NBEO Systemic Disease Practice Exam (Sample)

Study Guide

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Questions

1. What is the normal ESR level for a 70-year-old female presenting with symptoms of GCA?

A. 35 mm/hr

B. 40 mm/hr

C. 45 mm/hr

D. 50 mm/hr

2. Which of the following is a hallmark of liquefactive necrosis?

A. Formation of pus

B. Cheesy consistency of tissue

C. Hardening of affected tissues

D. Increased blood flow to the area

3. Which of the following is a common cause of retinal detachment?

A. Tears in the retinal membrane

B. Increased intraocular pressure

C. Systemic hypertension

D. Uveitis

4. What are the two main treatment options for Gonorrhea?

A. Ceftriaxone IM and Doxycycline

B. Azithromycin and Metronidazole

C. Trimethoprim and Erythromycin

D. IV Penicillin and Tetracycline

5. Which type of leukemia is primarily associated with the Philadelphia chromosome?

A. Acute Lymphoblastic Leukemia (ALL)

B. Chronic Myelocytic Leukemia (CML)

C. Acute Myeloid Leukemia (AML)

D. Chronic Lymphocytic Leukemia (CLL)

6. What is NOT part of the classic triad of Neurofibromatosis type 1?

A. Cafe au lait spots

B. Neurofibromas

C. Acoustic neuroma

D. Lisch nodules on the iris

7. Which term describes the condition of fluid accumulation due to sodium retention?

A. Edema

B. Puffiness

C. Congestion

D. Formication

8. What are the four main types of necrosis?

A. Coagulative, liquefactive, caseous, fat

B. Necrotizing, coagulative, liquefactive, caseous

C. Coagulative, caseous, apopototic, fat

D. Liquid, coagulative, necrotizing, caseous

9. Which type of headaches are known to wake a person from sleep?

A. Migraine headaches

B. Tension headaches

C. Cluster headaches

D. Brain tumor headaches

10. Which of the following hypersensitivity reactions is considered cytotoxic in nature?

A. Type 1

B. Type 2

C. Type 3

D. Type 4

Answers

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

Explanations

1. What is the normal ESR level for a 70-year-old female presenting with symptoms of GCA?

A. 35 mm/hr

B. 40 mm/hr

C. 45 mm/hr

D. 50 mm/hr

The normal erythrocyte sedimentation rate (ESR) can vary based on several factors, including age and sex. For older adults, particularly women over 50, the normal range tends to be higher than that for younger individuals. Typically, the ESR can be considered elevated in the context of systemic inflammatory conditions and is often used to help diagnose conditions such as giant cell arteritis (GCA). In the case of a 70-year-old female presenting with symptoms of GCA, an ESR of 40 mm/hr reflects a level that is elevated, indicating a likely inflammatory process associated with her symptoms. In women of this age, elevated ESR values suggest the presence of inflammation, and values above 20 mm/hr are often interpreted as significant in the context of clinical concerns for conditions like GCA. While all the values provided are elevated, the selection of 40 mm/hr aligns with the typical response seen in GCA and provides a reasonable threshold for clinical interpretation in the assessment of systemic inflammatory diseases. It is important to note that while a higher ESR indicates increased inflammation, the focus should remain on the clinical picture and risk factors when evaluating the patient further.

2. Which of the following is a hallmark of liquefactive necrosis?

A. Formation of pus

B. Cheesy consistency of tissue

C. Hardening of affected tissues

D. Increased blood flow to the area

Liquefactive necrosis is characterized by the transformation of tissue into a liquid viscous mass, often resulting in the formation of pus. This type of necrosis occurs when there is a high presence of inflammatory cells, particularly neutrophils, which release enzymes that degrade cellular structures. The liquefaction essentially occurs as a response to infection, especially with bacteria that cause significant tissue destruction, leading to the accumulation of dead cells, bacteria, and liquefied tissue debris, which is collectively recognized as pus. In contrast, other forms of necrosis are associated with different characteristics. For instance, caseous necrosis, which resembles a "cheesy" consistency due to the accumulation of necrotic material, typically occurs with tuberculosis. The hardening of affected tissues is more indicative of coagulative necrosis, frequently seen in myocardial infarction. Increased blood flow is associated with inflammatory responses but does not specifically relate to the defining feature of liquefactive necrosis. Hence, the hallmark feature of liquefactive necrosis is indeed the formation of pus.

3. Which of the following is a common cause of retinal detachment?

A. Tears in the retinal membrane

B. Increased intraocular pressure

C. Systemic hypertension

D. Uveitis

A common cause of retinal detachment is tears in the retinal membrane. This condition occurs when the retina, which is the light-sensitive tissue at the back of the eye, becomes separated from its underlying supportive tissue. When there are tears, fluids can seep through these openings, leading to the detachment. This type of retinal detachment is often referred to as a rhegmatogenous detachment, and it is the most prevalent form. Factors that contribute to the formation of these tears include age-related changes in the vitreous gel, trauma, or even myopia. Recognizing the link between retinal tears and detachment is crucial for timely intervention to prevent vision loss. In contrast, while increased intraocular pressure and systemic hypertension can lead to other eye conditions such as glaucoma or hypertensive retinopathy, they are not direct causes of retinal detachment. Uveitis, being an inflammatory condition of the uveal tract, can also lead to various complications within the eye but is not typically a primary cause of retinal detachment. Thus, tears in the retinal membrane are the most relevant and direct cause in the context of this question.

4. What are the two main treatment options for Gonorrhea?

A. Ceftriaxone IM and Doxycycline

B. Azithromycin and Metronidazole

C. Trimethoprim and Erythromycin

D. IV Penicillin and Tetracycline

The correct treatment options for gonorrhea are ceftriaxone and doxycycline. Ceftriaxone, a cephalosporin antibiotic, is the first-line treatment for gonorrhea due to its effectiveness against Neisseria gonorrhoeae, the bacteria responsible for the infection. Doxycycline, a tetracycline antibiotic, may be used in conjunction with ceftriaxone to help cover potential co-infection with Chlamydia trachomatis, as both infections can occur simultaneously. This dual therapy approach helps to ensure comprehensive treatment and reduces the risk of treatment failure. While other options like azithromycin and metronidazole may be effective in treating different infections, they are not standard treatments for gonorrhea. Azithromycin has been used in the past for gonorrhea treatment but is outdated due to increasing resistance. Metronidazole primarily treats anaerobic infections and is not indicated for gonorrhea. The other options, including trimethoprim and erythromycin, as well as IV penicillin and tetracycline, lack efficacy against gonorrhea and are not recommended in current guidelines. Thus, ceftriaxone and doxycycline remain the preferred treatment for this sexually transmitted infection.

5. Which type of leukemia is primarily associated with the Philadelphia chromosome?

A. Acute Lymphoblastic Leukemia (ALL)

B. Chronic Myelocytic Leukemia (CML)

C. Acute Myeloid Leukemia (AML)

D. Chronic Lymphocytic Leukemia (CLL)

Chronic Myelocytic Leukemia (CML) is primarily associated with the Philadelphia chromosome, which is a specific genetic abnormality resulting from a translocation between chromosomes 9 and 22. This genetic alteration leads to the formation of the BCR-ABL fusion protein, which has tyrosine kinase activity that promotes cell proliferation and inhibits apoptosis, resulting in the excessive accumulation of myeloid cells in the bone marrow and peripheral blood. CML typically progresses through phases, starting with a chronic phase where patients may be asymptomatic and later advancing to an accelerated phase and then to a blast crisis. The presence of the Philadelphia chromosome is a hallmark of CML and is critical for diagnosis and monitoring the disease, as it also helps guide treatment options including targeted therapies such as tyrosine kinase inhibitors. While other leukemias may have unique genetic abnormalities, none are as closely associated with the Philadelphia chromosome as CML. Other types of leukemia mentioned do not share this specific chromosomal alteration as a defining feature.

6. What is NOT part of the classic triad of Neurofibromatosis type 1?

A. Cafe au lait spots

B. Neurofibromas

C. Acoustic neuroma

D. Lisch nodules on the iris

Neurofibromatosis type 1 (NF1) is characterized by a classic triad of findings that include café au lait spots, neurofibromas, and Lisch nodules. Café au lait spots are flat, tan-colored skin lesions that are typically present at birth or develop during early childhood. Neurofibromas are benign tumors that arise from the nerve sheath and often appear later in life, commonly manifesting as soft, fleshy growths that can occur anywhere on the body. Lisch nodules are harmless hamartomas of the iris that become apparent during childhood and are a distinct and helpful diagnostic criterion for NF1. Acoustic neuroma, on the other hand, is associated with Neurofibromatosis type 2 (NF2) rather than NF1. NF2 primarily involves bilateral vestibular schwannomas (often referred to as acoustic neuromas), which affect hearing and balance. Therefore, acoustic neuroma does not fit within the classic triad of NF1 findings, distinguishing it clearly from the other listed features that are typical in NF1.

7. Which term describes the condition of fluid accumulation due to sodium retention?

A. Edema

B. Puffiness

C. Congestion

D. Formication

The term that best describes the condition of fluid accumulation due to sodium retention is edema. Edema refers specifically to the excessive accumulation of fluid in the interstitial spaces and within various tissues throughout the body. This condition often occurs when the body retains sodium, leading to increased water retention as a weight-compensating mechanism. In cases of fluid overload, whether due to dietary sodium intake, heart failure, or other underlying conditions, edema can manifest in different areas, including the limbs, abdomen, or around the eyes. In contrast, while puffiness can be a descriptive term for localized edema—commonly seen in the face or extremities—it is not a precise medical term and does not encompass the full clinical implications of fluid accumulation. Congestion typically refers to an excess of blood in a given area, often due to impaired venous return, rather than the accumulation of fluid due to sodium retention. Formication describes a sensation of insects crawling on or under the skin and is unrelated to fluid accumulation. Thus, edema is the most appropriate and clinically relevant term in this context.

8. What are the four main types of necrosis?

A. Coagulative, liquefactive, caseous, fat

B. Necrotizing, coagulative, liquefactive, caseous

C. Coagulative, caseous, apopototic, fat

D. Liquid, coagulative, necrotizing, caseous

The four main types of necrosis are coagulative, liquefactive, caseous, and fat necrosis. Coagulative necrosis is typically associated with ischemic events that cause cell death while preserving the basic tissue architecture. This type is commonly observed in heart attacks and occurs due to the denaturation of proteins and enzymes. Liquefactive necrosis leads to the transformation of tissue into a liquid viscous mass, primarily seen in brain injuries or infections where enzymatic breakdown occurs rapidly. This type is characterized by the accumulation of pus and is common in bacterial infections. Caseous necrosis is often linked to tuberculosis infections, where the affected tissue appears cheese-like or caseous due to the presence of necrotic tissue surrounded by inflammation. This specific appearance is due to the immune response to mycobacterial infection. Fat necrosis occurs when there is damage to adipose tissue, commonly associated with pancreatitis or trauma. It involves the formation of fatty acids that bind with calcium, leading to necrosis in the fatty tissues. Collectively, these four types of necrosis cover the principal mechanisms of cell death and tissue reaction to injury, making answer A the correct choice.

9. Which type of headaches are known to wake a person from sleep?

A. Migraine headaches

B. Tension headaches

C. Cluster headaches

D. Brain tumor headaches

Headaches that wake a person from sleep are often indicative of an underlying condition, and brain tumor headaches are particularly notable in this regard. These headaches can occur due to increased intracranial pressure or other changes in the brain associated with tumors. As the pressure inside the skull builds up, it can lead to discomfort or pain that disrupts sleep, typically occurring in the early morning or at night. In contrast, migraines may also occur at night, but they do not consistently wake individuals from sleep. Rather, they can be triggered by numerous factors. Tension headaches generally have a pattern associated with stress and muscle tension, not typically associated with waking someone from sleep. Cluster headaches, while extremely painful and occurring in cyclical patterns, usually do not specifically disrupt sleep as a primary symptom like those attributed to brain tumors. In summary, when considering headaches that distinctly awaken a person from their slumber, brain tumor-related headaches stand out due to their association with increased intracranial pressure and the nature of the headaches' onset correlating with sleep disruption.

10. Which of the following hypersensitivity reactions is considered cytotoxic in nature?

A. Type 1

B. Type 2

C. Type 3

D. Type 4

Type 2 hypersensitivity reactions are characterized by cytotoxic mechanisms where antibodies target specific cells or tissues, leading to cell destruction. In this type of hypersensitivity, immunoglobulin G (IgG) or immunoglobulin M (IgM) antibodies bind to antigens on the surface of target cells. This binding activates the complement system, which facilitates the destruction of the target cells through various mechanisms, including opsonization and cell lysis. This process can occur in several clinical scenarios, including autoimmune hemolytic anemia, where antibodies target red blood cells, and in conditions like Graves' disease, where antibodies stimulate thyroid cells, leading to various systemic effects. The cytotoxic nature of Type 2 hypersensitivity distinguishes it from other hypersensitivity types, as it directly leads to tissue damage through complement activation and antibody-mediated cellular destruction.