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Group G Streptococcus Bacteremia in Recurrent Cellulitis

Nicola di Meo[1], Giuseppe Stinco[2], Nicoletta Gubertini[1], Maria Martina Patriarca[2], Giusto Trevisan[1]

[1]Dermatology Department, University of Trieste; [2]Institute of Dermatology, Department of Experimental and Clinical Medicine, DISM, University of Udine, Udine, Italy

Corresponding author:
Nicola di Meo, MD
Dermatology Department
University of Trieste
Ospedale Maggiore di Trieste
IV piano Palazzina Infettivi
Piazza Ospedale 1
34151 Trieste
Italy
nickdimeo@libero.it

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SUMMARY In recent years, group G *Streptococcus* has been reported with increasing frequency as the cause of a variety of human infections. Underlying host factors such as immunosuppression, malignancy, diabetes mellitus, and rheumatoid arthritis may be predisposing conditions leading to infection. Toxic involvement and post-streptococcal sequalae, once believed to be exclusive to infections caused by group A *Streptococcus*, are now known to occur following acute group G *Streptococcus* and group C *Streptococcus* infections. We report on a case of group G Streptococcus bacteremia and recurrent cellulitis with toxic involvement. Patient blood cultures were always negative for β-hemolytic Streptococci in all the recurrences, except during the last one. Antibiotic therapy based on antibiogram quickly resolved the infection. A regimen of intramuscular injection of 1.2 million units of benzathine penicillin every 15 days for one year prevented recurrences of cellulitis.

KEY WORDS: cellulitis, recurrent; bacteremia; group G Streptococcus; therapy

INTRODUCTION

Streptococci are Gram-positive, catalase-negative cocci characteristically arranged in chains (1). The Lancefield Group antigens have been the traditional basis for routine classification of Streptococci, and most laboratories still use them. There are at least 18 classified species of streptococci (A to R). Groups A, B, C, D, and G are most often involved in human diseases. Group G Streptococci (GGS) are part of the normal microbial flora of the pharynx, gastrointestinal tract, vagina, and skin (2). In recent years GGS have been reported with increasing frequency as the cause of a variety of human infections, such as pharyngitis, cellulitis, meningitis, endocarditis, and sepsis (3,4,5). Bacteremia due to GGS has been strictly related to underlying host factors such as immunosuppression, malignancy and its treatments, diabetes mellitus, bone and joint diseases, cirrhosis, alcoholism, intravenous substance abuse, and breakdown of the skin (2-4,6,7).

Bacterial, non-necrotizing cellulitis is a localized and deep infection of the skin usually presenting with a high fever and the tendency to recur (1). The predominant infection site is on the lower extremities, while the face or arms are more rarely affected. Group A Streptococcus (GAS) was considered for a long time to be the main causative agent of that infection, although recently Streptococci of group G (GGS), group C (GCS), group B and, most rarely, staphylococci emerged as involved in the disease depending on specific epidemiological situations and/or risk factors (9). We report on a case of a female patient who developed GGS bacteremia and recurrent cellulitis with a toxic involvement.

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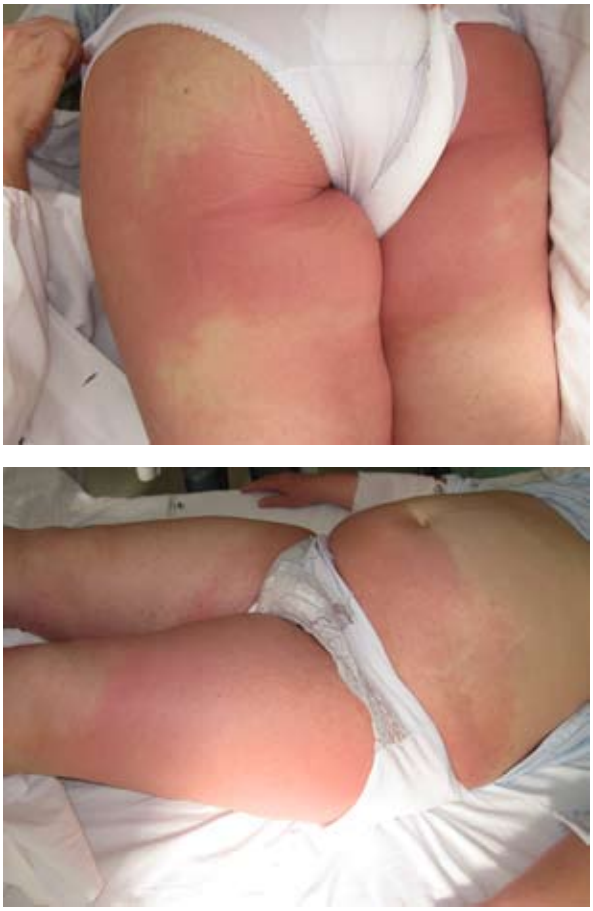

Figure 1a and 1b. Erythematous rash on hips and upper thighs

CASE REPORT

A 66 year-old woman affected by diabetes mellitus, obesity, and stage III (pT2, N1, Mx) squamous cell carcinoma of the vulva underwent radical vulvectomy, bilateral inguinal femoral nodal dissection and postoperative radiation two years prior to admission to our Department. The patient was referred with a three day history of fever, shivers, vomit, and buttock pain with swelling. She also developed a concomitant warm, erythematous rash on the regions of hip and both the upper thighs (Fig. 1a, Fig. 1b). She did not report any recent injury. She recalled five similar episodes involving the same body area with the same clinical manifestations, including two recorded events at our Institute. In each previous episode no positive blood cultures were detected, acute deep thrombosis was excluded by Doppler ultrasound, and the patient returned to normal healthy condition after empirical intravenous antibiotics. On admission, the patient was pyrexial (40 ºC) with tachycardic heart rate and malaise. An extensive area of warm erythema and edema involved the skin of the mid abdomen, the upper regions of the thighs, and the buttocks. Laboratory findings referred leukocytosis of 23.700/mm^3 and the blood culture was GGS positive. During the previous episode, the blood-agar Petri dish showed the presence of cocci characteristically arranged in chains (Fig. 2) and an agglutination test showed a positive reaction for group G Lancefield antigens (Fig. 3). On the basis of blood culture and the antibiogram, intravenous amoxicillin 1000 mg and clavulanate 200 mg were administered every eight hours. The clinical condition of the woman improved within a few days, the fever decreased, and the skin involvement rapidly reduced. Repeated blood cultures were negative. Pharyngeal, vaginal, and anal cultures were all negative for GGS. The patient was discharged after 10 days of therapy with clinical resolution. It was decided to introduce a regimen of intramuscular injection of 1.2 million units benzathine penicillin every 15 days for one year in order to prevent such recurrent episodes of cellulitis. One year after hospital discharge, the patient has not developed any further symptoms.

DISCUSSION

Severe invasive soft tissue infection, toxin production, or recurrent infections were once believed to be exclusive to infections caused by GAS. More recently, a stronger role of GGS has been noticed in cellulitis (7) and, with increasing frequency, in nonfocal bacteremia (4). Cellulitis is in fact more common in people with underlying venous and lymphatic impairment, and, in particular when recurrent, it is often associated with significant morbidity (9). Our patient had long-standing predisposing disorders that led to a major impairment of lymphatic circulation. During the last hospitalization, our patient presented with a specific toxic involvement due to GGS bacteremia, confirming that toxin-peptides production is not exclusively a GAS-associated trait but also concerns other groups

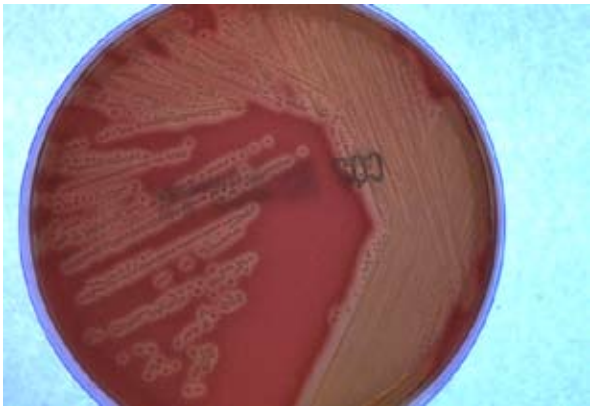

Figure 2. Blood-agar Petri dish; the presence of cocci characteristically arranged in chains.

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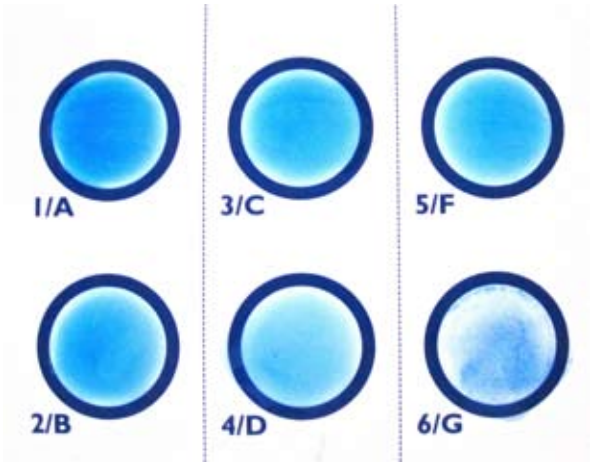

Figure 3. Agglutination test; a positive reaction for the group G Lancefield antigens.

of Streptococci. In each previous episodes of cellulitis no positive blood cultures were detected. Even though in case of these infections it is recommended to perform culture from skin and soft tissue samples, the utility of blood cultures remains controversial due to the low frequency of positive results, as confirmed by the literature (1,6).

Although serious community-acquired GGS infections occur with increasing frequency (6), they remain rare. The pathogen's persistence in the tissue, despite antibiotic treatment, contributes to the rate of recurrence. A previous episode of cellulitis seems to be a strong predisposing factor to future episodes (3,8). Various general and local risk factors play a role in recurrence, as does the patient's increased susceptibility to infection, such as the inability of the immune system to clear the bacteria from the infection site (9). When treating this infection it is therefore crucial to recognize the underlying comorbidity and to make a targeted diagnosis with both serial blood cultures and an agglutination test so as to choose the appropriate prophylactic antibiotic treatment in order to prevent relapses. Prompt treatment with appropriate antibiotics appears universally successful. Benzylpenicillin has been the mainstay of this treatment, although some patients are slow responders and may need a second antibiotic, such as clindamycin or gentamicin (10).

CONCUSION

Finally, it is necessary to take into account that a Streptococcal septicaemia or an extensive spread of cellulitis in a patient with many comorbidities may, despite adequate antibiotic therapy, progress to multiple-organ failure and death (8,10).

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