

QUESTION

1. A patient with a long history of chronic obstructive pulmonary disease (COPD) is admitted to the hospital with an acute exacerbation. The patient is currently on a long-term low-dose inhaled corticosteroid and a long-acting beta₂-agonist. The patient's current symptoms include increased sputum production, increased dyspnea, and a change in sputum color to yellow-green. The patient's vital signs are: temperature 38.0°C (100.4°F), heart rate 110 beats per minute, respiratory rate 22 breaths per minute, and oxygen saturation 90% on 2L of oxygen via nasal cannula. The patient's physical examination reveals hyperinflation of the chest, decreased breath sounds, and hyperresonance to percussion. The patient's arterial blood gas (ABG) shows: pH 7.35, PaCO₂ 45 mmHg, PaO₂ 60 mmHg, HCO₃⁻ 28 mEq/L, and bicarbonate 28 mEq/L. The patient's chest X-ray shows hyperinflation of the lungs and a flattened diaphragm. The patient's sputum culture is positive for *Pseudomonas aeruginosa*.

Question	Answer	Explanation
1. What is the most likely cause of the patient's acute exacerbation?	Infection with <i>Pseudomonas aeruginosa</i> .	The patient's symptoms, including increased sputum production, increased dyspnea, and a change in sputum color to yellow-green, are consistent with an acute exacerbation of COPD. The patient's sputum culture is positive for <i>Pseudomonas aeruginosa</i> , which is a common cause of acute exacerbation in patients with COPD.
2. What is the most appropriate initial management for the patient's acute exacerbation?	Systemic corticosteroids and a short-acting beta ₂ -agonist.	The patient's acute exacerbation is caused by infection with <i>Pseudomonas aeruginosa</i> . The most appropriate initial management is to start the patient on systemic corticosteroids and a short-acting beta ₂ -agonist. Systemic corticosteroids help to reduce airway inflammation and improve lung function. A short-acting beta ₂ -agonist provides rapid relief of bronchospasm.
3. What is the most appropriate antibiotic for the patient's acute exacerbation?	Intravenous piperacillin-tazobactam.	The patient's sputum culture is positive for <i>Pseudomonas aeruginosa</i> . The most appropriate antibiotic for the patient's acute exacerbation is intravenous piperacillin-tazobactam. Piperacillin-tazobactam is a broad-spectrum antibiotic that is effective against <i>Pseudomonas aeruginosa</i> .

2. A patient with a long history of chronic obstructive pulmonary disease (COPD) is admitted to the hospital with an acute exacerbation. The patient is currently on a long-term low-dose inhaled corticosteroid and a long-acting beta₂-agonist. The patient's current symptoms include increased sputum production, increased dyspnea, and a change in sputum color to yellow-green. The patient's vital signs are: temperature 38.0°C (100.4°F), heart rate 110 beats per minute, respiratory rate 22 breaths per minute, and oxygen saturation 90% on 2L of oxygen via nasal cannula. The patient's physical examination reveals hyperinflation of the chest, decreased breath sounds, and hyperresonance to percussion. The patient's arterial blood gas (ABG) shows: pH 7.35, PaCO₂ 45 mmHg, PaO₂ 60 mmHg, HCO₃⁻ 28 mEq/L, and bicarbonate 28 mEq/L. The patient's chest X-ray shows hyperinflation of the lungs and a flattened diaphragm. The patient's sputum culture is positive for *Pseudomonas aeruginosa*.

ANSWERS

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