

A 6-year-old girl is brought to the physician with a 10-day history of thick and persistent nasal discharge, nasal congestion, and cough. She has had no vomiting, headache, or earache. She has a history of intermittent asthma, and her medications include inhaled albuterol. Temperature is 37.2° C (98.9° F), blood pressure is 88/50 mm Hg, pulse is 90/min, and respirations are 15/min. Physical examination shows yellow, purulent mucus dripping from the posterior nasopharynx. Nasal turbinates are red and swollen. Maxillary sinuses are tender to palpation. Lung examination shows bilateral expiratory wheezes. Skin examination shows no abnormalities. Which of the following organisms is the most common cause of this condition?

- ☐ A. *Aspergillus fumigatus*
- ☐ B. *Streptococcus pneumoniae*
- ☐ C. *Pseudomonas aeruginosa*
- ☐ D. *Rhizopus arrhizus*
- ☐ E. *Staphylococcus aureus*
- ☐ F. *Moraxella catarrhalis*

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- ☐ A. *Aspergillus fumigatus* [2%]
- ☒ B. *Streptococcus pneumoniae* [68%]
- ☐ C. *Pseudomonas aeruginosa* [2%]
- ☐ D. *Rhizopus arrhizus* [3%]
- ☐ E. *Staphylococcus aureus* [12%]
- ☐ F. *Moraxella catarrhalis* [12%]

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Explanation:

User Id: **Diagnostic features of acute bacterial rhinosinusitis**

- *Persistent* symptoms ≥ 10 days without improvement
OR
- *Severe* symptoms, fever ≥ 39 C (102 F), purulent nasal discharge, or face pain ≥ 3 days
OR
- *Worsening* symptoms ≥ 5 days after initially improving viral upper respiratory infection

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The duration of this patient's symptoms is consistent with acute bacterial rhinosinusitis. *Streptococcus pneumoniae* (~30%), nontypeable *Haemophilus influenzae* (~30%), and *Moraxella catarrhalis* (~10%) (Choice E) are the most commonly implicated organisms.

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The duration of this patient's symptoms is consistent with acute bacterial rhinosinusitis. *Streptococcus pneumoniae* (~30%), nontypeable *Haemophilus influenzae* (~30%), and *Moraxella catarrhalis* (~10%) (**Choice F**) are the most commonly implicated organisms. Due to increasing rates of beta-lactamase resistance, the treatment of choice is amoxicillin-clavulanic acid. Patients with asthma may experience exacerbations (eg, wheezing, coughing) triggered by concurrent upper respiratory infection.

(Choices A and D) Although most cases of sinusitis are caused by bacteria, fungal pathogens can cause life-threatening sinusitis in patients with impaired host defenses (eg, poorly controlled diabetes mellitus, HIV). Alarming symptoms such as epistaxis, turbinate destruction, palatal eschars, and maxillary cyanosis should raise suspicion for fungal infection. This patient does not have these dangerous symptoms on examination, making fungal pathogens unlikely.

(Choice C) *Pseudomonas aeruginosa* is common in nosocomial sinusitis, especially in immunocompromised patients with nasal tubes or catheters. This patient does not have risk factors for *P. aeruginosa*.

(Choice E) *Staphylococcus aureus* may be seen in chronic sinusitis but is rarely a cause of acute bacterial rhinosinusitis in children. Chronic sinusitis is defined as inflammation of the sinuses for > 12 weeks, making *S. aureus* unlikely.

Educational objective:

Streptococcus pneumoniae and nontypeable *Haemophilus influenzae* are the most common causes of acute bacterial rhinosinusitis. Due to increasing beta-lactamase resistance, the treatment of choice is amoxicillin-clavulanic acid.

References:

1. [IDSA clinical practice guideline for acute bacterial rhinosinusitis in children and adults.](#)