CASE REPORT

GROUP C STREPTOCOCCAL BACTEREMIA: A CASE REPORT FROM INDIA

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Abstract. Group C streptococci are a common cause of infection in animals and a rare cause of bacteremia in human beings. The entity is often seen in elderly people with a severe underlying illness. We report here the only case of Group C streptococcal bacteremia reported in our hospital, caused by *Streptococcus equisimilis,* a beta-hemolytic Group C streptococcus. The patient was a 10-year old male with a known history of aplastic anemia. In spite of specific therapy with penicillin, the outcome was fatal.

Lancefield Group C streptococci (GCS) are a conglomeration of four different species of gram-positive microorganisms, differentiated by biochemical and other characteristics (Carmeli and Ruoff, 1995). They are common pathogens in animals but are being recognized as a cause of local and systemic infections in humans with increasing frequency in recent years. Bacteremia due to GCS is unusual; incidence being reported to be 0.05 episodes per 1,000 hospital admissions (Berenguer *et al*, 1992). Other reports of invasive GCS infections include sinusitis, soft tissue infections, infections of bones and joints, meningitis, pneumonitis, pericarditis, endocarditis and toxic shock syndrome (Bradley *et al*, 1991; Natoli *et al*, 1996). The majority of cases have been found in elderly patients (Bradley *et al*,1991; Bateman *et al*, 1993; Kristensen and Schonheyden, 1995). Of therapeutic concern is the observation that, though rare, these organisms may be more virulent, and may require special vigilance with regard to antibiotic tolerance and susceptibility patterns (Barson, 1986). We report a case of group C streptococcal bacteremia in a child in whom the infection proved fatal in spite of appropriate and specific therapy.

A 10-year-old male, known to have idiopathic aplastic anemia for one year was admitted to the hospital with a 12-hour history of high-grade fever with chills, severe pain in the bones, and generalized pain in the muscles. He had also experienced 2 episodes of hematemesis, accompanied by bleeding from the gums. On examination, he had a blood pressure of 110/70 mmHg, a pulse of 110/minute, respirations of 32/minute and a temperature of 40.8°C. The only other notable physical findings were oral thrush, the presence of blood clots within the oral cavity, multiple petechial lesions on the arms, trunk and face, and tender extremities. The chest and abdominal examination were unrevealing. Examination of the other systems was noncontributory. Laboratory studies revealed a hemoglobin level of 7.6 g/dl, a grossly reduced white blood cell count of 500/µl (neutropenia with 37% polymorphs, 53% lymphocytes, 6% eosinophils and 3% monocytes), and a platelet count of 40,000/µl. Routine blood chemistry and renal function tests were within normal limits.

A provisional diagnosis of septicemia was made and blood, urine, and throat swab specimens were sent for bacterial culture prior to the initiation of therapy. Both the throat and blood cultures grew beta-hemolytic streptococci resistant to bacitracin. The urine culture was negative. Rapid serogrouping performed by a latex agglutination test confirmed the beta-hemolytic streptococci as group C (Meritec Strep, Meridian Diagnostics, Italy, Europe). The group C streptococci were further speciated biochemically as *Streptococcus equisimilis*. In a standard Kirby-Bauer test, the isolates were sensitive to penicillin, cefuroxime, gentamicin, amikacin, erythromycin, co-trimoxazole, and ciprofloxacin. Antibiotic therapy, with parenterally administered penicillin (5 lac units four times daily), amikacin (500 mg twice daily), and metronidazole (200 mg thrice daily) was started. The patient was also treated vigorously with fluids, bicarbonate and dopamine. However, the fever persisted intermittently, accompanied by bleeding from multiple sites. His condition continued to deteriorate and

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he died on the 5th day after admission, following a massive gastrointestinal bleed.

Traditionally, streptococci belonging to Lancefield group C include four species: *S. equisimilis, S. zooepidemicus, S. equi,* and *S. dysgalactiae*; the first three of which are beta-hemolytic (Carmeli and Ruoff, 1995). *Streptococcus equisimilis* is the most common species isolated from humans. Since the recognition of GCS as a cause of human disease, GCS bacteremia has not been widely reported, except for some reviews and case reports from the West (Salata *et al*, 1989; Bradley *et al*, 1991; Berenguer *et al*, 1992; Nielsen and Kolmos, 1993; Carmeli and Ruoff,1995; Albarrracin *et al*, 1998).

We reviewed the medical literature from 1970 onwards for GCS bacteremia in the Asian subcontinent. The search uncovered only a few reports in 2 previous studies, Singapore (Tee *et al*, 2002) and Thailand (Srifuengfung *et al*, 1994). GCS arthritis has been reported in Israel (Schattner and Vosti, 1998) and *S. zooepidemicus* meningitis and bacteremia has been reported in Turkey (Ural *et al*, 2003). The All India Institute of Medical Sciences is a 1,500 bed teaching hospital which serves as both a community hospital and a tertiary care center. This is the first case of GCS infection reported from a patient in our hospital. Group C streptococcal bacteremia appears to be a disease of elderly patients and those with significant underlying diseases, including cardiovascular disease, malignancy and immunosuppression (Bradley *et al*, 1991). In this case, the child had prolonged neutropenia due to aplastic anemia, which was probably the major contributing factor for this infection. The source of the sepsis was the pharynx, since the throat swab culture yielded the same organism, with a similar antibiotic sensitivity profile, as the blood isolate. Although some individuals with GCS infection have a history of exposure to animals (Salata *et al*, 1989; Bradley *et al*, 1991), this was not the case with our patient.

While it is unclear to what extent the infection contributed to the final outcome of the patient, GCS bacteremia is associated with a high mortality rate and other major sequelae (Bradley *et al*, 1991; Carmeli and Ruoff, 1995). Group C streptococci are known to produce a variety of extracellular products, including hyaluronidase, streptokinase, DNAase, streptolysin O, and probably a pyrogenic toxin similar to groups A and B, which may account for their virulence (Natoli *et al*, 1996). The usual antimicrobial agent used against group C beta-hemolytic streptococci is penicillin G (Natoli *et al*, 1996). The addition of aminoglycosides is generally synergistic and results in a bactericidal action. In our isolate, though no unexpected antimicrobial resistance was observed, the outcome was fatal. The case reported here illustrates the importance of GCS as a cause of serious infection among human beings, which should be more widely appreciated. The need to speciate beta-hemolytic streptococci and perform antimicrobial susceptibility testing is also stressed.

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