and other conditions like autonomic dysfunction or diabetes may also contribute to bladder issues, they do not specifically describe the classic syndrome associated with normal-pressure hydrocephalus. The unique interplay of symptoms that includes both cognitive and balance disturbances, alongside urinary issues, strongly points to normal-pressure hydrocephalus as the underlying cause of detrusor instability in this scenario.

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7. What should be the immediate next step if an elderly patient shows signs of self-neglect and poses a potential danger?

A. Conduct a psychiatric evaluation

B. Contact adult protective services

C. Administer emergency medication

D. Schedule follow-up visits

When an elderly patient exhibits signs of self-neglect and poses a potential danger to themselves, the most appropriate immediate step is to contact adult protective services. This action is crucial because adult protective services are specifically equipped to handle situations involving at-risk individuals who may be unable to care for themselves or may be facing neglect or abuse. In cases of self-neglect, where the elderly individual may not be able to make safe choices regarding their living conditions or health care, involving adult protective services can initiate an evaluation of the situation and provide necessary interventions. They can offer resources, assess the individual's living conditions, and help ensure that the elder receives the appropriate care and support to keep them safe. Other options, although potentially relevant in different contexts, do not address the urgent need for intervention as effectively. For example, conducting a psychiatric evaluation might be necessary to assess the mental health status of the patient, but it does not provide immediate assistance or ensure safety. Administering emergency medication could be relevant if there's an acute psychiatric emergency, but it does not address the underlying issue of self-neglect. Scheduling follow-up visits might be part of a longer-term care plan but does not serve to protect the patient in the immediate situation where danger is present.

8. A 42-year-old woman describes her hand tremor that worsens with movement. What disorder does this likely represent?

A. Parkinson's disease

B. Essential tremor

C. Cerebellar tremor

D. Dystonic tremor

The description of a hand tremor that worsens with movement aligns closely with essential tremor. Essential tremor is characterized by an action tremor, which means it typically becomes more pronounced during intentional movements such as holding a cup or writing. This condition often affects the hands, and the tremor can sometimes be observed in the head or voice as well. Essential tremor is a common movement disorder that usually occurs in a progressive manner, and it may have a hereditary component. Unlike tremors seen in other conditions, such as Parkinson's disease which typically presents with a resting tremor, essential tremor occurs more prominently when the patient is engaged in voluntary activity. In the context of the other disorders, Parkinson's disease is primarily characterized by resting tremors and does not worsen significantly with movement. A cerebellar tremor is typically associated with ataxia and is present during purposeful movements, but it has a different characteristic regarding its nature and context. Dystonic tremors often occur along with muscle contractions and abnormal postures, rather than isolated tremors that worsen strictly with movement. Given these characteristics, the hand tremor described in the scenario fits well with the features of essential tremor.

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9. What is the most likely diagnosis for a 32-year-old woman with a family history of tremors and symptoms worsened by emotional stress?

A. Huntington's disease

B. Essential tremor

C. Parkinson's disease

D. Multiple sclerosis

The most likely diagnosis in this scenario is essential tremor, particularly given the age of the patient and the family history of tremors. Essential tremor is characterized by a postural or action tremor that often becomes more pronounced during periods of emotional stress or when the affected individual is performing specific tasks. The familial component supports the diagnosis as essential tremor frequently has a genetic predisposition, presenting in multiple family members. While Huntington's disease could be considered due to its hereditary nature and movement abnormalities, it typically presents with other neurologic features such as chorea and cognitive decline, which are not indicated here. Parkinson's disease usually emerges later in life and is marked by rigidity, bradykinesia, and resting tremor, none of which are suggested by the information provided. Multiple sclerosis is a demyelinating condition that can cause various neurological symptoms but is less likely to present primarily with tremors as a prominent feature, especially without other signs such as visual disturbances or motor weakness. Therefore, the clinical picture aligns most closely with essential tremor as the correct diagnosis.

10. What is a common finding in patients diagnosed with restless legs syndrome (RLS)?

A. Abnormal electrical impulse conduction study

B. Increased muscle strength

C. Normal electromyography results

D. Consistent pain relief with rest

In patients with restless legs syndrome (RLS), a common finding is the presence of normal electromyography (EMG) results. Electromyography is often performed to assess muscle activity and can rule out other neuromuscular disorders. In the context of RLS, patients typically do not show any significant findings on EMG, which reflects normal muscle function. RLS is characterized by an uncontrollable urge to move the legs, often accompanied by uncomfortable sensations. These symptoms typically worsen during periods of inactivity or when resting and improve with movement. The condition is related to a dysfunction in the dopaminergic pathways and may also have a genetic component, rather than being associated with abnormalities in electrical conduction or increased muscle strength. The other findings mentioned, such as abnormal electrical impulse conduction or consistent pain relief with rest, are not characteristic of RLS. In fact, individuals with RLS often experience worsening symptoms during rest and may find temporary relief through movement, which contradicts the notion of having consistent pain relief while resting.

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