Erythema nodosum and reactive arthritis accompanying tuberculosis: A case report

Poonam Singh[1], Gunvant Singh Eske[2]

From[1]Delhi Newborn Centre, Pitampura, New Delhi, [2]Department of Pediatrics, Gajra Raja Medical College, Gwalior, Madhya Pradesh, India

Correspondence to: Gunvant Singh Eske, Department of Pediatrics, Gajra Raja Medical College, Gwalior - 474 009, Madhya Pradesh, India. E-mail: gunvant987@gmail.com

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ABSTRACT

Erythema nodosum (EN) is the most common panniculitis, appearing as crops of erythematous nodules located symmetrically on the anterior aspect of lower extremities. It is precipitated by several infectious and non-infectious causes with primary tuberculosis (TB) being its most common cause in developing countries. Reactive arthritis associated with TB is known as "Poncet's disease." It is an aseptic polyarthritis, developing in the presence of active TB elsewhere. We are presenting an interesting case of 12-year-old female child with EN and reactive arthritis. She presented with fever and large joints polyarthritis for 1.5 months and lesions suggestive of EN with anorexia and weight loss with a positive family history of pulmonary TB in two other siblings. On the basis of clinical findings, raised erythrocyte sedimentation rate, C-reactive protein, and positive Mantoux, the child was diagnosed to have TB with EN and reactive arthritis. Child markedly improved with antitubercular treatment.

Key words: *Antitubercular agents, Reactive arthritis, Tuberculosis.*

Tuberculosis (TB) is a very common infection in developing countries like India and has a myriad presentation, which can be caused either due to direct bacterial invasion or as a result of hypersensitivity phenomena with tuberculo-proteins [1]. This case is important because our patient presented simultaneously with two hypersensitivity reactions, that is, erythema nodosum (EN) and reactive arthritis without any evidence of active primary tuberculous lesion elsewhere, constituting early and only sign of TB in the present case. Hence, it was an atypical presentation of a common disease. We are presenting a case of 12-year-old female child with EN and reactive arthritis.

CASE REPORT

A 12-year-old female child belonging to lower socioeconomic status presented in the pediatric outpatient department with a history of on and off high-grade fever associated with chills, pain, and swelling in multiple large joints of knee, wrist, and ankle for 1.5 months. After 15 days she developed painful purplish black nodular spots on the anterior aspect of legs and dorsum of foot associated with anorexia and weight loss. Her two other siblings received treatment for pulmonary TB. There were no symptoms of cough, expectoration, sore throat, photosensitivity, oral ulcers, redness of the eyes, bleeding tendency, glandular swellings in the neck, chronic diarrhea, and history of drug intake apart from paracetamol and ibuprofen for fever and pain.

Examination revealed stable vitals with a pulse rate of 110/min, respiratory rate 20/min with a blood pressure of 110/60 mm of Hg. The child was febrile with a temperature of 101 F at admission. A local examination showed purple to black, slightly elevated, firm and tender nodular swellings on the anterior aspect of both legs which became more confluent on the dorsum of foot (Fig. 1). Movements at the knee, ankle, and wrist were tender without obvious swelling. Systemic examination was within normal limits.

Investigations depicted anemia (hemoglobin - 7.9 g/dl), total leukocyte count - 14500/mm^3 with 60% neutrophils and 36% lymphocytes, raised Erythrocyte Sedimentation Rate (ESR) (68 mm in the first hour), positive C-reactive protein (CRP), and strongly positive Mantoux test (30 mm × 30 mm). Collagen profile (antinuclear antibody [ANA]; anti-double-stranded DNA antibodies and rheumatoid factor), urine routine microscopy, antistreptolysin O, chest X-ray, sputum for acid-fast bacilli, and Sonography of abdomen were normal. Biopsy of skin lesion was planned, but parents did not give consent. Dermatological consultation further supported skin lesions to be EN. TB confirmation with cartridge-based nucleic acid amplification test could not be done.

On the basis of clinical findings, raised ESR, CRP, and positive Mantoux, the child was diagnosed to have TB with EN and reactive arthritis, but no primary focus of TB was identified. A close differential diagnosis in this patient was systemic lupus erythematosus because the patient was an adolescent female

presenting with fever, rash, arthritis, and anemia but a negative ANA excluded the possibility. Antitubercular treatment was started following 2 weeks of which fever and joint complaints subsided, and no new crops of skin lesions appeared. The child was adherent to antituberculous therapy, and lesions cleared in follow-up after 2 months (Fig. 2).

DISCUSSION

EN manifests as indurated red, hot, elevated, tender, and ovoid skin nodules 1–3 cm in diameter showing septal panniculitis on histopathological examination [2]. The most common site of involvement is pretibial region. Apart from this, extensor surfaces of the forearm, the thighs, and the trunk may also be affected. Lesions may past for 2 weeks, but new outcroppings may continue to arise for up to 6 weeks. It takes approximately 1 to 2 months to heal completely and may assume a bruise-like appearance while fading. EN is usually a non-ulcerative lesion resolving without atrophy or scarring.

EN occurs in approximately 1–5 per 100,000 persons. Female preponderance is seen among adults with a male-to-female ratio of 1:6 [3]. In children, the sex ratio is 1:1 [4]. Peak incidence occurs in persons between 20 and 30 years of age, although it can occur at any age.

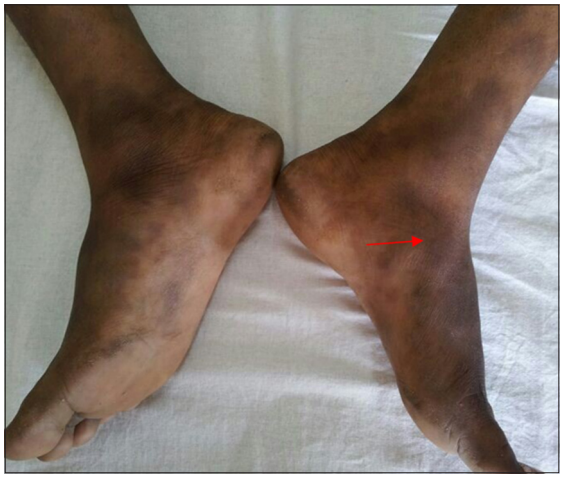

Figure 1: Antero-medial aspect of legs showing erythema nodosum

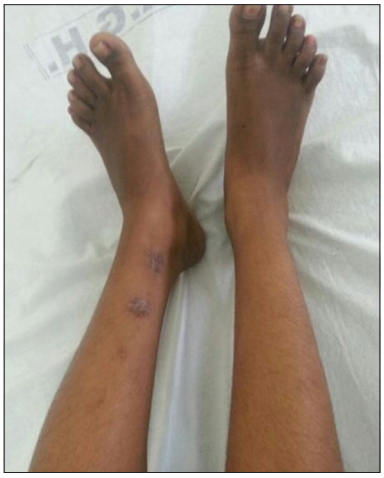

Figure 2: Clearance of lesions after 2 months of antitubercular therapy

Factors precipitating EN include several infectious, non-infectious and pharmacological agents, e.g., infections, systemic inflammatory diseases, malignancies, sarcoidosis, rheumatologic disorders, inflammatory bowel diseases, and pregnancy [2]. Primary TB is the most frequent cause of EN in developing countries [5], whereas streptococcal infections are the common cause of EN in western countries [3]. It has been reported to accompany primary tuberculous infection in 1–2% of British and 5–15% of Scandinavian cases [6]. In the etiological analysis of a case series of 15 patients with EN in a community hospital in Chennai, India, revealed TB as the most common cause occurring in 7 out of 15 patients [7]. EN associated with TB is always accompanied by strongly positive Mantoux test where it can occur without detectable focus and a negative skin test rules out TB as etiology [8].

EN usually occurs during the early phase of primary tubercular infection. Lesions are devoid of bacilli instead high levels of immune complexes are commonly observed in blood indicating EN to be a hypersensitivity phenomenon. The appearance of EN coincides in time with tuberculin conversion, and therefore many times can be the first sign of TB. In some cases, immune phenomena may manifest as arthralgia [9]. This reactive arthritis associated with TB is also called "Poncet's disease." It is an aseptic polyarthritis, developing in the presence of active TB elsewhere. It is mainly associated with extra-pulmonary TB, and the presence of EN is an important hallmark of this disease [10]. It responds within few weeks of starting antituberculous therapy as in the present case. Synovial tissue analysis in the present case was not done because treatment in both septic tubercular arthritis, as well as reactive arthritis, is same and synovial tissue biopsies of TB arthritis may be complicated by fistulae [11]. Septic tuberculous arthritis responds slowly to anti-TB drug treatment [11], whereas reactive arthritis responds quickly.

CONCLUSIONS

The most important step in the management of EN is the treatment of the underlying disorder. In a country like India, all patients with EN should be investigated for TB, and anti-tubercular therapy should be initiated for EN in a patient with positive Mantoux test with or without an identified focus of infection. Arthritis, especially polyarthritis in a patient of suspected TB, is not always due to actual mycobacterial infection but more likely to be reactive arthritis.

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