

Epidemiological and bacteriological study of chronic osteomyelitis

Abid A. Salman*

Ehan abidlhadi hussien**

Yonis A. Rasheed Al Radwani***

*Dept. of Community Medicine, College of Medicine- Tikrit University

**Dept. of Microbiology, College of Medicine- Tikrit University

***Dept. of Surgery, College of Medicine- Tikrit University

Abstract

Osteomyelitis in long bones remains challenging and expensive to treat, despite advances in antibiotics and new operative techniques. Plain radiographs still provide the best screening for acute and chronic osteomyelitis. Other imaging techniques may be used to determine diagnosis and aid in treatment decisions. In adults, *Staphylococcus aureus* is the most common organism isolated. A descriptive study was conducted on (25) patients with osteomyelitis, who were attending Orthopedics Clinic in Tikrit teaching Hospital during the period between 1st October year 2007 and 1st January year 2008. Epidemiological informations were obtained from the patients after diagnosis by clinical, X-ray, MRI and microbiological investigation. It has been documented that osteomyelitis cases were more frequent among male. Most of the cases having history of trauma (96%), Tibia bone is the more prominent site of infection and *Staphylococcus aureus* bacteria is the commonest causative pathogen. Tibia bone is the more prominent site of infection and *Staphylococcus aureus* bacteria is the commonest.

Keywords: causative pathogen, Osteomyelitis, epidemiology, risk factors.

Introduction

Osteomyelitis is defined as infection in bone. The root words *osteon* (bone) and *myelo* (marrow) are combined with *itis* (inflammation) to define the clinical state in which bone is infected with microorganisms(1), and also is defined as acute or chronic inflammation of bone, localized or generalized due to infection, usually by pyogenic organisms (2,3,4,5). A chronic form involving the long bones, especially tibia and femur, marked by a diffuse inflammatory reaction, increased density and spindle-shaped sclerotic thickening of the cortex, and an absence of suppuration (2).

The most important risk factors of osteomyelitis are trauma (primarily open fractures and severe soft tissues injury), vascular insufficiency, diabetes, elderly, children, obesity and surgical wound infection (6, 7, and 8). *Staphylococcus aureus* is the most common causative organisms, and other micro organisms like streptococcus (4% of cases), *E.coli.*, proteus,

Haemophiles influenzae type B and *Pseudomonas aeruginosa* (6,7,9,10,11).

The signs and symptoms related to osteomyelitis are pain in the bone, pus drainage on skin, malaise, fever, fatigue, sweating, weight loss and muscle spasm (3). Diagnosis of osteomyelitis depends on clinical features, X-Ray finding (bone lucency mixed with patchy sclerosis and adjacent periosteal new bone formation), MRI and confirmation of the diagnosis by blood culture and /or culture of a bone aspirate or biopsy. The management of osteomyelitis requiring pain relief, proper antibiotics, surgical decompression and removal of dead bone and lastly rehabilitation (11).

The aim of the study is to study the epidemiology and bacteriology of Osteomyelitis.

Patients and methods

A descriptive study was conducted on patients attending to Orthopaedic Out-

patient clinic in Tikrit Teaching Hospital during the period between 1st October 2007 and 1st January year 2008. The total number of patients who was diagnosed as cases with chronic Osteomyelitis, (25) patients. The personal characteristics information was obtained by questionnaire which includes all the questions regarding the epidemiology of the disease.

The Diagnosis depend on the signs and symptoms in addition to X-ray, MRI and confirming the diagnosis by staining by gram stain then culturing the bone aspirate or biopsy. After culture in blood agar and Mannitol media, gram stain was done to know the type of Gram positive organisms. *Staphylococcus aureus* appear on blood agar as large convex white creamy colonies while it show a yellow reaction in Mannitol agar media (8) while streptococcus appears as small pinpoint colonies and wide zones of beta haemolysis in blood agar . The Gram negative isolates cultured in MacConky agar ,E.coli will appeared as pink-red colonies while Proteus appear as clear colonies (lactose negative) (12). *P.aeruginosa* is non fermentative Gram-negative Bacilli which appear in blood agar as large, dull, gray colonies that are beta hemolytic typically have a "feathery edge" and may resemble ground glass (13).

Results

Table (1) shows that the distribution of osteomyelitis cases were more prevalent among age group (20-40 years old) (56%) and more among male (76%) than female.

Regarding the distribution of cases according to site of infection ,tibia bone represents the most common site 12 cases (48%) followed by femur bone ,8cases (32%) Fig.(1).

Fig.(2) show that (96%) of osteomyelitis cases have a history of trauma. *Staphylococcus aureus* bacteria was the most frequent isolated bacteria (44%) of cultures followed by Klebsella and *pseudomonas aeruginosa* (8% for each one) while (32%) of cases show no growth of bacteria Fig.(3).

Discussion:

The most frequent cases were among age group (20-40 years old, in contrast to other

studies in which that the cases were more frequent among elderly and paediatric age group (6, 7, 8). This result may be attributed to more exposure of adult and young to trauma as a result of violence in our community and also may be due to small size of study sample.

The present study reported that osteomyelitis were more frequent among males than females and this in agreement with study conducted in USA (14). This may be attributed that males are more prone to trauma and wounds which is one of the most important cause of inoculation bacteria in the wound (1).

The result revealed that the most common pathogenic organisms isolated was *Staphylococcus aureus*. This result in agreement with the most previous findings (15, 16).

The present study has been revealed that (96%) of cases have trauma history and this supports that trauma was one of the most important risk factors of osteomyelitis (6, 7, and 8).

Long bones (especially tibia) are more liable to osteomyelitis infection as reported by this study and this result is going with others findings (2).

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Table (1) Distribution of osteomyelitis cases according to age groups and gender.

| Age in year | Male | Female | Total | % |
|-------------|------|--------|-------|-----|
| <20 | 4 | 1 | 5 | 20% |
| 20-40 | 11 | 3 | 14 | 56% |
| 40-60 | 2 | 2 | 4 | 16% |
| >60 | 2 | 0 | 2 | 8% |
| Total | 19 | 6 | 25 | |
| % | 76% | 24% | 100% | |

Fig (1) Distribution of osteomyelitis cases according site of infection

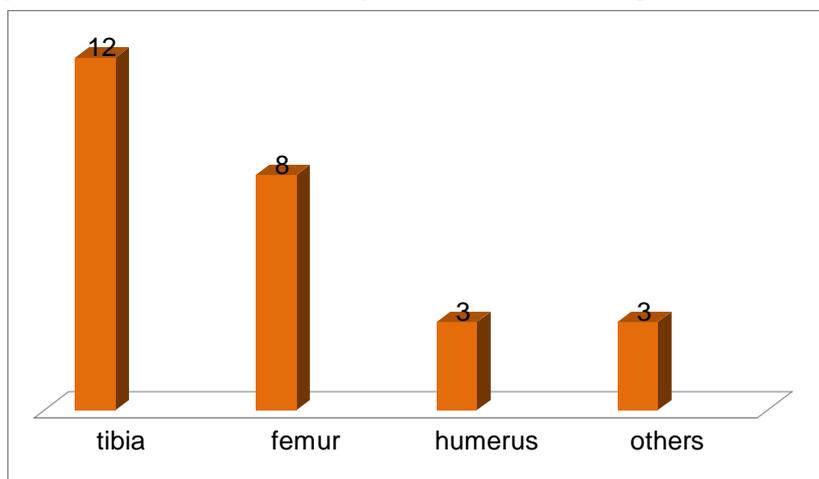


Fig (2) Distribution of osteomyelitis cases according to history of trauma.

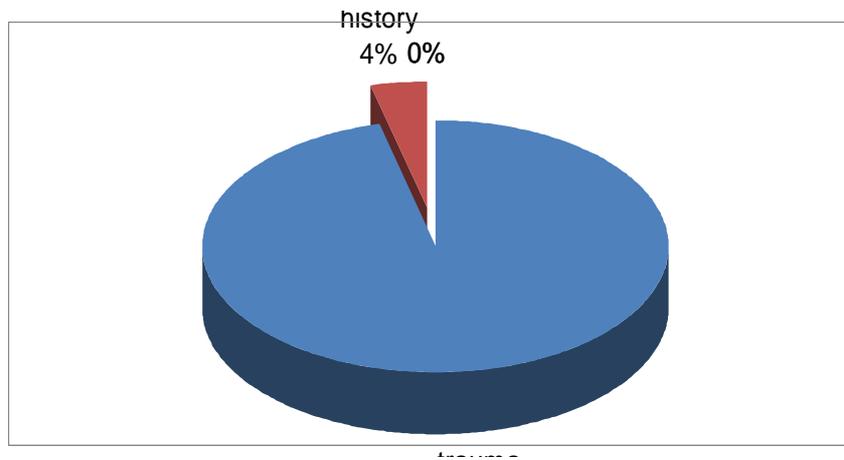


Fig (3) Distribution of osteomyelitis cases according to bacterial cultures

