Haemophilus influenzae Type b Cellulitis of the Lower Extremity in a Non-immunocompromised Elderly Patient

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An 83-year-old non-immunocompromised man who developed *Haemophilus influenzae* cellulitis on his lower left leg is described. *H. influenzae* type b was isolated by conventional bacteriological cultures from one blood culture and from a cutaneous blister fluid aspirate, and identified within the dermis by immunofluorescence on a punch biopsy of lesional skin. Evolution was characterized by a slow healing during appropriate systemic antibiotherapy, and absence of any significant increase in antibodies to the capsular polysaccharide of *H. influenzae* type b.

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Haemophilus influenzae type b rarely causes cellulitis in adults (1–5), whereas it is a very common cause of this disorder in children (6). *H. influenzae* type b cellulitis occurs on the face, trunk or neck and is generally associated with bacteriaemia and/or respiratory infections in both children (6) and adults (1–5). We report here the first case of *H. influenzae* type b cellulitis of the limb occurring in an adult patient.

CASE REPORT

An 83-year-old man was admitted to the hospital in December 1987 after a 24-hour history of increasing swelling and pain of the left ankle without evidence of trauma, insect bite, or broken skin. He was only treated with captopril (25 mg each day) for an essential hypertension. On admission, the rectal temperature was 39.3°C and blood pressure, 140/80 mmHg. Skin examination revealed an area of painful red-purple swelling over the left ankle extending to the dorsum of the foot, with indistinct margins, increased warmth and, in places, purpuric patches and bullae. There was neither evidence of joint involvement, nor lymph glandular enlargement. Physical examination did not reveal any abnormal findings of the cardiovascular, respiratory and central nervous systems, other than mild lethargy.

Initial laboratory data revealed an erythrocyte sedimentation rate of 74 mm/h; white blood cell count, 13 400/mm^3 (85% polymorphonuclear neutrophils, 8% lymphocytes and 7% monocytes); platelet count, 223 000/mm^3; hemoglobin, 13.6 mg/dl, and serum glucose, 7.7 mmol/l. All other routine laboratory data were within normal limits and chest radiographs were normal.

Haemophilus influenzae type b biotype 1 was isolated from one of three blood cultures and from a cutaneous blister fluid aspirate, whereas bronchial secretions and urine showed no growth. Immunofluorescence studies were performed on a 4-mm punch biopsy specimen of lesional skin using FITC-conjugated anti-*Streptococcus* A, C, D, G antisera as previously described (7), and rabbit anti-*Haemophilus b* antiserum (Statens seruminstitute, Copenhagen, Denmark). By immunofluorescence several small colonies of *Haemophilus b* were identified in papillary and reticular dermis.

The patient was treated with penicillin G (30 million U daily) and gentamycin (80 mg twice daily) without any improvement over the first 48 h. Following the isolation of *H. influenzae* from blood and skin, penicillin was replaced by cefotaxime (3 g daily) for 10 days, which gave slow but complete healing of the cellulitis over the next 6 days.

Additional investigations failed to detect a selective immunoglobulin immunodeficiency. Serum protein electrophoresis revealed hypoprotidemia (total serum protein, 54 g/l) with hypogammaglobulinemia (5.3 g/l) and elevated α_2 globulins (5.8 g/l), whereas serum IgG (7.7 g/l), IgA (2.9 g/l), IgM (0.5 g/l), and IgG subclass (IgG1: 8.5 mg/ml; IgG2: 1.6 mg/ml; IgG3: 0.45 mg/ml; IgG: 0.14 mg/ml) levels were within normal limits. Using a previously described ELISA technique (8), very low titers of IgG, IgA and IgM antibodies (arbitrary units $\leq$ 7, 6 and 5, respectively) to the capsular polysaccharide of *H. influenzae* type b were detected 3 weeks and again 2 months after the initial infection.

DISCUSSION

In recent years, an increase in *Haemophilus influenzae* infections in adults has been suggested (1, 4, 9, 10), though to date, only 8 cases of *H. influenzae* cellulitis occurring in adult patients have been described in the literature (1–5), involving mainly the cervical and/or thoracic areas (1, 2, 4, 5), but never a limb as in our case. In contrast, a total of 59 cases of *H. influenzae* cellulitis of the extremities have been

recently counted in children (11). Using conventional bacteriological cultures, *H. influenzae* type b was isolated from skin lesions in only one adult patient with cellulitis (1). But to our knowledge, *H. influenzae* has not previously been detected on skin biopsy specimens of cellulitis by means of immunofluorescence technique.

Thus, our case confirms that immunofluorescence techniques provide relevant information to establish the precise bacterial cause of dermohypodermal infectious processes (7). The pathophysiology of *Haemophilus influenzae* cellulitis in adult patients is not fully established. *H. influenzae* respiratory infections, sometimes including mediastinitis (4, 5), are often associated with cellulitis, which is considered as a secondary disease. Predisposing conditions, such as malignancy (2), are rarely reported. In our case, the age of the patient (83 years) might be the unique predisposing factor for the *H. influenzae* infection. In this respect, the absence of immunization against the capsular polysaccharide of *H. influenzae* type b following the cellulitis episode is noteworthy, and might be related to mechanisms such as a defective opsonization of *Haemophilus influenzae* by sera of elderly patients, as was recently reported (12).

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