International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Methicillin Resistant Staphylococcus Aureus Bacteraemia with Spondylodiscitis, Prevertebral, Paravertebral and Epidural Involvement

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Abstract

Methicillin Resistant Staphylococcus Aureus (MRSA) is a highly virulent and antimicrobial- resistant strain of staphylococcus aureus. It is a notorious and leading cause of bacteraemia that commonly leads to dissemination of infection to various organ, more frequently in immunocompromised or elderly group. Spondylodiscitis and paravertebral involvement are among the rare but serious complications of MRSA bacteraemia. Early detection and high suspicion are key to early intervention and may significantly improves patient's prognosis. We report a case of 50 year old female with underlying diabetes mellitus, hypertension and end stage kidney disease who presented with infective gastrointestinal losses associated with lower back pain radiating to the lower limbs. Blood culture confirmed MRSA for which she was given intravenous vancomycin. MRI spine revealed T11, T12 infective spondylodiscitis with prevertebral, bilateral paravertebral and epidural extension, in favor of pyogenic infective process. Patient was managed by a multidisciplinary team of physician, orthopedic surgeon, nephrologist, physiotherapist and rehab medicine specialist. She was subsequently treated medically with daptomycin after autonomous decision from patient not for surgical intervention.

Introduction

MRSA remains as one of the most difficult to manage pathogens and it has been a global health challenge due to its resistance to multiple antimicrobial. It exhibits high rates of morbidity and mortality. [1] Clinical spectrum of MRSA involves a wide range of infection including, skin, soft tissue, bone, joints, and indwelling catheters or prosthetic devices associated infection. [2] Management of MRSA bacteraemia involves prompt identification of the strain and source of infection, proper choice of antimicrobial treatment, and robust prevention strategies.

Spondylodiscitis is the infection of vertebral bodies and intervertebral discs, one of the rare but lethal dissemination of MRSA bacteraemia. MRSA-related spondylodiscitis is associated with rapid progression and can lead to spinal instability, epidural abscess, or neurological compromise if not promptly diagnosed and managed. Incidence of disseminated has been increasing and this could be attributed to a myriad of factors mainly the aging global population, immunosuppressive illness (including diabetes mellitus, end stage kidney disease, autoimmune disease, and malignancy), and intravenous drug use. [3]

High index of suspicion especially in immunocompromised group is required as they may not have the classical symptoms and signs of sepsis. This may mislead and delay the actual diagnosis leading to poorer outcome. Diagnostic modalities such as MRI and CT are critical for detecting spinal and soft tissue involvement while blood culture help to confirm the infective microbial aetiology. [4]

Case Presentation

A 50 year old female with underlying of diabetes mellitus, hypertension and end stage kidney disease on regular haemodialysis via left arteriovenous fistula. She also had history of MRSA bacteraemia due to catheter related bloodstream infection with bilateral sternoclavicular joint (SCJ) septic arthritis and osteomyelitis 8 months ago, done operation and completed vancomycin. CECT thorax reassessment noted interval improvement of bilateral SJC septic arthritis.

She presented 2 weeks history of persistent loose stool, associated with fever, nausea, reduced oral intake, lower back pain and bilateral lower limbs weakness. At the time of presentation, she was conscious, vital signs showed BP 165/79, heart rate 86 beats per minute, temperature 38.5 degree Celsius, Spo2 99 under room air. On examination, abdomen was soft, nontender and no organomegaly. Neurological examination of the lower limbs revealed reduced power both right and left side 4/5. Sensory intact and normoreflexia. Cardiovascular and respiratory examination were unremarkable

Initial blood investigations showed WBC count of 11000/mm^3, normochromic normocytic anemia Hb9.1g/L and CRP of 33 mg/L. lumbosacral X ray [Figure 1] noted loss of lumbar lordosis and end plate erosion over T11-T12 with degenerative spine changes. Pelvic x ray [Figure 2] and chest x ray [Figure 3] were unremarkable

She was initially treated for infective gastroenteritis and degenerative spine disease. She was started on IV ceftriaxone 2g OD and septic workup was sent which subsequently turned out to have MRSA bacteraemia. Antimicrobial was then switched to IV vancomycin and serial therapeutic drug monitoring (TDM) had been shown to be within therapeutic range. Echocardiography showed no vegetation and ultrasound abdomen did not show evidence of intraabdominal collection.

MRI whole spine [Figure 4] noted T11/T12 infective spondylodiscitis with prevertebral, bilateral paravertebral and epidural extension, resulting in severe spinal canal narrowing and spinal cord compression, the appearance favour a pyogenic infective process. Degenerative hypertrophic changes involving the ligamentum flavum/facet joints at T9/T10 and T10/T11 causing spinal cord indentation, more pronounced at T10/T11.

Patient was counselled for surgical intervention however she did not consent for the procedure. She was subsequently managed with IV daptomycin. Patient remained afebrile throughout her stay and lower limbs power improving with physiotherapist. Septic parameters showed reducing WBC from 11000/mm^3 to 9000/mm^3 and CRP from 33mg/L to 14mg/L.



Figure 1



Figure 2



Figure 3



Figure 4

Discussion

MRSA bacteraemia is well known for dissemination to various organ systems. Hence it can present with a myriad of symptoms depending on the extent and sites of involvement. High index of suspicion and early identification of the causative microbes remain the key for better prognosis. Extra awareness is needed especially in patient who are relatively immunocompromised due to comorbidities including diabetes mellitus and end stage renal failure as in our presented case. While initial presenting complaint

of such patients may be rather nonspecific and misleading, the septic parameters may not be severely deranged as well in view of the underlying comorbidities. This often leads to delayed diagnosis and late initiation of the correct choice of antibiotics.

While spine X ray may raise early clinical suspicion for vertebral and spinal involvement, MRI spine remains the gold standard in diagnosing spondylodiscitis and vertebral collection. Surgical intervention is commonly recommended especially when there is evidence of neurological compromise, spinal instability or failure of medical therapy. One literature by Tali et al (2004) even suggested that early surgical decompression along with specific antibiotics is imperative in preventing permanent neurological damage. [5] In our case the patient refused for surgical intervention hence she was managed conservatively.

Extended parenteral antibiotics with good bone penetration is needed for MRSA bacteraemia with spondylodiscitis and vertebral collection. The baseline recommendation of 6 weeks duration from the infectious diseases society of America (IDSA) guidelines for native vertebral OM assumes that any substantial fluid collection or abscess has been successfully drained. If the paravertebral collection cannot be removed or if source control cannot be achieved, treatment is frequently extended to 8 weeks or longer to prevent relapse.

Conclusion

This case underscores the clinical presentation of MRSA bacteraemia with spondylodiscitis, prevertebral, paravertebral and epidural involvement particularly in a relatively immunocompromised patient with diabetes mellitus and end stage kidney disease. The need for high index of suspicion is imperative to avoid delayed diagnosis and enable early initiation of targeted antibiotics.

Acknowledgement

I would like to thank the medical department of Hospital Sultanah Nora Ismail Batu Pahat Johor, Malaysia for their support

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