ORIGINAL ARTICLE

Frequency of Acute Osteomylitis in Children of Age Less Than Fifteen Years

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ABSTRACT

Aim: To find out the frequency of acute osteomylitis in children of age less than fifteen years with minor trauma with or without fracture.

Methods: This descriptive study was conducted from January 2015 to December 2016, in the Department of Orthopedic and Trauma Surgery of Hayatabad Medical Complex Peshawar on 60 consecutive patients. All patients having trauma to the limbs presenting to emergency department of age less than 15 years in either gender were included while patients with open fracture has been excluded from the study.

Results: There were total sixty patients in which 31(51.7%) were female and 29(48.3%) male. Age range was 9 with minimum age was 1 and maximum was 15±2.54 years. Upper limb was involved in 26(43.3%) while lower limb was involved in 34(56.7%) patients. Machanism of injury was fall in 52(86.7%), Motor vehicle accident 4(6.7%) and physical violence was 4(6.7%). Minor abrasions or bruise was present in 6(10%) while in 54(90%) patients it was not present. Fever was present in 7(11.7%) while 53(88.3%) pts were afebrile. Osteomyelitis was present in 48(80%) while absent in 12(20%) pts.

Conclusion: Acute osteomyelitis is very common in children and one should be more vigilant while treating a child with minor trauma with or without fracture.

Keywords: Blunt Trauma, Fracture, children, Osteomyelitis

INTRODUCTION

Acute osteomyelitis is more common in children of age less than fifteen year[1]. Acute osteomyelitis in children may be caused by either hematogenous spread or direct inoculation of bacteria[2]. Acute haematogenous osteomyelitis in children can be caused by infection elsewhere like chest infection[2]. This is a severe condition and delay in diagnosis and insufficient treatment may results in many sequelae like fracture, deformities and even septic arthritis[3]. So proper and prompt treatment is necessary for control of acute osteomylitis. To identify the bacteria causing the disease culture of the blood or bone biopsy is needed[4]. The common organism in children is Staphylococcus aureus and empirical antibiotic has to be started while awaiting the result of culture. In approximately 25% of cases the culture is negative[5]. Eradication or treatment of osteomyelitis due to methicillin-resistant Staphylococcus aureus is extremely difficult[6]. It quickly spreads with local tissue necrosis. It may cause deep venous thrombosis and septic pulmonary emboli. The most frequent site of infection are the lower limbs however thigh, arm, forearm and hand significantly develop septic arthritis[7].

Direct inoculation may be caused by trauma causing abrasions, lacerations or bruises or without any visible wound. Sometimes close fracture/ dislocation can cause acute osteomyelitis in children[8]. While a child presenting to an emergency department with minor trauma, he is overlooked for osteomylitis and only bandage or painkiller is prescribed to the patient. After few days the patient again comes with the complaints of pain, fever swelling and hot extremity which cannot be touched due to pain[9]. At this point the patient has developed acute osteomylitis and needs prompt management. It is of utmost importance to have a high index of suspicion for osteomylitis and one should be aware of the emergence of the strains that are antibiotic resistant and aggressive, which needs targeted treatment and careful monitoring[9].

Acute osteomyelitis can primarily be diagnosed clinically. The manifestations in acute osteomyelitis are fever, pain and tenderness over the affected area especially near the joints area. Investigations the clinical findings can be supplemented by laboratory investigation and radiological examination[10].

PATIENTS AND METHODS

This descriptive study was conducted from January 2015 to December 2016, in the Department of Orthopedic and Trauma Surgery of Hayatabad Medical Complex Peshawar on 60 consecutive

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patients. All patients having trauma to the limbs presenting to emergency department of age less than 15 years in either gender were included while patients with open fracture has been excluded from the study. All patients presenting to outpatient department or emergency department with history of trauma to the limb qualifying the inclusion and exclusion criteria was registered, was thoroughly examined and managed according to the protocol of ATLS. The purpose of the study was explained, written and informed consent was taken from all the patients. On registering the patient data (age, gender, site, mechanism of injury, abrasions, laceration, bruise, and deformity) Radiograph was done and fracture recorded. First follow up was done after one week second follow up was done after two weeks. Any evidence clinically or radiologically for acute osteomylitis was noted and prompt action was taken to treat osteomylitis. All the data was analyzed with the help of SPSS v17.

RESULTS

There were total sixty patients in which 31(51.7%) were female and 29(48.3%) male with mean 5.18±2.54 years (Table 1). Upper limb was involved in 26(43.3%) while lower limb was involved in 34 (56.7%) patients (Table 2). Left limb was involved in 26 (43.3%) while right limb was involved in 34 (56.7%) patients (Table 3). Mechanism of injury was fall in 52 (86.7%), motor vehicle accident 4(6.7%) and physical violence was 4 [6.7%] (Table 4). Minor abrasions or bruise was present in 6(10%) while in 54(90%) patients it was not present (Table 5). Fever was present in 7(11.7%) while 53(88.3%) patients were afebrile (Table 6). Osteomyelitis was present in 48(80%) while absent in 12(20%) of pts (Table 7).

Table 1: Frequency of gender (n = 60)

Gender	n	%
Male	31	51.7
Female	29	48.3

Table 2: Frequency of involved limb (n = 60)

Involved limb	n	%
Upper limb	26	43.3
Lower limb	34	56.7

Table 3: Frequency of side of involvement (n = 60)

Side of involvement	n	%
Left	26	43.3
Right	34	56.7

Table 4: Frequency of mechanism of trauma (n = 60)

Mechanism of trauma	n	%
Fall	52	86.7
Motor vehicle accident	4	6.7
Physical violence	4	6.7

Table 5: Frequency of minor abrasion/bruise over the limb (n = 60)

Minor abrasion/bruise over the limb	n	%
Yes	6	10.0
No	54	90.0

Table 6: Frequency of fever (n = 60)

Fever	n	%
Present	7	11.7
Not present	53	88.3

Table 7: Frequency of osteomyelitis (n = 60)

Osteomyelitis	n	%
Present	48	20.0
Not present	12	80.0

DISCUSSION

In children the periosteum is very rich vascular channel, just like the metaphysis near to the physis. In either region, nothing can stop bacterial dissemination to the bone in septicemia phase.[11] Inflammatory process in the periosteam and subsequent formation of subperiosteal abscess are probably more important than septic diffusion of intrametaphyseal region. Therefore involvement of bone would mainly concern the cortex, by an external periosteal route (direct blunt trauma to the bone) more than an internal metaphyseal route (haematogenous)[12].

In blunt trauma, etiological factors that cause pathogenesis of acute osteomyelitis involving the limbs, with subperiosteal abscess development which is most common, that considered 90 % of osteomyelitis locations involved the limbs.[13] The involved limb are the lower one which accounts about 70%[13] as compared to upper limbs while in our study upper limb was involved in 26(43.3%) while lower limb was involved in 34(56.7%) patients.

Blunt trauma has been considered as one of the cause of acute osteomyelitis. Rombouts[14] reviewed four publication[15-18] and has found the frequency of acute osteomyelitis of 40%, while in his own study it was 80% of the blunt trauma that caused acute osteomyelitis[14]. As compared to our study osteomyelitis was present in 48(80%) while absent in 12(20%) of patients. In our study 90% of blunt trauma has no abrasion or bruise. One study shows the frequency of Acute osteomyelitis of more than 63% caused by blunt trauma[19]. Any closed direct bone trauma may induce edema or hematoma in the subperiosteal space, facilitating bacterial seeding and development[19].

In one study 16% of cases had suspected entry point while in 63% cases with no entry point at initial blunt trauma were specified[20]. Fifty five percent of patients has positive blood culture at admission while 80% of patients has positive blood culture that are

associated with surgical drainage, the remaining 20% of patients had negative blood culture[20]. While in our study 10% of patients have minor abrasion and 90% has no abrasion or bruise.

In Sukswai et al[21] study, on presentation there was high temperature (> 37.5°C) in only one-third of newborns, one-half of infants and two-thirds of the older group while in our study less than one third have fever on presentation.

CONCLUSION

Acute osteomyelitis is very common in children and one should be more vigilant while treating a child with minor trauma with or without fracture. All children with minor trauma presenting to emergency department should be treated for osteomyelitis until proven otherwise.

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