Pharmacology Assessment A & B Practice Exam (Sample)

Study Guide

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Questions

1. What is the mechanism of action of proton pump inhibitors?

A. Inhibiting calcium entry into cells

B. Blocking the proton pump in gastric parietal cells

C. Promoting the release of insulin

D. Relaxing bronchial smooth muscle

2. What are some common side effects of corticosteroids?

A. Weight loss and decreased blood sugar

B. Increased appetite and skin rash

C. Weight gain and immune suppression

D. Headaches and dizziness

3. Which instruction should a nurse provide for a client prescribed allopurinol?

A. Plan to increase the dosage each week by 200mg increments

B. Prolonged use of the medication can cause glaucoma

C. Drink 2L of water daily

D. A fine red rash is transient and can be treated with antihistamines

4. Which of the following is an example of a drug that inhibits enzymes?

A. Ibuprofen

B. Asprin

C. Acetaminophen

D. Corticosteroids

5. When caring for a client receiving mannitol via IV infusion, which adverse effect should the nurse monitor for?

A. Weight loss

B. Increased intraocular pressure

C. Auditory hallucinations

D. Bibasilar crackles

6. Which medication is often prescribed to treat GERD?

- **A. Metformin**
- **B. Omeprazole**
- **C. Atorvastatin**
- **D. Furosemide**

7. What potential toxicity can occur with aminoglycoside antibiotics?

- **A. Nephrotoxicity and ototoxicity**
- **B. Gastrotoxicity and hepatotoxicity**
- **C. Cytotoxicity and dermal toxicity**
- **D. Neurological and cardiovascular toxicity**

8. Which adverse effect of gentamicin should the nurse report to the provider?

- **A. Constipation**
- **B. Tinnitus**
- **C. Hypoglycemia**
- **D. Joint pain**

9. Which is a main benefit of using inhalers for asthma?

- **A. They are fast acting.**
- **B. They are inexpensive.**
- **C. They can be administered at any time.**
- **D. They have no side effects.**

10. Which class of antibiotics is primarily effective against Gram-positive infections?

- **A. Macrolides**
- **B. Tetracyclines**
- **C. Penicillins**
- **D. Aminoglycosides**

Answers

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

Explanations

1. What is the mechanism of action of proton pump inhibitors?

A. Inhibiting calcium entry into cells

B. Blocking the proton pump in gastric parietal cells

C. Promoting the release of insulin

D. Relaxing bronchial smooth muscle

Proton pump inhibitors (PPIs) function primarily by blocking the proton pump, which is the H+/K+ ATPase enzyme located in the gastric parietal cells of the stomach lining. This proton pump is responsible for the secretion of hydrogen ions (protons) into the gastric lumen, which ultimately contributes to the production of gastric acid. By inhibiting this pump, PPIs effectively reduce the production of gastric acid, leading to an increase in gastric pH. This mechanism is beneficial for treating conditions such as gastroesophageal reflux disease (GERD), peptic ulcers, and Zollinger-Ellison syndrome, where excessive acid secretion is problematic. The other options do not describe the mechanism of action for PPIs. Inhibiting calcium entry into cells relates to calcium channel blockers, promoting insulin release pertains to certain diabetes medications, and relaxing bronchial smooth muscle is characteristic of bronchodilators used for asthma or COPD. Understanding the specific action of PPIs helps clarify their role in managing acid-related disorders.

2. What are some common side effects of corticosteroids?

A. Weight loss and decreased blood sugar

B. Increased appetite and skin rash

C. Weight gain and immune suppression

D. Headaches and dizziness

Corticosteroids are synthetic drugs that closely resemble cortisol, a hormone that your body produces naturally. They are commonly used to reduce inflammation and suppress the immune system in various conditions, including autoimmune diseases, allergies, and certain inflammatory conditions. Weight gain is a well-documented side effect of corticosteroids due to increased appetite and changes in metabolism. These medications can also cause fluid retention, leading to additional weight gain. Immune suppression occurs because corticosteroids can interfere with the immune response, making individuals more susceptible to infections. This side effect is particularly relevant in the context of treating conditions such as asthma, rheumatoid arthritis, or after organ transplants, where controlling the immune response is necessary. In contrast, weight loss and decreased blood sugar are not typical side effects; rather, corticosteroids can lead to increased blood sugar levels, which can complicate diabetes management. While some patients might experience skin changes or rashes, increased appetite, fluid retention, mood swings, and immune system alteration are more characteristic of corticosteroid use, solidifying why the selection indicating weight gain and immune suppression is accurate.

3. Which instruction should a nurse provide for a client prescribed allopurinol?

A. Plan to increase the dosage each week by 200mg increments

B. Prolonged use of the medication can cause glaucoma

C. Drink 2L of water daily

D. A fine red rash is transient and can be treated with antihistamines

The appropriate instruction for a client prescribed allopurinol is to drink 2 liters of water daily. This recommendation is crucial because allopurinol is commonly used to manage conditions like gout by reducing uric acid levels in the blood. Increasing fluid intake helps to facilitate the excretion of uric acid through the kidneys, reducing the risk of kidney stones and supporting overall urinary health. Staying well-hydrated is essential when taking allopurinol, as it minimizes potential side effects and enhances the drug's effectiveness in preventing acute gout attacks. Other options do not accurately reflect appropriate instructions for allopurinol. For instance, increasing the dosage weekly by 200mg could lead to adverse effects; dose adjustments should be made under the guidance of a healthcare provider, typically based on uric acid levels and response to treatment. The claim regarding glaucoma also lacks a direct association with allopurinol, as prolonged use is not known to cause this condition. Lastly, while a fine red rash can occur in some patients, it may indicate a more serious reaction, and treating it merely with antihistamines might not be sufficient without further medical evaluation.

4. Which of the following is an example of a drug that inhibits enzymes?

A. Ibuprofen

B. Asprin

C. Acetaminophen

D. Corticosteroids

Aspirin is an example of a drug that inhibits enzymes because it functions as a nonsteroidal anti-inflammatory drug (NSAID) that irreversibly inhibits cyclooxygenase (COX) enzymes. These enzymes are crucial in the conversion of arachidonic acid to prostaglandins and thromboxanes, which play significant roles in inflammation, pain, and platelet aggregation. By inhibiting COX, aspirin effectively reduces the production of these mediators, leading to its therapeutic effects, such as pain relief and anti-inflammatory action. This mechanism highlights how certain drugs can target and modulate specific enzyme activity to exert their pharmacological effects. Other options, while important medications, do not primarily act as enzyme inhibitors. For instance, ibuprofen also inhibits COX enzymes but does so reversibly, acetaminophen's action on COX is less understood and is not its primary mechanism, and corticosteroids mainly exert their effects by modifying gene expression and immune response rather than directly inhibiting enzymes.

5. When caring for a client receiving mannitol via IV infusion, which adverse effect should the nurse monitor for?

A. Weight loss

B. Increased intraocular pressure

C. Auditory hallucinations

D. Bibasilar crackles

Mannitol is an osmotic diuretic that is primarily used to reduce intracranial pressure and treat conditions such as cerebral edema and glaucoma. When administering mannitol, it is important to monitor for specific adverse effects related to its mechanism of action. One of the key adverse effects to monitor for when a client is receiving mannitol via IV infusion is the development of bibasilar crackles, which can indicate pulmonary edema. Mannitol causes an osmotic diuresis, leading to increased urine output. If the kidneys are unable to effectively eliminate the excess fluid and solutes, this can result in fluid overload. The pulmonary system may then exhibit signs of this overload, such as crackles upon auscultation, especially in the bases of the lungs. In contrast, weight loss is not typically an adverse effect associated with mannitol. Increased intraocular pressure is also contrary to the therapeutic intent of mannitol, which aims to reduce eye pressure. Auditory hallucinations are not directly related to mannitol use and are more indicative of a neurological or psychiatric issue rather than a common adverse effect of this medication. Understanding these specific effects helps guide appropriate monitoring and intervention for patients receiving mannitol.

6. Which medication is often prescribed to treat GERD?

A. Metformin

B. Omeprazole

C. Atorvastatin

D. Furosemide

Omeprazole is a medication that belongs to a class of drugs known as proton pump inhibitors (PPIs). It works by inhibiting the proton pump in the stomach lining, which decreases the production of stomach acid. This reduction in acid is beneficial for individuals suffering from gastroesophageal reflux disease (GERD), as it helps to relieve symptoms associated with the condition, such as heartburn and regurgitation. By lowering stomach acidity, omeprazole effectively heals the esophagus and prevents further damage caused by acid reflux. The other medications listed serve different purposes: Metformin is primarily used to manage blood sugar levels in patients with type 2 diabetes, atorvastatin is a cholesterol-lowering medication that works by inhibiting HMG-CoA reductase, and furosemide is a diuretic used to treat fluid retention and high blood pressure. Thus, omeprazole is specifically targeted for GERD treatment, making it the appropriate choice in this context.

7. What potential toxicity can occur with aminoglycoside antibiotics?

A. Nephrotoxicity and ototoxicity

B. Gastrotoxicity and hepatotoxicity

C. Cytotoxicity and dermal toxicity

D. Neurological and cardiovascular toxicity

Aminoglycoside antibiotics, which include drugs such as gentamicin, tobramycin, and amikacin, are known for their significant potential to cause nephrotoxicity and ototoxicity. Nephrotoxicity refers to damage to the kidneys, which is a critical concern with aminoglycosides. These drugs are excreted through the kidneys, and they can accumulate, leading to renal impairment. Monitoring kidney function is essential during treatment with these medications to prevent or catch any signs of toxicity early. Ototoxicity involves damage to the inner ear and can result in hearing loss, balance issues, or tinnitus (ringing in the ears). The risk of ototoxicity increases with the duration of therapy and higher cumulative doses of aminoglycosides, making it an important consideration when these agents are prescribed. This combination of nephrotoxicity and ototoxicity is a well-documented risk associated with the use of aminoglycosides, making this answer accurate. Other types of toxicities listed in the other options focus on different organ systems or mechanisms that are not typical side effects associated with aminoglycosides.

8. Which adverse effect of gentamicin should the nurse report to the provider?

A. Constipation

B. Tinnitus

C. Hypoglycemia

D. Joint pain

Gentamicin is an aminoglycoside antibiotic that is notable for its potential to cause ototoxicity, which can manifest as tinnitus, or ringing in the ears. This adverse effect is particularly significant because it may signal damage to the auditory system, which can lead to permanent hearing loss if not addressed promptly. Therefore, reporting tinnitus to the provider is critical for evaluating the patient's condition and potentially adjusting the medication regimen or implementing further monitoring to prevent irreversible effects. In contrast, while constipation, hypoglycemia, and joint pain may present their own concerns, they are not typically recognized as common or significant adverse effects associated with gentamicin therapy. Thus, they do not carry the same urgency for reporting in the context of gentamicin use.

9. Which is a main benefit of using inhalers for asthma?

A. They are fast acting.

B. They are inexpensive.

C. They can be administered at any time.

D. They have no side effects.

The main benefit of using inhalers for asthma is that they are fast acting. This rapid onset of action is crucial for asthma management, particularly during acute asthma attacks or exacerbations. Inhalers deliver medication directly to the lungs, where it can start working almost immediately. This is essential for relieving symptoms such as wheezing, shortness of breath, and chest tightness quickly, providing patients the necessary relief. Other aspects of inhalers, while beneficial, do not highlight the primary advantage as effectively. Although some inhalers can be relatively inexpensive and can often be used conveniently at any time, the immediacy of their effect is what makes them particularly valuable in urgent situations. Additionally, while inhalers can have fewer side effects compared to systemic medications, claiming that they have no side effects is inaccurate, as all medications can potentially cause adverse reactions. Thus, the fast-acting nature of inhalers remains their primary feature that directly impacts asthma management.

10. Which class of antibiotics is primarily effective against Gram-positive infections?

A. Macrolides

B. Tetracyclines

C. Penicillins

D. Aminoglycosides

The correct response is based on the effectiveness of the antibiotic class against Gram-positive bacteria. Penicillins are a subclass of beta-lactam antibiotics that target the synthesis of bacterial cell walls, a mechanism that is particularly effective against Gram-positive organisms. These bacteria typically have a thick peptidoglycan layer in their cell walls, making them vulnerable to the action of Penicillins, which disrupt this structure. While macrolides and tetracyclines can also be effective against certain Gram-positive infections, their spectrum of activity is broader, including some Gram-negative bacteria, which may make them less specific for Gram-positive infections. Aminoglycosides, on the other hand, are primarily effective against Gram-negative bacteria and have limited activity against Gram-positives, often requiring synergistic use with other antibiotics for efficacy against these types. Thus, among the options provided, Penicillins hold a prominent role in treating infections caused by Gram-positive bacteria due to their specific mode of action targeting the cell wall, making them the most appropriate choice in this context.