ABRET Electroencephalography (EEG) Practice Test (Sample)

Study Guide

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Questions

1. **What condition occurs only in females and is characterized by normal development until 6 to 18 months of age, followed by a decline in mental abilities?**
   - **A. Rett syndrome**
   - **B. Autism spectrum disorder**
   - **C. Attention deficit hyperactivity disorder**
   - **D. Cerebral palsy**

2. **What type of seizures are most common in children and are often associated with fevers?**
   - **A. Absence seizures**
   - **B. Febrile seizures**
   - **C. Complex partial seizures**
   - **D. Tonic-clonic seizures**

3. **Who should EEG findings be discussed with according to best practices?**
   - **A. The interpreting electroencephalographer**
   - **B. The patient's primary care physician**
   - **C. Other technologists for collaboration**
   - **D. Family members of the patient**

4. **What clinical sign is commonly associated with the middle cerebral artery stroke?**
   - **A. Weakness in the legs**
   - **B. Contralateral arm weakness**
   - **C. Difficulty speaking**
   - **D. Visual disturbances**

5. **Bilateral anterior beta activity is most likely to occur with which medication?**
   - **A. Lithium**
   - **B. Diazepam**
   - **C. Carbamazepine**
   - **D. Topiramate**

6. Which term describes a blood clot formed at the site of an atherosclerotic plaque?

A. Embolus

B. Thrombus

C. Coagulum

D. Hemorrhage

7. What is typically characterized by burst-suppression in an EEG pattern?

A. Light sedation

B. Deep anesthesia

C. Comatose state

D. Awake and alert state

8. When testing an outpatient with active tuberculosis, what is essential for the patient to wear?

A. A surgical gown

B. A mask

C. Protective eyewear

D. Gloves

9. Which drug is indicated for treating absence seizures?

A. Carbamazepine

B. Valproic acid

C. Topiramate

D. Phenytoin

10. Which electrode might best demonstrate EEG activity associated with focal motor twitching of the right corner of the mouth?

A. C3

B. C5

C. F4

D. P3

Answers

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

Explanations

1. What condition occurs only in females and is characterized by normal development until 6 to 18 months of age, followed by a decline in mental abilities?

A. Rett syndrome

B. Autism spectrum disorder

C. Attention deficit hyperactivity disorder

D. Cerebral palsy

Rett syndrome is a neurodevelopmental disorder that predominantly affects females and is characterized by normal early growth and development for the first six to eighteen months of life. Following this period, individuals with Rett syndrome typically experience a significant regression in cognitive and motor skills. This regression often includes a loss of purposeful hand skills, social engagement, and speech abilities, while also presenting with repetitive hand movements, gait abnormalities, and seizures. The unique aspect of Rett syndrome is its almost exclusive occurrence in females, attributed to its association with mutations in the MECP2 gene located on the X chromosome. Males who inherit similar mutations often do not survive to birth or exhibit severe forms of the condition that are incompatible with life, making Rett syndrome a condition that clearly differentiates itself from the other options listed, which can affect both genders and often do not follow the same pattern of development and regression. Understanding these characteristics helps clarify why Rett syndrome is the only condition among the options presented that fits the specified criteria of being exclusive to females and exhibiting a specific timeline of normal development followed by a decline in mental abilities.

2. What type of seizures are most common in children and are often associated with fevers?

A. Absence seizures

B. Febrile seizures

C. Complex partial seizures

D. Tonic-clonic seizures

Febrile seizures are the type most commonly observed in children, particularly in those aged between 6 months and 5 years. These seizures occur in response to a rapid increase in body temperature, often resulting from infections such as viral illnesses. Unlike other types of seizures, febrile seizures are specifically linked to fever and happen when the temperature rises above a certain threshold, typically around 101-102°F (38.3-38.9°C). These seizures are generally brief and do not usually lead to long-term complications or an increased risk of epilepsy later in life. The condition distinguishes itself from other seizure types, as it is specifically triggered by fever rather than being due to underlying neurological conditions. This aspect makes febrile seizures a unique phenomenon among childhood seizures, reinforcing the importance of recognizing their characteristics and clinical context.

3. Who should EEG findings be discussed with according to best practices?

A. The interpreting electroencephalographer

B. The patient's primary care physician

C. Other technologists for collaboration

D. Family members of the patient

The best practice in discussing EEG findings is to communicate directly with the interpreting electroencephalographer. This individual has the expertise and training necessary to accurately interpret the data from the EEG. They possess in-depth knowledge of the patient's history, clinical presentation, and the specific nuances of EEG patterns which are essential for forming a comprehensive clinical picture. Engaging with the interpreting electroencephalographer ensures that the findings are assessed within the correct clinical context and that any conclusions drawn are based on informed interpretations of the data. This collaboration can lead to a more effective management plan for the patient, as the electroencephalographer can provide insights and recommendations based on their specialized knowledge. While discussing findings with the patient's primary care physician, other technologists, or family members can be valuable for different reasons, it is crucial that the initial and primary discussion occurs with the interpreting electroencephalographer to ensure that the information shared is grounded in professional expertise and clinical relevance.

4. What clinical sign is commonly associated with the middle cerebral artery stroke?

A. Weakness in the legs

B. Contralateral arm weakness

C. Difficulty speaking

D. Visual disturbances

The presence of contralateral arm weakness is a highly recognized clinical sign associated with a middle cerebral artery (MCA) stroke. This type of stroke commonly affects the lateral aspect of the cerebral hemispheres, particularly the regions responsible for motor control of the arm and face, which are located in the precentral gyrus (primary motor cortex). When an MCA stroke occurs, it typically results in motor deficits that impact the arm more significantly than the leg. Consequently, a patient may demonstrate weakness on the side of the body opposite to where the stroke has occurred (contralateral). Since the arm and hand representation is more laterally located in the motor cortex, weakness in these regions tends to be more pronounced than in the legs, which are more medially represented. This understanding of the anatomy and function of the brain is crucial for accurately identifying the symptoms of a stroke in clinical practice. The focus on arm weakness highlights the preferential impact of the MCA infarction on the motor functions governing the upper limbs.

5. Bilateral anterior beta activity is most likely to occur with which medication?

A. Lithium

B. Diazepam

C. Carbamazepine

D. Topiramate

Bilateral anterior beta activity is notably associated with Diazepam, a benzodiazepine medication. Diazepam enhances the effect of the neurotransmitter GABA at the GABA-A receptor, which can lead to increased beta activity in the EEG. This kind of brain wave pattern is often seen in states of relaxation or sedation, which are common effects of benzodiazepines like Diazepam. The presence of increased beta activity over the anterior regions of the scalp following administration of Diazepam can indicate its calming and muscle-relaxing properties. Beta activity is typically linked to alertness and active concentration, but in this context, the observation of bilateral anterior beta activity points to the specific influence of the drug on brain function, particularly relating to enhanced GABAergic activity. In contrast, other medications listed have different effects on EEG patterns. For example, lithium is primarily associated with stabilizing mood and does not have as direct an impact on beta activity. Carbamazepine and topiramate, while also anticonvulsants, are more associated with promoting slowing of the background rhythms on an EEG rather than enhancing beta activity. Thus, Diazepam stands out as the medication most likely to induce the specific pattern of bilateral anterior beta activity.

6. Which term describes a blood clot formed at the site of an atherosclerotic plaque?

A. Embolus

B. Thrombus

C. Coagulum

D. Hemorrhage

The term that describes a blood clot formed at the site of an atherosclerotic plaque is "thrombus." When atherosclerosis occurs, fatty deposits build up in the arteries, potentially forming plaques that can rupture. When this happens, the body's natural response is to form a clot at the site of the rupture to stop any bleeding and seal the area. This clot is specifically termed a thrombus, as it is attached to the site where it formed. In contrast, an embolus refers to a clot that has broken loose and travels through the bloodstream to another location, while a coagulum is a more general term for any mass formed by the coagulation of blood, not necessarily confined to a specific site like a thrombus. Hemorrhage, on the other hand, refers to bleeding, which is the opposite of what occurs when a thrombus is formed. Therefore, "thrombus" accurately describes the situation where a clot forms directly in response to an atherosclerotic plaque.

7. What is typically characterized by burst-suppression in an EEG pattern?

A. Light sedation

B. Deep anesthesia

C. Comatose state

D. Awake and alert state

Burst-suppression is a specific EEG pattern that is often seen in the context of deep anesthesia. This pattern is characterized by periods of high-amplitude bursts of brain activity followed by periods of suppression or almost complete electrical inactivity. In deep anesthesia, the brain shows this type of activity as a result of the profound effects anesthetic agents have on neuronal excitability and connectivity. Administered anesthetics induce a state of reduced responsiveness to external stimuli, leading to the burst-suppression pattern. This signifies a significant alteration in brain function, which contrasts with lighter states of sedation or being awake, where more continuous activity or rhythmic patterns are typically present. In a comatose state, although it might also show burst-suppression, the context usually relates more closely to an underlying pathology or injury rather than a controlled anesthetic state. Therefore, understanding the relationship between EEG patterns and different states of consciousness highlights why burst-suppression is most typically associated with deep anesthesia.

8. When testing an outpatient with active tuberculosis, what is essential for the patient to wear?

A. A surgical gown

B. A mask

C. Protective eyewear

D. Gloves

In the context of an outpatient with active tuberculosis, it is essential for the patient to wear a mask to help prevent the spread of the disease. Tuberculosis is an airborne infection that can be transmitted through respiratory droplets when an infected person coughs or sneezes. The mask serves as a crucial barrier to contain these droplets and minimize the risk of transmission to healthcare workers and other individuals in the vicinity. While surgical gowns, protective eyewear, and gloves may be important in certain medical procedures or with other types of infections, they do not specifically address the airborne transmission of tuberculosis. The focus with TB cases prioritizes the use of masks to limit the potential for spreading the infection, making it the most critical protective measure in this situation.

9. Which drug is indicated for treating absence seizures?

A. Carbamazepine

B. Valproic acid

C. Topiramate

D. Phenytoin

Valproic acid is indicated for treating absence seizures primarily due to its effectiveness in controlling this type of seizure activity. Absence seizures are characterized by brief lapses in consciousness, and valproic acid helps to stabilize neuronal membranes and inhibit excessive neuronal firing. This anticonvulsant medication works by increasing the levels of gamma-aminobutyric acid (GABA), an inhibitory neurotransmitter in the brain, which can help reduce the frequency and severity of seizures. While other medications may be used to manage various types of seizures, they are not typically the first line of treatment for absence seizures. For example, carbamazepine is more effective for focal and generalized tonic-clonic seizures but can potentially worsen absence seizures. Topiramate is also used for several seizure types but is not specifically indicated for absence seizures. Phenytoin is effective for tonic-clonic seizures but does not have efficacy for absence seizures and may also have adverse effects on this condition. Therefore, valproic acid remains the preferred choice for effectively managing absence seizures.

10. Which electrode might best demonstrate EEG activity associated with focal motor twitching of the right corner of the mouth?

A. C3

B. C5

C. F4

D. P3

The electrode that is most appropriate for demonstrating EEG activity associated with focal motor twitching of the right corner of the mouth is located in the region of the brain that controls motor function for the face. The sensorimotor cortex, which includes the primary motor cortex responsible for voluntary movements, is organized in a way that specific areas correspond to movements of different body parts. The area that controls the mouth and facial movements is located in the lateral aspect of the motor cortex, generally near the central sulcus. For twitching occurring in the right corner of the mouth, the appropriate electrode should be placed over the left hemisphere of the brain, since motor control is contralateral. The chosen option, with its placement, effectively captures signals from the left motor cortex, which governs motions of the right side of the face, including the mouth. This makes it the most relevant choice for detecting the EEG activity associated with focal movements like twitching. Examining the other options helps contextualize this choice. C3 and P3 correspond to other areas of the brain that would not be specifically focused on the mouth region. C5 is not typically used in standard EEG montages and is likely to be less effective for this specific function. Meanwhile, F4 is situated over