CASO CLÍNICO / *CLINICAL CASE*

Paniculite por *Streptococcus pyogenes*

Infectious Panniculitis caused by Streptococcus pyogenes

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/ Resumo

Introdução: A paniculite é um processo inflamatório do tecido celular subcutâneo. A paniculite infecciosa é rara na criança imunocompetente e uma forma pouco habitual de infecção por estreptococos beta-hemolíticos do grupo A (GABHS).
Descrição do Caso: Criança de 13 meses, do sexo feminino, previamente saudável, com febre (> 39º) com três dias de evolução e exantema eritematoso, não pruriginoso no tórax, abdómen, dorso e região axilar esquerda, com progressão para lesões nodulares, palpáveis com 5 a 10 mm de diâmetro, eritematopurpuricas, não dolorosas. À observação apresentava-se irritável e taquicardica. Analiticamente registava-se anemia, leucocitose com neutrofilia e PCR 171 mg/L. A ecografia dos tecidos moles era compatível com paniculite, sem áreas abcedadas. Na hemocultura isolou-se *Streptococcus pyogenes* e foi medicada com penicilina e clindamicina ficando apirética após 4 dias com regressão das lesões nodulares. Posteriormente por recusa no apoio plantar realizou ressonância magnética, que revelou osteomielite do astrágalo direito, pelo que após a alta manteve amoxicilina durante 4 semanas, com resolução completa das queixas,
Conclusões: A paniculite infecciosa é uma condição rara na infância, particularmente na criança imunocompetente. A infecção por GABHS pode cursar com paniculite, mas não é frequente, o que torna este caso particularmente interessante.

Palavras-chave: *Streptococcus pyogenes*, paniculite, infância

/ Abstract

Panniculitis refers to disorders with the inflammation of the subcutaneous tissue. Infectious panniculitis is rare in childhood and an unusual presentation of Group A b-haemolytic streptococcus (GABHS) infection.

A 13-month-old, previously healthy girl, presented with a three-day fever (> 39ºC) and erythematous, non pruriginous rash on her thorax, abdomen, back, and left armpit, which progressed to palpable, non-painful, subcutaneous, nodules with an erythematopurpuric halo. Physical examination revealed an irritable infant, with tachycardia. Laboratory testing showed anaemia, leukocytosis with neutrophilia, and CRP 171 mg/L. Soft tissue ultrasound was compatible with panniculitis with no abscessed areas. Streptococcus pyogenes *was isolated from a blood culture. Penicillin and clindamycin were started, with sustained apyrexia starting from the fourth day of treatment. The lesions progressively regressed. Due to the refusal of right plantar support, an MRI was performed revealing the osteomyelitis of the right astragalus. She maintained antibiotic treatment with amoxicillin after discharge for 4 weeks, with the complete resolution of the complaints.*

Conclusion: *Infectious panniculitis is a rare condition in childhood especially without immunodeficiency. GABHS may be the cause of infectious panniculitis, but is not a frequent agent, making this specific case particularly interesting.*

Keywords: Streptococcus pyogenes, *panniculitis, childhood tuberculosis; Risk factors; Immunosuppression*

/ Introduction

Panniculitis refers to disorders with inflammation of the subcutaneous fat. It can be a primary process, part of a systemic disorder, or occur as a result of trauma, infection, or medications. The common clinical features of panniculitis are erythematous subcutaneous nodules.[1] Certain types of panniculitides such as erythema nodosum, the most common panniculitis in children, subcutaneous fat necrosis of the newborn, scleroderma neonatorum, post-steroid panniculitis and cold panniculitis are seen more commonly or exclusively in children, whereas others are rare in childhood, such as infectious panniculitis.[1,2] Patients who are immunosuppressed are at highest risk for this type of panniculitis, but childhood occurrence is rare even in this subgroup.[1]

Infectious panniculitis may occur as a primary infection or secondarily, via hematogenous dissemination with subsequent infection of the subcutaneous tissue.

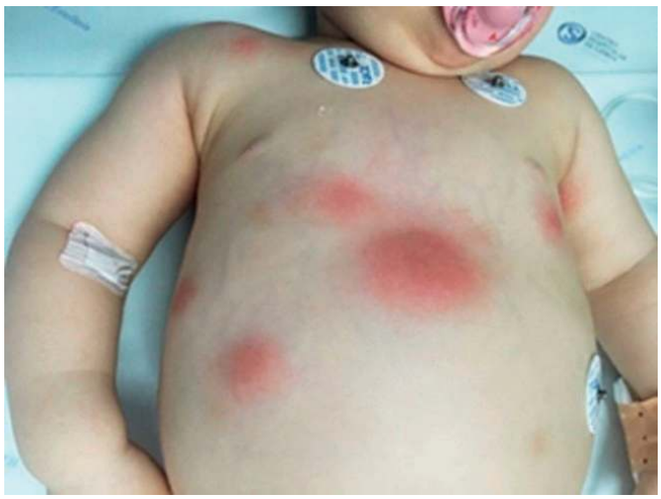
Extension to the subcutaneous tissue from an underlying source of infection is also possible. Hematogenous dissemination resulting in infective panniculitis is typically seen in the setting of sepsis. This commonly manifests as multiple or sometimes single nodules, most predominantly found on the peripheral extremities.[3]

Group A b-haemolytic streptococcus (GABHS) is a major human-specific bacterial pathogen that causes a wide array of manifestations ranging from mild localized infections to life-threatening invasive infections.[4]]

We describe a clinical case of an immunocompetent 13-month-old infant with GABHS bacteraemia who developed an associated widespread panniculitis.

/ Case Report

A 13-month-old, previously healthy girl, presented with a three-day history of fever (> 39°C), every 4 hours and erythematous, non pruriginous rash on her thorax, abdomen, back, and left armpit, which had progressed to palpable, non-painful, subcutaneous, nodules with an erythematopurpuric halo that was 10 mm to 15 mm in diameter (Figure 1a and 1b). She had no known drug allergies. The child's immunizations were up to date. The mother denied any family history of immunodeficiency. No close contacts were noted to have similar symptoms. Physical examination revealed an irritable infant, with sustained tachycardia, capillary refill time of 2 seconds, with a normal neurological exam and no organomegalies. The remainder of her observation was normal. Laboratory testing was remarkable for



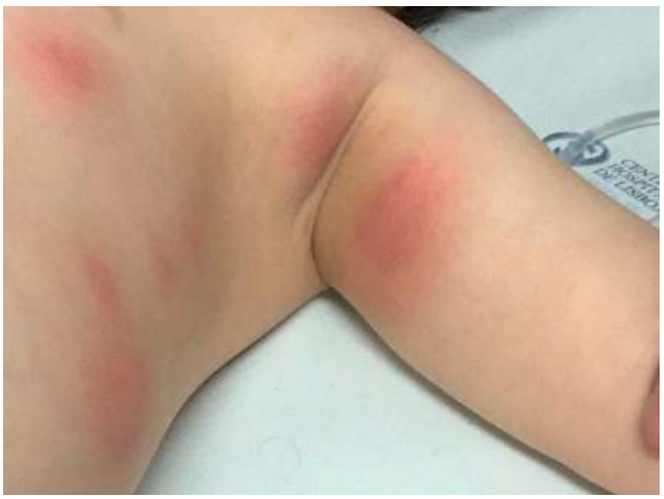


Figure 1a and 1b – Nodular erythematopurpuric lesions on the thorax, abdomen, and left armpit on the fifth day of disease

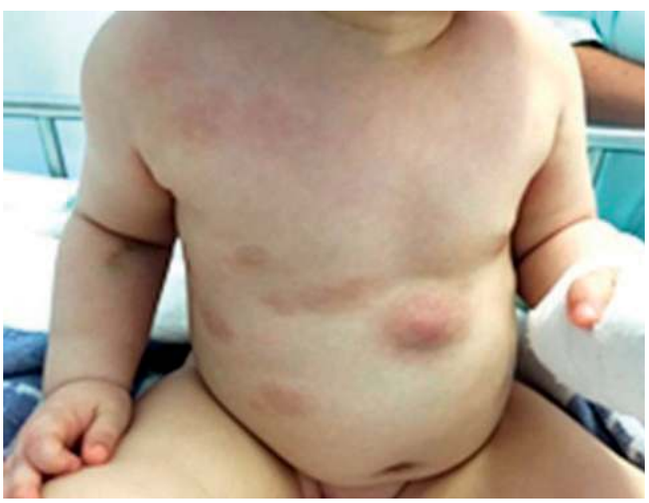


Figure 2 – Regression of the cutaneous lesions after antibiotic therapy

anaemia (hemoglobin 10.2 g/d), leukocytosis (leukocyte 15.1 x 10^9/µL) with neutrophilia (neutrophils 9.1 x 10^9/µL) and elevated C-reactive protein (CRP) with a maximum value of 171 mg/L. Soft tissue ultrasound was performed and the images were compatible with panniculitis with no abscessed areas.

The patient was admitted, and penicillin and clindamycin were started. *Streptococcus pyogenes* was isolated from a blood culture on the second day after admission. She gradually improved, with a normal heart rate for her age after 48 hours of treatment, becoming more active and less irritable, with sustained apyrexia starting from the fourth day of treatment. The lesions progressively regressed, acquiring a brownish (Fig. 2). Given the evidence of bacteraemia associated with panniculitis documented int the ultrasound and positive evolution under directed antibiotic treatment, a skin biopsy was thought to be dispensable in this specific case. Laboratory evaluation also showed improvement, and on the fifth day of antibiotic therapy the inflammatory parameters had significantly lowered with Leukocytes 11.32 x 10^9/µL (with 4.075 x 10^9/µL neutrophils) and CRP 40.9 mg/L.

Despite the overall positive evolution, on the sixth day after admission the patient showed refusal of right plantar support. She had no fever, or inflammatory signs of the tibiotarsic joint or foot. An ultrasound of the right tiobiotarsic joint was performed, showing synovial thickening on the internal articular recess. Magnetic resonance imaging (MRI) of the right lower limb revealed an osteomyelitis focus of the right astragalus. The patient

was discharged after completing 11 days of intravenous therapy with penicillin and clindamycin, with clinical and laboratorial improvement, and had no need for surgical intervention. She maintained amoxicillin orally for a period of 4 weeks, with complete resolution of the complaints.

/ Discussion

Group A b-haemolytic streptococcus (GABHS) can cause a wide variety of cutaneous and soft-tissue infections. The clinical spectrum of lesions ranges from impetigo, which affects superficial layers of the skin to erysipelas and cellulitis, affecting intermediate layers; to necrotizing fasciitis, which involves deeper tissue (fascia).[2] Infectious panniculitis is rarely observed during childhood. Typically, this clinical entity occurs in adults, particularly in the setting of underlying immunodeficiency.[5]

Panniculitis can be associated with GABHS upper respiratory infection, as observed with erythema nodosum (EN). However, GABHS associated widespread eruptive panniculitis in an immunocompetent infant is an extremely rare presentation.[2,6]

Erythema nodosum is the most common type of panniculitis in all ages, but it is rare below 2 years old. It is a hypersensitivity response, with streptococcal infections accounting for most cases in children. EN has a predictable evolution in colour over time, from red to purple to yellow green, resulting in bruise-like changes, resolving over the course of 2 to 6 weeks.[1] The quick resolution of the lesions with treatment and absence of these typical colour changes, argue against this diagnosis in this specific case. Although skin biopsy was not performed, the suggestive visual aspect of the lesions, accompanied by clinical signs of sepsis, GABHS-positive blood culture, and the fast regression of the lesions after directed antibiotic therapy, all support the idea that multiple lesions of panniculitis were infected with GABHS.

The case described in this article, becomes particularly interesting, since in the reports found in the literature, streptococcal panniculitis is usually confined to one area of the extremities.[10] In this patient multiple nodules were observed on the thorax, abdomen, and left armpit, which is an unusual aspect.

The exact mechanism by which GABHS infection originate multiple lesions in widely distributed foci remains unclear. Several genome-encoded virulence factors such as pili, M proteins, leukocidins, streptolysins, complement inhibiting proteins, immunoglobulin-degrading enzymes, and superantigens have been detected in S. pyogenes.[4] The emm gene, encoding the M protein, a structure that protects the bacteria against phagocytosis is an epidemiological marker for GAS.[7] Emm types seem to be correlated to some specific disease manifestations and age of the patients. In the STREP-Euro study emm1, emm3, emm28, emm12, and emm 89 accounted for 55% of invasive isolates.The most frequent emm types in children, were, in descending order, emm1, emm12, emm4 and emm3, and emm28.[8] GABHS organisms have a predilection for establishing primary infection in certain tissues and is commonly associated with skin or throat infections.[4,8,9] Possibly, the organism that caused the bacteraemia of this child may have a genetic predisposition for invading fat tissue, causing the panniculitis foci described.

It is known that patients with GABHS bacteraemia can develop secondary infections, with musculoskeletal infections being most common focal infections resulting from the bacteraemia. Indeed, GABHS infection accounts for up to 10% of cases of acute hematogenous osteomyelitis (AHO) and is particularly prevalent in preschool- and early school-aged children.[9]

Although very rare in the immunocompetent child, GABHS panniculitis should be considered in the differential diagnosis when there are suggestive skin lesions such as the erythematous subcutaneous nodules seen on our patient, especially in the presence of systemic involvement with haemodynamic changes.

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