ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 07 | July - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

# A STUDY ON CULTURE AND ANTIBIOTIC SENSITIVITY PATTERN IN CHILDREN WITH ACUTE OSTEOMYELITIS.

Orthopaedics

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## ABSTRACT

Osteomyelitis is strictly defined as any form of inflammation involving bone and/or bone marrow, but it is almost exclusively the result of infection.In children, osteomyelitis is primarily hematogenous in origin and acute in nature1. Acute osteomyelitis is defined as an infection diagnosed within 2 weeks of the onset of symptoms2.The principal cause of osteomyelitis in children is Staphylococcus aureus, and both the epidemiology and pathogenesis of S. aureus infections, including osteomyelitis, have changed in recent years owing to the emergence of community-associated methicillin-resistant S. aureus. It complicates antibiotic selection, and if not managed adequately, it results in amputation, sepsis, or death3.

## KEYWORDS

Acute osteomyelitis, pus culture , antibiotic, sensitivity.

## INTRODUCTION

Acute hematogenous osteomyelitis typically arises in the metaphysis of long tubular bones, with approximately two-thirds of all cases involving the femur, tibia or humerus [4]. While a variety of bacterial pathogens may be involved, S. aureus is the pre-eminent pathogen and is responsible for 70–90% of AHO infections in children . Other etiological agents, in no particular order, include Streptococcus pyogenes, Streptococcus pneumoniae, Group B streptococci (in infants), coagulase-negative staphylococci (especially in implant-associated infections), Kingella kingae, enteric Gram-negative bacilli (especially Salmonella spp. in individuals with sickle cell disease) and anaerobic bacteria. Haemophilus influenzae type b (Hib) was a common cause of childhood osteomyelitis, but its prevalence has been abated by introduction of the Hib conjugate vaccine . Organisms such as Mycobacterium, Bartonella, fungi (Histoplasma, Cryptococcus and Blastomyces[13].Candida and Coxiella are unusual causes of osteomyelitis, generally seen in patients with specific risk factors, most notably travel to or residence in geographic regions in which the offending pathogens are endemic and/or immunosuppression . It is also important to note that despite the increasing use of more sensitive diagnostic techniques that are less reliant on culture of the offending bacterium, most notably PCR, the etiology of AHO in children remains unknown in a significant number of cases[1].

**Image 1.**

**Image 2.**

**Study:**

This study was conducted in Bone And Joint Surgery Hospital to identify the etiological agents and their response to antibiotics for the development of adequate management policy of osteomyelitis. 50 children age 3 to 10 years admitted at Bone and Joint Surgery Hospital with Acute Osteomyelitis who underwent drainage and bone drilling were evaluated for pus culture reports and corresponding antibiotic sensitivity and resistance.Etiological agents were identified in most of the cases and antimicrobial susceptibility testing was performed.

**Table 1.**

| Organism | Sensitive | Resistant |
|---|---|---|
| MSSA | Amoxy-Clav, Amp-Salbactam[70%], Pipercillin-tazobactam, Amikacin, TicarcilineClav[80%],Cefoxitin,CeftriaxoneCefotaxime, Eratapenem,Imipenem,Meropenem, Linezolid[90%],Van | Penicillin Erythromycin Clindamycin |
| MRSA | Vancomycin[90%], , TMP-SMX[90%], Linezolid[90%], Ciprofloxacin/ Oflox/ Levoflox,Tetracyclin, Amikacin[70%] | AmoxyClav,Ampsalbactam,Cefuroxime,Cefoxitin,Deripenem,Ceftriaxone,Imipenem,Meropenem, |
| E.COLI | Piptaz[100%}, Ticarcillin Clav, Ceftriaxone[100%] | Ampicillin, Amoxycillin |

**Diagram 1.**

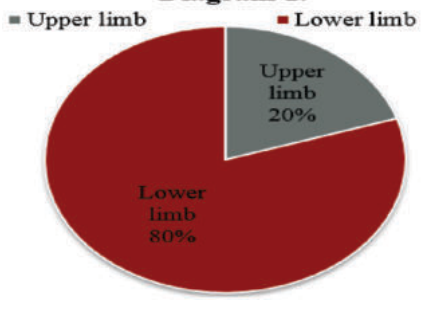


**Diagram 2.**

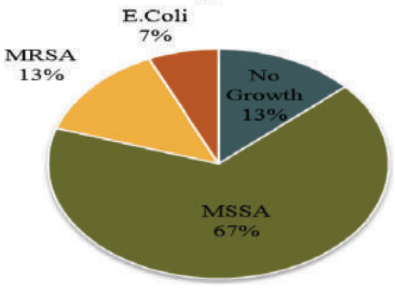
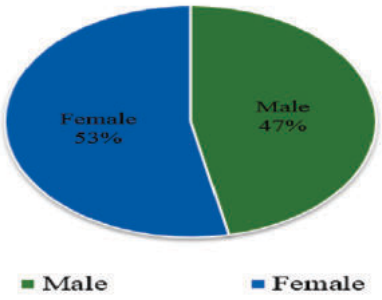



**Diagram 3.**




## RESULTS:

Majority of the cases involved lower limb 80% and upper limb accounting for 20% of cases(Diagram 1). 53% of the cases were females and 47% cases were males(Diagram 3). MSSA was the predominant pathogen detected in 67% of cases followed by MRSA and E.Coli 13% and 7% respectively with 13% of cases showing no growth(Diagram 2) .Majority of MSSA were sensitive to carbapenems, Pipercillin-tazobactam, linezolid and vancomycin, sensitivity remained almost same for linezolid ,vancomycin, tetracycline with significant decrease in sensitivity to carbapenems, amoxyclav and Ampbact in MRSA. 7% cases of E.Coli were both sensitive to Pipercillin-tazobactam and ceftriaxone and resistant to penicillin( Table1).

## CONCLUSIONS:

Penicillin with clavulanate is a good choice for imperial treatment along with Aminoglycosides and Carbapenems. Targeted antimicrobial therapy for MRSA with Vancomycin, TMP-SMX, Linezolid covers majority of such cases. E.Coli responds well to pippercillin and Tazobactam as well as ceftriaxone.

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