Infections In Oncology

RECURRENT CELLULITIS WITH GROUP G STREPTOCOCCUS BACTEREMIA IN A CANCER PATIENT: A CASE REPORT

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Introduction

Beta-hemolytic streptococcal infections can be categorized into Lancefield groups A to H and K to V. Groups A, B, C, D, and G are most often involved in human disease. Group A (Streptococcus pyogenes), one of the most common causes of pharyngitis, produces a variety of skin and soft-tissue infections including cellulitis, erysipelas, and necrotizing fasciitis. Group B (S. agalactiae) has been associated with a history of breast cancer1,2 and with sepsis and meningitis in neonates and peripartum fever in women. Group D includes the nonenterococci (ie, S. bovis) that are associated with gastrointestinal neoplasms and the enterococci (ie, Enterococcus faecalis, E. faecium) that are associated with urinary tract infections and polymicrobial intra-abdominal infections. Less commonly, beta-hemolytic streptococcal infections are caused by Lancefield groups C and G.

Group G streptococcus (GGS) causes a variety of infections including bursitis, tenosynovitis, septic arthritis, osteomyelitis, pleuropulmonary infections, puerperal sepsis, septic abortion, skin and soft-tissue infections, bacteremia, endocarditis, peritonitis, meningitis, and ophthalmitis.3 It has long been recognized as part of the normal flora of the skin, oropharynx, and the intestinal and genital tracts. Predisposing conditions leading to infection with GGS include malignancy, diabetes mellitus, alcoholism, rheumatoid arthritis, and other immunosuppressive states. Unlike group A streptococcus (GAS), GGS had not been associated with toxin production4,5 or recurrent infections5-8 until recently. We report a case of GGS bacteremia and recurrent cellulitis with toxin-like properties.

Case Description

A 67-year-old woman with stage IB squamous cell carcinoma of the cervix underwent radical hysterectomy, bilateral salpingo-oophorectomy, pelvic nodal dissection, and postoperative radiation therapy 10 years prior to admission. A long history of chronic lymphedema of the lower left leg resulted from prior surgery and radiation of the pelvic malignancy. She presented with a two-day history of fever, chills, nausea and vomiting, and pain in the left hip and leg with swelling. She concomitantly developed a warm, tender, erythematous rash over separate regions of her left hip and lower left leg. The patient denied any history of recent trauma or injury. Further questioning revealed at least six similar clinical presentations involving the same leg over the past seven years, including four documented episodes at our institute. One prior episode of similar presentation at another facility presented with positive blood cultures for GAS. In each of the previous occasions at our institute, the presence of acute, deep, venous thrombosis was eliminated by transvenous Doppler ultrasound, and the patient recovered after empirical intravenous antibiotics followed by oral penicillin at discharge. After she was discharged from the most recent hospital admission, desquamation of the skin involving the hands and lower legs followed the resolution of cellulitis of the left lower leg.

Physical examination was notable for a heart rate of 110 beats per minute, fever (T >102°F), chronic lymphedema, and pronounced swelling of the left lower leg. Discrete areas of blanching erythema, warmth, and tenderness involved the skin of the left mid abdomen, the anterior regions of the left leg, and the left buttock region (Figure). Admission laboratory values were unremarkable with the exception of a mild leukocytosis (white blood cell count of 15,200/mm3). A blood culture obtained on admission grew GGS.

An erythematous and pustulose rash is noted on the left thigh and buttock.
After initial intravenous oxacillin and later ticarcillin/clavulanate, 3 million units of intravenous penicillin G every four hours was administered after the blood culture was reported positive. The fever defervesced promptly, and all areas of erythema improved markedly within three days. Ultrasound Doppler studies of her left lower extremity demonstrated no evidence of acute venous thrombosis. Repeat blood cultures were all negative. Pharyngeal and vaginal cultures obtained after initiation of antimicrobial therapy revealed normal flora but no GGS. The patient was discharged after one week of intravenous antibiotics on a course of oral penicillin V. She also was to follow a regimen of monthly intramuscular injections of 2.4 million units of benzathine penicillin for one year to prevent further recurrences of cellulitis.

**Discussion**

GGS infections are known to colonize and infect patients with a history of underlying malignancies. From October 1986 to February 1998, only seven cases of GGS bacteremia have been documented at our institution. Bacteremias have more notably been seen in those with pre-existing edema due to a variety of causes. The usual portal of entry into the bloodstream is the skin, but areas of mucosal colonization could result in bacteremia. In our patient, chronic lymphedema and potential GGS colonization of the skin or genital tract could have led to recurrent infections, as was the case in a patient with chronic colonization of the esophagus by GGS. Monthly intramuscular injections of benzathine penicillin or oral penicillin V for at least a year should prevent these frequent recurrences.

Although GGS is a known cause of cellulitis and bacteremia, recurrences have rarely been reported. Our patient presented with her seventh episode of cellulitis in a seven-year period. On this most recent admission, her blood culture was positive for GGS. Unfortunately, during previous admissions at our institute, only one set of blood cultures was obtained after antibiotic therapy was initiated, which revealed no growth. The distribution of her erythema included separate areas on her left lower extremity as well as left buttock and left abdominal region. Also, a previous episode was followed by desquamation of the palms and soles. This suggests that a possible toxin-mediated mechanism might be involved in the clinical syndrome.

Unlike *S. aureus* and GAS, GGS has not been associated with toxin production until recently. In the first reported case, a woman presented with acute diffuse GGS myositis in association with toxic shock. The organism did not produce Group A streptococcal pyrogenic exotoxins, but it produced at least one new toxin with similar biologic properties. In another case, a woman with squamous cell carcinoma of the tongue presented with recurrent episodes of pharyngitis due to GGS. This strain also produced a novel toxin with biologic properties in common with those of GAS. This case highlights emerging aspects of GGS infections that were previously unknown -- its ability to exhibit toxin-like properties and to produce recurrent invasive infection.

**References**