OASIS DERMATOLOGY GROUP

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Cellulitis

Cellulitis is an acute, localized skin infection that primarily affects the deeper layers of the dermis and subcutaneous tissue. It is characterized by redness, warmth, swelling, and pain at the site of infection. The condition is most commonly caused by *Streptococcus pyogenes* (group A Streptococcus) and *Staphylococcus aureus* in adults, whereas in children under the age of 3 years, *Haemophilus influenzae* type B may be the causative agent.

Epidemiology and Etiology

Cellulitis is a common condition, with a higher incidence among individuals with predisposing factors such as compromised immune function, diabetes, or a history of skin trauma. In adults, the primary etiologic agents are *S. pyogenes* and *S. aureus*. In children under 3 years old, particularly those not yet vaccinated against *H. influenzae* type B, this bacterium may also be a significant cause of cellulitis.

Clinical Presentation and Diagnosis

The diagnosis of cellulitis is largely clinical, based on a combination of physical findings and patient history. The characteristic signs include redness and erythema at the site of infection, swelling and edema, warmth and localized pain or tenderness, and/or systemic symptoms such as fever may also be present, although they are not always observed.

The infection often arises in the presence of a preexisting skin lesion, such as a cut, abrasion, surgical wound, or insect bite, that provides an entry point for bacteria. The absence of these signs does not rule out cellulitis, particularly in the early stages of the infection.

While microbiological cultures are useful in specific cases, particularly with recurrent or complicated infections, they are typically not performed in the initial evaluation of most adults. In children under 3 years, identifying the causative organism may be more crucial due to the potential for *H. influenzae* type B involvement, which requires different therapeutic management.

Pathophysiology

The pathogenesis of cellulitis involves the entry of bacteria into the deeper layers of the skin through breaches in the epidermis, followed by bacterial multiplication and an inflammatory response. Both *S. pyogenes* and *S. aureus* are capable of producing various virulence factors, such as exotoxins and surface proteins, which enhance their ability to invade host tissues and evade immune defenses.

Empiric Treatment and Antibiotic Therapy

Empiric antibiotic therapy is typically initiated based on the most likely causative organisms, particularly in adults, where *S. pyogenes* and *S. aureus* are the most common pathogens. The choice of antibiotic is determined by the severity of the infection and the patient's risk factors.

- ***Oral Antibiotics:*** For uncomplicated cellulitis, oral antibiotics that target both *S. pyogenes* and *S. aureus* are recommended. Common choices include:
  - Penicillin (for susceptible strains of *S. pyogenes*)
  - Cephalosporins (e.g., cefalexin)
  - Clindamycin or erythromycin (for penicillin-allergic patients)
  - Dicloxacillin or amoxicillin-clavulanate (for *S. aureus*, including methicillin-sensitive strains)
- ***Intravenous Antibiotics:*** For more severe cases or in patients with systemic symptoms (e.g., high fever or significant cellulitis), intravenous antibiotics may be required. Options include:
  - Cefazolin or ceftriaxone (for broad coverage against both *S. pyogenes* and *S. aureus*)
  - Vancomycin or clindamycin (for MRSA coverage in suspected or confirmed methicillin-resistant *S. aureus* infections)

Management of Recurrent Cellulitis

In patients with recurrent cellulitis, particularly those with predisposing conditions (e.g., diabetes, lymphedema, venous insufficiency), prolonged antimicrobial prophylaxis may be considered. Prophylactic therapy has been shown to be effective in reducing the frequency of recurrence and is generally well tolerated. The duration of prophylaxis can range from several months to years, depending on individual risk factors and recurrence patterns.

Long-term antibiotics that target both streptococci and staphylococci, such as penicillin or cephalexin, are typically recommended for prophylaxis. In individuals at high risk of recurrent infections or those with a history of MRSA, clindamycin or trimethoprim-sulfamethoxazole may be used.

Surgical Intervention

In some cases, surgical intervention may be required, especially when there is an associated abscess or collection of pus that needs to be drained. Drainage is important for cases where the infection is localized, and conservative antibiotic therapy alone may not be sufficient.

Prevention

Preventive measures are crucial, particularly in individuals with recurrent cellulitis. Strategies include:

- *Wound care:* Proper cleaning and management of skin wounds to prevent infection.
- *Skin care:* Regular moisturization and management of chronic skin conditions such as eczema, which can predispose individuals to cellulitis.
- *Vaccination*: Ensuring vaccination against *Haemophilus influenzae* type B in children under 3 years of age can help prevent this pathogen as a cause of cellulitis.

Conclusion

Cellulitis is a common but potentially serious skin infection that requires prompt recognition and treatment. Early intervention with appropriate antibiotics based on the most likely pathogens is essential for preventing complications. In recurrent cases, long-term prophylactic antibiotic therapy can be effective in reducing recurrence. Ongoing research into bacterial virulence factors and the development of more targeted therapies holds promise for improving the management of cellulitis in the future.

References

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