

AETIOLOGY AND PATTERN OF BONE AND JOINT INFECTION PRESENTING AT A REGIONAL ORTHOPAEDIC HOSPITAL

Anyaehe UE, Lasebikan OA, Orikpe II, Eze KC, Ikpegbu TO

National Orthopaedic Hospital Enugu, Enugu State

ABSTRACT

BACKGROUND: Bone and joint infection is one condition that can either be rewarding, or a night mare to the surgeon. This work reports the causes and pattern of presentation of bone and joint infections in our sub region.

METHOD: A retrospective review of 73 cases of non granulomatous bone infection seen over two years from January 2012 to December 2013 was done. Patients' biodata, complaint, time to presentation in the hospital and if any intervention by the traditional bone setters, limbs involved, primary cause, diagnosis, organism cultured and retroviral status were obtained from the folders. Results: Commonest age group involved was in the second decade with 21.9%. Male to female ratio is 2.2:1. Chronic osteomyelitis was the commonest infection with 46.6% (34 patients) followed by septic arthritis with 26%. The lower limb was more involved than the upper limb with a ratio of 5.6:1. A significant number of patients 59 (80.8%) presented more than two weeks after onset of symptoms while 27 patients (36.9%) visited the traditional bone setters for treatment before presenting to the hospital. *Staphylococcus aureus* was the commonest organism isolated.

CONCLUSION: Chronic osteomyelitis is the commonest bone and joint infections in our environment mainly from trauma and closely followed by improperly treated haematogenous acute osteomyelitis. Acute osteomyelitis is a rare occurrence as late presentation and patronage of traditional bone setters is rife.

KEYWORDS: Bone infection, joint infection, aetiology

NigerJMed2017: 128-131
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INTRODUCTION

Bone and joint infection can be a surgeon's nightmare particularly in an environment where facilities are limited and patients present late after being mismanaged. In our sub region, facility for bone scanning is absent with few places offering both computed tomography (CT) scan and magnetic resonant imaging (MRI) and where available only few patients can readily afford the services as they finance their treatments via out of pocket expenses. Pyogenic bone and joint infections have been reported to result from haematogenous spread of bacteria or direct inoculation from contiguous focus of infection, traumatic injuries or as a complication of operative treatment of fractures.¹ Standard treatment for bone infections consists of thorough eradication and control of infection via different means which include antibiotics, radical debridement, bone grafting, bone

stabilization and soft tissue coverage depending on patient's presentation. Bone banks are not available in the country and bone graft substitutes though available, are still relatively expensive for most patients. Notwithstanding the availability of limb lengthening and bone transport procedures in some parts of the country, managing bone defects following bone infections remains a challenge to the surgeons because of the aforementioned limitations. A lot of patients present late and soft tissue defects become an additional problem to the surgeon. This work aims to review patients with bone and joint infection seen over a two year period in our sub region and determine the causes and pattern of presentation with a view to proffer preventive measures especially as diagnostic and treatment options are limited and cost of management expensive for most patients.

METHODOLOGY

It is a retrospective review of 73 cases of non granulomatous bone infection seen over two years from January 2012 to December 2013. Patient's biodata,

Corresponding Author: Dr. Orikpe Ikenna Ifeanyi
Dept. of Surgery,
National Orthopaedic Hospital, Enugu
orikpealkmuur@yahoo.co.uk
Tel: 08037410403

presenting complaints, time to presentation in the hospital, limbs involved, primary cause, diagnosis, organism cultured were extracted from the folders. All patients with bone and joint infections included in the study. Patients with non-bacterial infections and Mycotuberculous infections were excluded. Results analyzed with Statistical Product and Service Solutions version 20(SPSS 20). Ethical clearance was obtained from the hospital ethical committee.

Result

The age range is as shown in table 1. There were 50 males and 23 females with a male to female ratio of 2.2:1. Forty-six point six percent (34) of the patients were students followed by traders 23.3% (17), civil servants 6.8% (5), security officers 4.1% (3), farmer 2.7% (2), Teacher 1.4% (1), clergy 1.4% (1), driver 1.4% (1), electrician 1.4% (1), cattle rearer 1.4% (1) and remaining 9.6% (7) did not have their occupations recorded. Late presentation was rife as seen in table 2.

28 (37.8%) patients were first mismanaged by the traditional bone setters before presenting to our hospital. Discharging sinus was the commonest complaint followed by pain and swelling, inability to bear weight and deformity. Right lower limb was involved in 32 (43.8%) patients and the left in 31 (42.5%), right upper limb 4 (5.5%), left upper limb 6 (8.2%).

General summary of findings and diagnosis are shown in table 3. The aetiology of bone infection noted in this work was post traumatic seen in 32 (43.8%), haematogenous spread seen in 28 (38.4%) and post operative infection seen in 13 (17.8%). 97% of patients with post operative infection were either referred from private hospitals or the patients decided to leave the private hospitals where the surgeries were performed to our hospital being a regional Orthopaedic centre. 6.8% (5) of the patients had multiple site involvement. Organisms cultured are shown in Chart 1. 25.7% (19) of the patients had complications which include extensive soft tissue defects (3), Avascular necrosis of head of femur (3), bone loss/ gap (3), angular knee deformities (2), non union (3), knee stiffness (3), ankle stiffness, volkmanns ischaemic contracture with ulnar nerve palsy (1).

DISCUSSION

Bone and joint infections represent a huge burden to the health system and patients with respect to cost, recurrence, associated morbidity and complications, and functional impairment in some cases. The commonest age group involved in our study was in the 2nd decade of life with males approximately twice more affected than the females; these statistics are very similar to earlier studies conducted.^{1,2,3}

About 83.4% of our patients presented after 2 weeks of having the bone infection with 42.4% presenting one year after the infection had started. Late presentation is peculiar in our environment and this invariably affects outcome.

Significant number visited TBS first, complicating their condition. This pattern is a common finding in our environment.⁴ Our finding of 37.8% of patients visiting a traditional bone setter at the time of injury before presentation is close to the percentage of 47.1% of an earlier study conducted elsewhere in the country.⁵

Lower extremities being most commonly involved in bone infections^{6,7} is similar to our finding.

The most common cause of bone infections in our series was trauma(43.8%) similar to other studies,^{8,9} followed by haematogenous spread(38.4%) and post operative infection which in contrast to earlier studies done in the country, reported haematogenous spread/poorly treated acute osteomyelitis as the most common^{2,5}. Elachi et al reported no cases of osteomyelitis following operative treatment of fractures⁵. This difference is because majority of the patients that presented with post operative infection were treated in other hospitals from where they presented at our centre being a tertiary institution covering three geopolitical zones of the country.

The tibia was the most commonly involved site in chronic osteomyelitis as stated in other studies.^{2,5} There are opposing figures from studies done earlier in the country where the femur was the commonest site of chronic osteomyelitis^{10,11} This disparity can be attributed to the fact that trauma was the commonest cause in our series and the tibia is particularly prone to trauma¹²

Septic arthritis was most common in children in their 1st decade of life with haematogenous spread being most common aetiological factor which conforms to an earlier study done elsewhere in the country which revealed a mean age of 7.4yrs of 39 patients studied.³ In that study, the upper limb joints were more commonly involved in patients less than a year and lower limb joints more commonly involved in patients over a year old³. The knee joint was the most commonly involved in our study as documented in other series.^{3,13,14,15}

Staph aureus was the commonest organism isolated in our series (chart 1) similar to other works^{8,16} followed by coliforms which has been reported likewise in earlier studies.^{3,5} Staph aureus has selected virulence factors that enhance pathogenicity for osteomyelitis, including adhesions allowing attachment to bony

matrix and catalytic and proteolytic enzymes that allow compromise of the integrity of local structures and host immunity, promoting extension of infection into contiguous tissues.¹⁰

From the study it is imperative that public awareness on the need for early presentation at appropriate health facility for bone and joint trauma and infection be created. Acute osteomyelitis not presenting in the period of study is probably because they presented late when it had progressed to a chronic stage.

Table 1: Age range

Age group	Frequency	Percentage
0 – 10	11	15.1
11 – 20	19	26
21 – 30	14	19.1
31 – 40	12	16.4
41 – 50	7	9.5
51 – 60	3	4.1
>60	7	9.5
Total		100

CONCLUSION

Chronic osteomyelitis is the commonest bone and joint infection in our environment with the main aetiological cause being trauma closely followed by improperly treated haematogenous source. Acute osteomyelitis is rare. Late presentation and patronage of traditional bone setters is rife with this patronage of bone setters resulting in further complications.

We declare no conflict of interest.

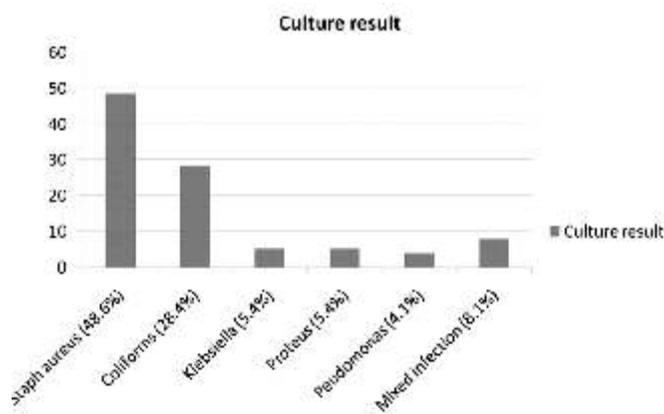
Table 2: Duration of complaint at presentation

	Frequency	Percentage
Valid		
0-<2 weeks	10	13.7
2 weeks to <1 Month	8	10.9
1 month - <6 Month	12	16.4
6 Month -<1 Year	10	13.7
1 year - <3 Year	16	21.9
3 years - <5 years	6	8.2
5 years and above	9	12.3
Total	71	97.1
Missing No Record	2	2.7
Total	73	99.9

Table 3: General summary of findings and diagnosis

Diagnosis	Chronic Osteomyelitis	Infected implant	Septic arthritis
	35 (47.9%)	19 (26%)	19(26%)
Most affected age group	11 -20 years	21 – 30 years	0 – 10 years
Commonest aetiological factor	Post Traumatic	Post operative	Haematogenous
Commonest organism isolated	Staphylococcus aureus	Staphylococcus aureus	Staphylococcus aureus
Commonest site of affectation	Tibia 17 (48.6 %)	Femur 9 (47.4%)	Knee joint 10 (52.6%)
Other sites	Femur 9 (25.7%) Metatarsals 4 (11.4%) humerus 3 (8.6%), forearm 2 (5.7%)	tibia 5 (26.3%), hip 2 (10.5%), radius 2 (10.5%), humerus 1 (5.3%)	hip 4 (21.1%), ankle 3 (15.8%), elbow 1 (5.3%) shoulder 1 (5.3%)

Chart 1: Culture result



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