Group A streptococcal osteomyelitis: severe presentation and course

D Turner¹ and M Einhorn²

Pediatric Division¹, Shaare Zedek Medical Center, Jerusalem, Israel; Pediatric Infectious Disease Unit², Soroka University Medical Center and the Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel


Aim: To evaluate the course of group A streptococcal osteomyelitis associated with severe disease nowadays.

Methods: Three consecutive cases of severe group A streptococcal disease with osteomyelitis in children that were documented in Beer Sheva, Israel are described in detail.

Results: Two of the three cases were postvaricella. Early in the course of the disease, the presentation resembled that of severe cellulitis. All three patients had severe osteomyelitis and required surgery, and one patient developed chronic osteomyelitis. Sepsis was diagnosed in two cases.

Conclusion: Our cases are distinguishable from typical haematogenous staphylococcal osteomyelitis by the severe course and the extensive involvement of bone and soft tissues. The increase in severity of invasive group A streptococcal infections documented throughout the world could account for the difference between our complex cases and the previous reports.

Key words: Cellulitis, group A streptococcus, osteomyelitis, varicella complications

Dan Turner, Kfar Adumim, DN Mizrach Binyamin, IL-90618, Israel (Tel. +972 2 6555 542, e-mail. turnerjd@zahav.net.il)

The increasing incidence and severity of invasive group A streptococcus (GAS) infections have been reported since the mid-1980s, especially in association with varicella and among children (1–4). In several studies, it was found that osteomyelitis was a complication of more than 10% of the cases of GAS bacteraemia in childhood (1, 4). Nonetheless, GAS is an uncommon causative organism of osteomyelitis, isolated from less than 5% of the total cases (5–7). The well-known presentation and course of staphylococcal osteomyelitis may not apply to GAS, especially in an era of increasing severity of GAS infection. Case reports on the presentation, course and prognosis of GAS osteomyelitis are scarce and outdated (8–10) and do not reflect the increasing severity of GAS infections.

In order to re-evaluate the course of GAS osteomyelitis, we present the unusually complicated course of three consecutive patients with GAS osteomyelitis, hospitalized in the paediatric wards of the Soroka Medical Center, Beer-Sheva, Israel, during a two-year period (1997–1999).

Case report 1

A 19-mo-old infant, in his fourth day of varicella rash, was evaluated because of fever and left arm pain that lasted several hours, without local signs. During the next day, marked swelling developed along with diffuse tenderness and local warmth, extending from the left elbow to the hand. Typical varicella rash was noted but did not appear to be infected. White blood cell (WBC) count was 12 600/cm³ with 63% neutrophils and the erythrocyte sedimentation rate (ESR) was 59 mm/h. A technetium bone scan was consistent with osteomyelitis of the left proximal ulna. Following bone aspiration, which yielded bloody fluid, intravenous (IV) cloxacillin was initiated, which was replaced on the following day by a high dose of IV penicillin owing to positive cultures of GAS. Two days later, the fever had subsided and the swelling decreased. ESR was 97 mm/h and radiographs did not reveal any signs of osteomyelitis. The child was discharged on a daily intramuscular (IM) ceftriaxone regimen. On the tenth day of antibiotic
treatment, the patient was readmitted because of an aggravation of the swelling and erythema, in the mid-ulna area. An abscess was diagnosed and drained, but surgical exploration did not reveal bone involvement. On day 28 of illness, there was still tenderness and swelling over the mid-ulna; ESR was 55 mm/h. Radiographs showed osteomyelitis involving the entire length of the left ulna. Three weeks later, the arm appeared clinically well, with no tenderness; ESR was 19 mm/h but a CT scan was consistent with chronic osteomyelitis of the entire ulna (Fig. 1). Bone destruction was greatest at the ulnar mid-shaft, juxtaposed to the previously drained abscess. The patient received an additional six weeks of treatment with oral clindamycin, at the end of which a full recovery was noted.

Case report 2

A previously healthy, 15-wk-old baby boy was admitted to the paediatric ward because of suspected leg cellulitis, 6 d after the onset of varicella. On admission, the baby appeared septic, with compensated shock. Severe swelling and tenderness were noted above the left knee. WBC was 28650/cm³ with 65% neutrophils, haemoglobin was 7.4 g% and ESR 92 mm/h. A Gram stain of an aspirate from the left distal femur showed Gram-positive cocci in chains, and IV treatment with clindamycin and cefuroxime was initiated for the diagnosis of osteomyelitis. A CT scan showed diffuse oedema of the muscles consistent with myositis and fluid in the suprapatellar bursa, without periosteal reaction or signs of bone destruction. The following day, the swelling extended down to the left calf and erythema appeared above the knee. Surgical exploration in the area of the distal femur revealed 8 cc of pus in close proximity to the bone, but not in the subperiost, which was, however, necrotic. GAS grew from the aspirated pus and consequently therapy was changed to IV penicillin. A few days later, following clinical improvement, a large skin graft was used to close the surgical wound. The patient was discharged, feeling well, on a 6-wk course of daily IM ceftriaxone. Two weeks after discharge, radiographs showed an extensive periosteal reaction of the left tibia, with lytic lesions (Fig. 2); ESR was 30 mm/h. Full recovery was noted 6 mo later.

Discussion

The increasing incidence and severity of GAS infections throughout the world (1, 3) and in our medical center (2) possibly apply to GAS osteomyelitis as well. Only a few cases of GAS osteomyelitis have been described previously, all prior to 1990 (8–10). In contrast to these mild cases, the illness in our children was severe and complicated. Two children had compensated septic shock and all had a prolonged course of illness, despite early antibiotic treatment (one child developed chronic osteomyelitis, one required repeated surgery and one developed compartment syndrome). The increase in severity of invasive GAS infections could account for the difference between our complicated cases and the previous reports.

The accompanying aggressive swelling was unusual.
Mild swelling and erythema may develop in osteomyelitis but only after pus breaks through the cortex and therefore is localized preferentially to the area over the involved metaphysis (5–6). In contrast, in our cases, the swelling appeared shortly after the onset of pain and progressed rapidly to involve a large portion of the extremity. Most of the swelling could not be explained by accumulation of pus, as was revealed in the surgical explorations, pointing to concomitant soft-tissue infection. It is not clear from these cases whether the bone infection was a result of haematogenous spread. Case 1 is highly suggestive of spread to the bone by contiguity. The widespread bone disease and the localization of the maximal bone injury to the mid-shaft, rather than the metaphysis, are not readily explained by the conventional haematogenous model of osteomyelitis.

The clinical presentation of GAS myositis and necrotizing fasciitis can overlap or mimic cellulitis (11–12), as was the case early in the course of our osteomyelitis patients. Rapid development of the local inflammation, systemic toxic signs and underlying conditions, such as varicella, trauma or surgery, are important clues in identifying inflammatory processes caused by GAS rather than Staphylococcus aureus (13).

In summary, our cases of GAS osteomyelitis, associated with extensive soft-tissue involvement and sepsis, present an unusual form of osteomyelitis previously undescribed, which correlates with the increasing aggressiveness of the GAS organism. The early presentation of the disease was similar to that of other serious GAS infections such as necrotizing fasciitis (14). All of these infections require early diagnosis and vigorous treatment and should be suspected in any kind of GAS cellulitis that does not respond rapidly to treatment.

References

Received Feb. 14, 2002; revision received Aug. 6, 2002; accepted Aug. 21, 2002

Fig. 2. Plain radiographs of the left tibia of patient 3, showing extensive periosteal reaction with lytic lesions.