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Bacteriological profile of osteomyelitis patients in government hospital, Ambikapur

Dr. Obulesu Gundala
Associate Professor in Microbiology at RSDKSGMC, Ambikapur, Surguja, Chattisgarh

Dr. Ramanesh Murthy
DEAN, Department of Microbiology at RSDKSGMC, Ambikapur, Surguja, Chattisgarh

Dr. Madhumita Murthy
Professor and HOD, Department of Anesthesia at RSDKSGMC, Ambikapur, Surguja, Chattisgarh, India

Dr. Parmanand Agrawal
Associate Professor in Anatomy at RSDKSGMC, Ambikapur, Surguja, Chattisgarh

Dr R. Salma Mahaboob*
Associate Professor in Biochemistry at RSDKSGMC, Ambikapur, Surguja, Chattisgarh
*Corresponding author

***Abstract*---**Osteomyelitis is an infection and inflammation of the bone. Bacteria are the primary cause of osteomyelitis. Infections with fungi and viruses can also cause it. It usually affects children and others who are immunocompromised. Although bacteria cannot colonise bone ordinarily, events such as trauma, ischemia, surgery, the presence of foreign particles, or the insertion of prostheses can disrupt bone integration, eventually leading to infection.AIM : To study Bacteriological profile of osteomyelitis patients in Government Hospital, Ambikapur. Material And Material : During the study period of April2021 to Oct 2021 for this study 30 patients who were diagnosed clinically and radiologically as a case of Chronic Osteomyelitis are participating in this study. The risk factors for Chronic Osteomyelitis were obtained from patient case sheets with the help of orthopedic surgeons in the department of orthopedic RSDKSGMC and Hospital.In this study, the total number of cases Chronic Osteomyelitis considered was 30.with age group of 1-60 years and both the sexs. CONCLUSION: Chronic osteomyelitis is a chronic

disease that affects the long bones, particularly the femur and tibia, and is most common in adults. Haematogenous Osteomyelitis is becoming less common as antibiotics become more widely available and children's growing bones have a higher vascular metaphysis. The most common organism causing Chronic Osteomyelitis in this study was Staphylococcus aureus.

Keywords---chronic osteomyelitis, enterococcus spp., streptococcus spp., pseudomonas aeruginosa.

Introduction

Osteomyelitis [1] is an infection and inflammation of the bone. Bacteria are the primary cause of osteomyelitis. Infections with fungi and viruses can also cause it. It usually affects children and others who are immunocompromised. Although bacteria cannot colonise bone ordinarily, events such as trauma, ischemia, surgery, the presence of foreign particles, or the insertion of prostheses can disrupt bone integration, eventually leading to infection. The most prevalent site for osteomyelitis is a long bone [2]. After bacteremia, hematogenous dissemination can lead to osteomyelitis [3]. Osteomyelitis typically begins as an acute infection, although it can progress to a chronic illness [4].

Osteomyelitis is classified based on the aetiology, pathophysiology, and degree of bone involvement, as well as the patient's age and immunological status [5]. S. aurous is the most common causal microorganism, but other infections such as Enterococcus spp., Streptococcus spp., Pseudomonas aeruginosa, Enterobacter spp., Mycobacterium spp., anaerobes, and fungi, particularly Candida spp., are less prevalent [6]. S. aureus causes both acute and chronic osteomyelitis by building a biofilm that rapidly acquires antimicrobial resistance and virulence factors, regardless of the immunological condition of the patient [7]. Surgical intervention is required in some cases to control the infection. Antimicrobial resistance causes a delay in treatment, which increases the risk of illness chronicity and periprosthetic infection [8].

The duration of treatment for acute osteomyelitis is 4-8 weeks. Osteomyelitis is uncommon in developed countries, but it does exist in poor countries, where morbidity is higher in lower socioeconomic groups [9]. Although the incidence of chronic osteomyelitis has decreased as a result of faster diagnosis, newer antibiotics, and modern treatment modalities, the rise of multidrug-resistant strains and the prevalence of predisposing conditions such as diabetes mellitus have made osteomyelitis a major problem [10].

Aim and Objectives

The present study was conducted to determine bacteriological profile of osteomyelitis and various epidemiological/risk factors associated with osteomyelitis.

Materials and Methods

The study was carried out in the department of microbiology, central laboratory RSDKSGMC and Hospital,Ambikapur, CG. study period**:** April2021 to Oct 2021. Observational Study covering bacteriological profile of chronic osteomyelitis and their antibiogram. The study was approved by the ethical committee of RSDKS GMC, Ambikapur, Surguja, C.G. with reference number 2390/GMC/2021/06-04-2021.

Materials

During the study period of April2021 to Oct 2021 for this study 30 patients who were diagnosed clinically and radiologically as a case of Chronic Osteomyelitis are participating in this study. The risk factors for Chronic Osteomyelitis were obtained from patient case sheets with the help of orthopedic surgeons in the department of orthopedic RSDKSGMC and Hospital.

Inclusion Criteria

All cases of chronic osteomyelitis with the following clinical features are included in this study

1. Prolonged history of disease present
2. Frequent flare up of infection occurs
3 Constitutional symptoms are absent
4. Occasionally bony spicules emerges out of the discharging sinus
5. Restricted neighbouring joint movement

Exclusion Criteria

The below cases were excluded from this study

1. Acute osteomyelitis cases
2. Tuberculous osteomyelitis
3. Osteomyelitis due to Anaerobic organisms

Sample Collection

The specimen included bone aspirate and bone curretings are plated under aseptic conditions in the ortho ward or in ortho operation theatre. Surface swabs are not included in this study.

Smear Preparation

After plating the bone aspirate, the residual pus is spread uniformly on a clean slide and allowed to air dry before being heat fixed by passing the slide through the flame 3-4 times. The smear is then stained with Gram's staining and examined under a 40x oil immersion microscope for pus cells and micro organisms.

Results

Each plate was evaluated after 16 to 18 hours of incubation for evenly semi-confluent growth and circular zones of inhibition around each disc. Using a zone scale that was held by flipping the Petri plate, the diameter of the zones of inhibition was measured. The Petri plate was illuminated with reflected light while held a few inches above a black, non-reflective background. During the study period of April2021 to Oct 2021 for this study 30 patients who were diagnosed clinically and radiologically as a case of Chronic Osteomyelitis are participating in this study. The risk factors for Chronic Osteomyelitis were obtained from patient case sheets with the help of orthopedic surgeons in the department of orthopedic RSDKSGMC and Hospital.

In this study, the total number of cases Chronic Osteomyelitis considered was 30.with age group of 1-60 years and both the sexs.

1. Haematogenous Osteomyelitis – 3 cases
2. Trauma patients without diabetes – 12
3. Postoperative patients without implants – 15

Bones involvement in Chronic Osteomyelitis

The involvement of long bones in Chronic Osteomyelitis is as follows

1. Femur – 46%
2. Tibia – 30%
3. Femur + Tibia – 4%
4. Tibia + Fibula – 6%
5. Radius+ Ulna – 8%
6. Humerus – 4%
7. Acetabulum – 2%

Table 01: Age & Sex Distribution of Chronic Osteomyelitis

S.No	Age Group	Male	Female
01	1-20	06	04
02	21-40	05	05
03	41-60	04	06
	Total	30	

Discussion

In this study occurrence of haematogenous osteomyelitis is only 6%. S.aureus was shown to be the most prevalent pathogen in haematogeneous osteomyelitis in this investigation, accounting for 66% (2/3 cases), which matches Lipsky et alfindings.[11] 's Haematogenous osteomyelitis is fully eradicated in developed countries, according to Lipsky. Staphylococcus aureus was found to be the primary causative agent in haematogenous osteomyelitis by Haider Abdul-Lateef Mousa et al (45.2 percent).[12, 13, 14] According to Haider Abdul-Lateef Mousa et al., males have an 84 percent prevalence of osteomyelitis, while females have a

16 percent prevalence. The male-female ratio is 5.25:1, while the female-female ratio is 1.9:1.

Conclusion

Chronic osteomyelitis is a chronic disease that affects the long bones, particularly the femur and tibia, and is most common in adults.Haematogenous Osteomyelitis is becoming less common as antibiotics become more widely available and children's growing bones have a higher vascular metaphysis. The most common organism causing Chronic Osteomyelitis in this study was Staphylococcus aureus.

References

1. Kumar Vinay, Abbas et al. Robbins basic pathology. Saunders Elsevier science. 2007;8;810–811.
2. Simpson W, Deakin M, Latham JM, Chronic osteomyelitis. J Bone Joint Surg.(BR). 2001;83-B:403-7.
3. Suguneswari G, Singh AH, Basu R.Bacteriological profile of osteomyelitis in a tertiary care hospital at Visakhapatnam, Andhra Pradesh. Int J Cur Res Rev. 2013;5(20):52-58.
4. Nada S H, Mark S. Expert Rev Anti Infect Ther. 2010;8(2):175–181.
5. Pineda C, Vargas A, Rodríguez AV. Imaging of osteomyelitis: Current concepts. Infect Dis Clin N Am. 2006;20:789-825.
6. Calhoun JH, Manring MM. Adult Osteomyelitis. Infect disbclin North Am.2005;19(4):765-86.
7. Gajdács M. The continuing threat of methicillin-resistant *Staphylococcus aureus*. Antibiotics (Basel). 2019;8(2):52.
8. Brady RA, Leid JG, Costerton JW, Shirtliff ME. Osteomyelitis: Clinical overview and
9. mechanisms of infection persistence. Clinical Microbiology Newsletter. 2006; 28(9):65-72.
10. Ikpeme IA, Ngim NE, Ikpeme AA.Diagnosis and treatment of pyogenic bone infections. African Health Sciences. 2010; 10(1):82-88.
11. Romano CL, Logoluso N, Elia A, et al. Osteomyelitis in elderly patients. BMC Geriatrics. 2010;10(1):1-2.
12. Lipsky BA, Berendnt AR:XVI Osteomyelitis. American College of physicians Medicine 2010,7 Inf Dis. XVI:1-20.
13. Haider Abdul-Lateef Mousa , MBChB , MSc*, Thamer A Hamdam, MBChB , FRCS **, Sundus S Bakr, BSc, PhD***, Clinical and Microbiology Evaluation of Osteomyelitis. Bahrain Medical Bulletin, Vol.23, No.2, June 2001.
14. Suryasa, I. W., Rodríguez-Gámez, M., & Koldoris, T. (2021). The COVID-19 pandemic. *International Journal of Health Sciences*, *5*(2), vi-ix. https://doi.org/10.53730/ijhs.v5n2.2937
15. Suryasa, I. W., Rodríguez-Gámez, M., & Koldoris, T. (2022). Post-pandemic health and its sustainability: Educational situation. *International Journal of Health Sciences*, *6*(1), i-v. https://doi.org/10.53730/ijhs.v6n1.5949