

## —Short Communications—

## Our Experience in Childhood Osteomyelitis

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Suppurative infections of bones and joints in children are not common, but they are important because of their potential to cause permanent disability<sup>1-3</sup>. In this report, the clinical and laboratory findings of 22 patients with osteomyelitis were reviewed retrospectively. Our purpose was to determine the etiologic agents and the clinical characteristics in childhood osteomyelitis.

The study includes 22 cases of osteomyelitis who were admitted to the Erciyes University Department of Pediatrics between 1982 and 1997. The diagnosis of osteomyelitis had to include clear evidence of bone involvement as well as evidence of infection, ie, fever, local signs, including erythema or warmth, and an elevated erythrocyte sedimentation rate (ESR)<sup>4</sup>. Of 22 patients, 13 (59%) were males, and nine (41%) were females, and the male/female ratio was 1.4/1. The patients' ages ranged from 3 years to 14 years (mean 9.1 ± 3.4 years); 4 (18.1%) younger than 5 years old; 10 (45.5%) aged 6 to 10 years; and 8 (36.3%) older than 10 years old. The most commonly observed symptoms were fever, joint swelling, arthralgia, bone pain and refusal to walk. A history of trauma was noted in 13 (59%) patients and local infection in one (4.5%). Eight (36%) patients received antibiotic therapy before admission to the hospital. Fever was noted in 17 (77%) patients. On laboratory investigation, hemoglobin levels ranged from 5.9 to 16 g/dl (10.6 ± 2.4 g/dl); anemia was observed in nine (40%) patients. White blood cell count ranged from 3,800 to 47,000/mm<sup>3</sup>; there was leukocytosis in 12 (54%) patients and leukopenia in two (9%) patients. Erythrocyte sedimentation

rate ranged from 19 to 140 mm/hour (74.5 ± 34.2 mm/hour). Three (13.6%) patients had only osteomyelitis, and 19 (46.3%) had osteomyelitis and arthritis. Osteomyelitis was diagnosed in a total of 27 bones (one patient had it in 5 bones, and the other had it in two bones). Arthritis was diagnosed in a total of 22 joints (one patient had it in three joints, and the other had in it two joints) (**Table 1**). The isolated microorganisms from joint fluid, blood and bone are shown in **Table 2**. Aside from osteomyelitis, broncopneumonia, pleurisy or pericarditis was particularly noted in some of the patients who were blood culture positive. Hospitalization ranged from 2.5 days to 83 days (39.2 ± 23.2 days). The mortality rate was 4.5%; one (the patient was developed severe *S. aureus* septicemia) of the 22 patients died, but postmortem examination was unremarkable. After discharge from hospital, 14 children were admitted as controls and they were found to be normal.

In children with osteomyelitis, fever, bone pain, limitation of joint movement, redness and swelling of the affected extremities are commonly observed<sup>1</sup>. Long bones are principally involved in osteomyelitis. It is also known that the femur and tibia are equally affected and together constitute almost half of all cases, and the bones of the upper extremities account for one fourth of all cases. Several bones or joints are infected in fewer than 10% of cases<sup>1,5</sup>. In our series, the most commonly observed symptoms were fever, joint swelling and arthralgia and the most affected bones and joints were the femur, tibia and knee. Two (9%) children had more than one infected bones and joints. These findings were in line with the literature data.

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Table 1 Distribution of affected bones and joints in our patients

Bones	Total bone (n : 27)	
	n	%
Femur	15	68.1
Tibia	7	31.8
Rib	3	13.6
Humerus	1	4.5
Mandible	1	4.5
Joints	Total joint (n : 22)	
	n	%
Knee	11	50
Hip	4	18.1
Ankle	4	18.1
Elbow	2	9
Interphalangeal joint	1	4.5

In osteomyelitis, *S. aureus* is the most common infecting organism in all age groups, including newborns. Group A Streptococcus is next in frequency but constitutes fewer than 10% of all cases. After 6 yr of age, most cases of osteomyelitis are caused by gram-positive cocci or *P. aeruginosa*. It is also noted that the *Pseudomonas* cases are related almost exclusively to puncture wounds of the foot<sup>1</sup>. In a series consisting of 135 children with osteomyelitis, bacteriologic causes were detected in 75 (55%) of the patients; *S. aureus*, *H. influenzae* type b, and *P. aeruginosa* were identified in 34 (25%), 16 (12%), and eight (6%) children, respectively<sup>4</sup>. In our study, joint fluid, blood and bone aspirate cultures were found to be positive in 68%, 50% and 40% children, respectively. The most commonly isolated microorganism was *S. aureus*, but no cultured *H. influenzae*, which was probably related to no child younger than 3 years old in our series. The children infected with *P. aeruginosa* was a 5-year-old and he had a positive trauma history.

A limited number of follow-up studies have shown that the age of the patient, the bone and/or joint involved, and the organism responsible all influence the long-term results in both septic arthritis and osteomyelitis. The poorest long-term prognosis is in the

Table 2 Distribution of isolated microorganisms from joint fluid, blood and bone

Isolated microorganisms from joint fluid	Total case (n : 22)	
	n	%
<i>Staphylococcus aureus</i>	13	59
<i>Staphylococcus epidermidis</i>	1	4.5
<i>Pseudomonas aeruginosa</i>	1	4.5
Isolated microorganisms from blood	Total case (n : 22)	
	n	%
<i>Staphylococcus aureus</i>	10	45.4
<i>Streptococcus pneumoniae</i>	1	4.5
Isolated microorganisms from bone	Total case (n : 22)	
	n	%
<i>Staphylococcus aureus</i>	9	40.9

neonate, especially where the hip joint is involved either alone or with a concomitant osteomyelitis<sup>6</sup>. In our study, one (4.5%) of 22 children died as a result severe *S. aureus* septicemia associated with osteomyelitis and arthritis. All children (a total of 14 case) admitted for control were found to be normal.

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