Clinical and therapeutic data of a child with ecthyma gangrenosum

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The presence of the *Pseudomonas aeruginosa* infection in healthy children is very uncommon. Infants may occasionally present with community-acquired sepsis due to *Pseudomonas aeruginosa*, preceded by prolonged contact with contaminated bath water. Ecthyma gangrenosum is a characteristic dermatological manifestation caused most commonly by *Pseudomonas aeruginosa*. We describe the clinical data and therapeutic management of a 6 month-old infant with ecthyma gangrenousum caused by *Pseudomonas aeruginosa*, complicated with septicaemia and meningitis. The infant was immunodeficient as indicated by hypogammaglobulinemia, neutropenia, and a low level of C3 complement component.

Key words: Pseudomonas aeruginosa, Ecthyma gangrenosum, Immunodeficiency, Neutropeni, Infant.

Introduction

Ecthyma gangrenosum (EG) is a characteristic dermatological infection caused most commonly by *Pseudomonas Aeruginosa* that penetrates deep, involving the dermis (1, 2, 4). The lesions begin as pink macules and progress to purple nodules, which become hemorrhagic eventually turning to ulcers with ecchymotic and gangrenous centres, with an eschar formation surrounded by an intense red areola (1, 2). These lesions are characterised by metastatic dissemination, bacterial invasion of blood vessels and deep abscesses (1). Ecthyma gangrenousum is caused by direct inoculation or it could be secondary to septicaemia. The most important predisposing factor that can lead to ecthyma gangrenousum is the presence of any kind of immunodeficiency associated with severe neutropenia (3, 10, 12). Other predisposing factors are low-birthweight, malnutrition, cystic fibrosis and immunosuppressive therapy.

Case report

A six-month-old child from Patos (South Albania) was admitted to the PICU of the University Hospital Center in Tirana, after 10 days of fever, vomiting and skin lesions. The initial lesion was a pink macula, which progressed to a purple nodule that became hemorrhagic and finally necrotic with scar

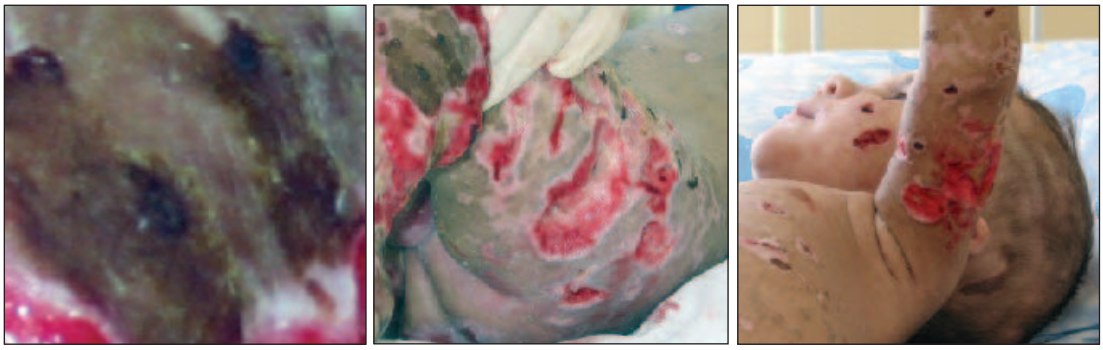

Figure 1 Distribution of ulcers and necrotic lesions in our patient.

formation, surrounded by an intense red areola.

Subsequent lesions with similar progression developed on the lower and upper extremities, despite outpatient treatment with oral antibiotics (amoxicillin and clavulanic). The child presented with a high fever (temperature 39-40°C) and vomiting. On physical examination the child was toxic febrile, drowsy, with oedema, tachypnoe, tachycardia, bulging fontanel and characteristic skin lesions: pink macules, purple nodules, hemorrhagic nodules progressing to ulcers and necrotic lesions (Figure 1).

Laboratory data: Red Blood Cells: 4130000/µl; White Blood Cells: 2400/µl; absolute neutrophil count: 480 cells/mm^3; Platelets: 97000/µl; erythrocyte sedimentation rate: 42 mm/hour; C-Reactive Protein-190mg/dl; Fibrinogen-550 mg/dl. The cerebrospinal fluid (CSF) was turbid, with leucocytosis greater than 1000/mm^3 and neutrophilic predominance (85%). Bacterial cultures were obtained from skin, blood, stool and urine, and antibiotic treatment with ceftriaxone + ampicillin was started. Dexamethason and mannitol were added for the management of meningitis). Despite the treatment new lesions appeared on both trunk and extremities, associated with deep abscesses. CSF and blood culture grew *Pseudomonas aeruginosa*. *Pseudomonas aeruginosa* was also isolated from the samples obtained from the necrotic skin lesions. Stool and urine cultures were negative. These result confirmed the diagnosis: Ecthyma gangrenosum caused by *Pseudomonas aeruginosa*, complicated with sepsis and meningitis. Having completed the analysis of clinical data with etiological diagnosis, the decision was taken to treat the patient with combination therapy according to literature data (10, 14): ceftazidime + gentamicin, intravenous immunoglobulin for three consecutive days, followed by ceftazidime + ciprofloxacin. Immunologic function evaluation revealed low levels of C3 complement (0.368 g/l) and IgM (0.28 g/l). Elisa HIV was negative.

Three weeks after the beginning of therapy the clinical improvement was evident. The fever decreased, the cerebrospinal fluid was sterile and the erythrocyte sedimentation rate returned to normal. The culture obtained from the skin lesions produced no growth of pathogens. Although child improved clinically, and while awaiting surgical correction of the deep and large necrotic lesions, due to the immunologic status of the patient, local debridement was done, associated with antibiotic coverage to prevent a bacterial superposition. Forty days after admission, the patient was transferred for plastic surgical correction. After the reconstructive surgery, the child's situation appears satisfactory.

Discussion

The presence of *Pseudomonas aeruginosa aeruginosa* infection in previously healthy and imunocompetent children is very uncommon. Infants may occasionally present with community-acquired sepsis due to *Pseudomonas aeruginosa aeruginosa*, but this is very rare and is preceded by prolonged contact with contaminated bath water (1). The clinical appearance is very characteristic. The main site of EG lesions is the gluteal or perineal region (57%), although these lesions can spread to other body sites, as in our patient, in whom metastatic lesions appeared on both the trunk and lower extremities. Once considered unusual, ecthyma gangrenousum has received special attention in medical literature in recent years (4, 5, 11, 12, 13, 14). This disease has been related to life-threatening septicaemic infections and high mortality (8, 9, 11, 13, 14). Mortality rates of Pseudomonas sepsis in immunocompromised persons range from 38 to 96 %, whereas the mortality rate in non-bacteremic patients is 15.4%. (13, 14) Delayed presentation for medical evaluation and treatment in the case reported here was a complicating factor probably contributing to the severity of the condition

One major clinical feature in this patient was the presence of neutropenia. We found a low level of C3 complement component and hypogamaglobulinemia, that indicate an inefficient phagocytosis (1, 14) and this may explain why this patient's case was complicated with sepsis and meningitis. Appropriate antibiotic coverage for *Pseudomonas aeruginosa* and surgical debridement of the necrotic areas are the key to successful treatment. In default of other antipseudomona antibiotics in our country, ciprofloxacin was selected in this case despite the young age of the patient, due to the lack. Intravenous immunoglobulin was administered as well, and may have contributed to the favourable outcome. This successful empirical intervention has been previously reported in children with sepsis secondary to *Pseudomonas aeruginosa* (11).

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