

Erythema Nodosum

Erythema nodosum (EN) is a form of panniculitis, an inflammatory condition affecting the subcutaneous fat. It is characterized by the sudden onset of painful, raised nodules primarily located on the shins, although it can also involve other areas such as the thighs, elbows, and forearms. The condition is often associated with a general sense of malaise, resembling flu-like symptoms. EN typically occurs in young adults, with a higher prevalence in women compared to men. The lesions of erythema nodosum can range in size and evolve through various color changes, making them both clinically distinctive and diagnostically challenging.

Epidemiology and Demographics

Erythema nodosum primarily affects young adults, particularly those between the ages of 15 and 30 years. The condition is notably more common in women, with a female-to-male ratio of approximately 3:1. Although EN can occur in any age group, it is rare in children and the elderly. The incidence of erythema nodosum may be higher in specific populations with increased exposure to infectious agents or certain medications, and it is more frequently reported in developing countries due to higher rates of infectious diseases like tuberculosis.

Pathophysiology and Etiology

Erythema nodosum is characterized by inflammation of the subcutaneous fat (panniculitis), leading to the formation of painful nodules. The exact pathogenesis of EN is not fully understood, but it is thought to be mediated by a delayed-type hypersensitivity reaction, in which immune cells (including T-lymphocytes) infiltrate the subcutaneous tissue in response to various triggers.

The causes of erythema nodosum are diverse, and the condition can be triggered by a range of infectious, medication-related, and autoimmune factors. Some of the most common causes include:

➤ **Infections:**

- *Bacterial:* The most frequently implicated bacterial infection is group A Streptococcus, particularly following a throat infection or scarlet fever. Tuberculosis and Leprosy are also recognized as causes in endemic areas.
- *Viral:* Hepatitis B and C and cytomegalovirus have been associated with erythema nodosum, though these are less common triggers.

➤ **Medications:**

- Sulfonamides, oral contraceptives, and antibiotics are the most well-documented drug triggers. Nonsteroidal anti-inflammatory drugs (NSAIDs) have also been implicated, though this association is less pronounced.

➤ **Systemic conditions:**

- Autoimmune disorders, such as inflammatory bowel disease, particularly Crohn's disease, and sarcoidosis, have been linked to EN.
- Pregnancy can also predispose women to developing erythema nodosum, potentially due to hormonal and immunologic changes.
- **Other causes:**
 - Malignancies (particularly lymphomas) and pregnancy have been suggested as less common triggers.

Clinical Presentation

The clinical presentation of erythema nodosum is characterized by painful, raised red or purplish nodules that are typically located on the shins but may also appear on the forearms, thighs, and elbows. The lesions often begin as bright red and gradually become purple before eventually yellowing and resolving. The size of the nodules can range from 1–5 cm, and they are usually tender to the touch, making them uncomfortable, especially with pressure. As the lesions heal, residual hyperpigmentation may persist for weeks to months.

In addition to the characteristic skin lesions, patients may experience flu-like symptoms, including fever, malaise, and joint pain. The condition is generally self-limiting, with lesions typically resolving within 4–6 weeks, although recurrence is possible, especially if the underlying trigger is not addressed.

Diagnosis

The diagnosis of erythema nodosum is primarily clinical, based on the appearance and location of the characteristic nodules. However, because EN shares similarities with other conditions, it is important to differentiate it from other potential diagnoses, such as:

- Insect bites
- Pancreatitis
- Phlebitis
- Other forms of panniculitis

In some cases, additional diagnostic tests are necessary to determine the underlying cause. These may include:

- **Skin biopsy:** A biopsy may be performed to confirm the diagnosis and rule out other conditions. Histopathology typically reveals inflammation of the subcutaneous fat with a characteristic septal panniculitis pattern.
- **Blood tests:** Elevated erythrocyte sedimentation rate and C-reactive protein levels may be seen in active inflammation. Specific tests for infectious agents (e.g., streptococcal throat culture, tuberculosis screening) and autoimmune markers may be indicated based on clinical suspicion.

- **Chest X-ray:** A chest X-ray may be performed to rule out pulmonary tuberculosis or other infections.

Management and Treatment

The treatment of erythema nodosum focuses on addressing the underlying cause and relieving symptoms. In cases where the cause is identified, removal or treatment of the trigger is the most effective management strategy.

- **Symptomatic Treatment:**
 - NSAIDs (e.g., ibuprofen, naproxen) are the first-line treatment for reducing pain and inflammation. These medications help alleviate symptoms and reduce the swelling of the nodules.
 - Bed rest is often recommended to minimize discomfort, particularly in the acute phase of the condition.
- **Corticosteroids:**
 - Oral corticosteroids (e.g., prednisone) may be considered for severe cases or those with persistent symptoms. Injections may also be used for particularly large or painful nodules.
- **Potassium Iodide:**
 - Oral potassium iodide is another treatment option that has shown efficacy in reducing the inflammation associated with erythema nodosum. However, it is often avoided due to its unpleasant taste and potential side effects, and should be used with caution.
- **Management of Underlying Causes:**
 - If the erythema nodosum is triggered by an infection, appropriate antibiotics or antivirals are administered. In cases of autoimmune disorders, treatment of the underlying disease may lead to resolution of the EN lesions.
 - In the case of drug-induced erythema nodosum, discontinuation of the offending medication is essential. If medications such as oral contraceptives or sulfonamides are implicated, alternative options should be considered.
- **Supportive Care:**
 - Compression stockings and elevating the legs may help relieve swelling and discomfort in patients with lower extremity involvement.

Prognosis

The prognosis for erythema nodosum is generally favorable, as most cases resolve within 4 to 6 weeks with supportive care. However, the condition can recur, particularly in cases where the underlying cause is not identified or treated effectively. Patients who experience frequent recurrences may benefit from prophylactic treatment or closer management of underlying conditions.

Conclusion

Erythema nodosum is a painful but often self-limiting inflammatory condition that can be triggered by various factors, including infections, medications, and systemic diseases. The diagnosis is primarily clinical, with biopsy and lab tests aiding in determining the underlying cause. Treatment typically focuses on symptom relief, removal of the trigger, and addressing any underlying conditions. Early identification and management can lead to a favorable outcome, but recurrent cases may require long-term management strategies.

References

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