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CASE REPORT

A Case Report on Anti-Microbial Resistance with Cellulitis

Prajwal D S [a, *], Safiya Anhar [a]

[a] Pharm D Intern, Department of Pharmacy Practice, Bapuji Pharmacy College, Davanagere, India.

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ABSTRACT

Introduction: The phenomenon of anti-microbial resistance poses a significant threat to global public health. The widespread and often inappropriate use of antibiotics has led for resistant strains of bacteria and other microbes, leading to concern for effective therapeutic options.
Case Report: A 49 years old male presented with the traumatic injury to his left foot by rod resulting in swelling and pain. Examinations revealed penetrating wound with cellulitis. Laboratory investigations with pus sample showed presence of non-fermenting, gram-negative bacilli resistant to a range of antibiotics. The patient was treated with antibiotics like Cefotaxime and Metronidazole, with analgesics like Tramadol and Paracetamol for 5 days, following which he was discharged with a comprehensive follow up plan.
Conclusion: This case highlights the growing problem of anti-microbial resistance in wound treatment. Doctors need to tailor a specific treatment plan based on the unique resistance profile of the bacteria. This case emphasizes the importance of improved monitoring for resistant bacteria in hospitals, collaboration between different specialists to tackle such complex wounds, and further research into new treatments to combat this growing threat.

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Introduction

Anti-microbial resistance (AMR) is a growing public health concern, with bacteria and other microbes developing the ability to resist the effects of antibiotics (Dickes et al., 2015). It is a growing concern, with over prescription, public demand for unnecessary antibiotics, and excessive use in animal food production being identified as key contributing factors (Ranaweera et al., 1999). This is often due to the overuse and misuse of antibiotics, leading to the adaptation of bacteria to grow in their presence (Wang et al., 2019). The emergence of multi drug-resistant strains of bacteria, such as Gram-negative and Gram-positive organisms has further complicated treatment (Sharma et al., 2005). This has led to a shortage of effective therapies and the need for the development of novel treatment options (Frieri et al., 2017). This problem is further exacerbated by the emergence and spread of resistant pathogens in various settings, including nursing homes, the community, and hospitals (Chen et al., 2009). The need for effective treatment options for these resistant pathogens is crucial, and further research is required to address this pressing public health issue. Non-fermenting gram-negative bacilli, such as Acinetobacter baumannii and Pseudomonas Aeruginosa, are increasingly associated with cellulitis and are often resistant to multiple antibiotics, including carbapenems. This resistance is often mediated by metallo-β-lactamases (MBL) and carbapenems, which can hydrolyze a wide range of antibiotics, making treatment challenging. The high prevalence of MBL-producing non-fermenting bacilli in cellulitis underscores the need for active surveillance and rapid detection methods to guide appropriate treatment and prevent

* Corresponding Author
Prajwal D.S.
E-mail: dsprajwal1999@gmail.com
Contact: +

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further spread of these resistant pathogens (Sahu et al., 2017; Tathe et al., 2016). We present a case of 49 year old male patient with cellulitis and multiple antibiotic resistances.

Case Report

A 49-year-old male presented with a traumatic injury to his left foot by a rod, resulting in swelling and pain. Initial treatment at a government hospital was followed by worsening symptoms, leading him to seek further care. The patient had no history of diabetes mellitus or hypertension. Examination revealed a penetrating wound with cellulitis, requiring referral to the orthopedics department for management. Upon presentation, the patient exhibited increased blood pressure and afebrile status. On local examination, the wound on the left lower limb included a 3x2 cm incised wound on the lateral aspect of the foot and a 2x1 cm incised wound on the medial side, with suturing done externally. X-ray findings showed no fractures or dislocations. Laboratory investigations were unremarkable, but pus samples revealed non-fermenting gram-negative bacilli resistant to certain antibiotics as shown in Table 1. Management included antibiotic therapy with Injection Cefotaxime, and analgesic Injection Tramadol, along with wound care consisting of MgSO4 dressing and foot elevation. Despite initial treatment, the patient required wound debridement to prevent further progression. Detailed treatment is shown in Table 2.

Table 1: Culture Report

Culture and Sensitivity	
Sample	Pus
Organism isolated	Non Fermenting Gram Negative Bacilli
Antibiotic Sensitivity	
Ampicillin	Resistant
Amoxycillin-Clavulanate	Resistant
Amikacin	Resistant
Ceftazidime	Resistant
Cefotaxime	Resistant
Ceftriaxone	Resistant
Ceftriaxone-Sulbactam	Resistant
Cefepime	Resistant
Ciprofloxacin	Resistant
Cotrimoxazole	Resistant
Cefazolin	Resistant
Gentamicin	Resistant
Imipenem	Resistant
Levofloxacin	Resistant
Meropenem	Resistant
Ofloxacin	Resistant
Piperacillin-Tazobactum	Resistant
Tetracycline	Resistant

Table 2: Treatment Chart

Brand name	Generic name	Dose	Frequency	D1	D2	D3	D4	D5
INJ TAXIMAX	Cefotaxime	1.5G	1-0-1	+	+	+	+	+
INJ PAN 40	Pantoprazole	40 MG	1-0-1	+	+	+	+	+
INJ EMSET	Ondansetron	4 MG	1-0-1	+	+	+	+	+
INJ TRAMADOL	Tramadol	50 MG IN 100 ML NS	1-0-1	+	+	+	STOP	
INJ METROGYL	Metronidazole	500 MG	1-1-1	+	+	+	+	+
INJ PCT	Paracetamol	1G	1-1-1	+	+	+	STOP	
INJ DIVON AQ	Diclofenac	75 MG	1-1-1	-	-	-	+	+

Discussion

The case report involves a 49-year-old male patient who presented with a traumatic injury to his left foot, leading to swelling and pain. Initially treated at a government hospital, the patient's condition worsened, prompting a visit to causality. The patient, with no history of diabetes or hypertension, exhibited increased blood pressure and localized wounds on the left foot. Diagnosis revealed a cell-penetrating wound of the left lower limb with cellulitis. Further examination showed incised wounds on the left lower limb and foot, with no evidence of fractures or dislocations on X-ray.

Laboratory investigations indicated resistance to a range of antibiotics, including Ampicillin, Amikacin, Ciprofloxacin, and others. The patient was found to be resistant to various antibiotics commonly used for such infections. Management involved antibiotic therapy with Injection Cefotaxime, and analgesic Injection Tramadol, along with wound care consisting of MgSO4 dressing and foot elevation. Subsequent wound debridement was performed to prevent further complications.

A study conducted to assess AMR found a high prevalence of multiple antibiotic resistant non-fermenting Gram negative bacilli in a hospital setting, particularly in the surgery department (Bhuvaneshwari et al.,2017). This highlights the need for improved surveillance and management to reduce contamination. Another study identified the presence of these bacilli, including Pseudomonas and Acinetobacter, in an intensive care environment (Speciale et al., 1982).

The case highlights the challenges posed by AMR in wound management and the importance of tailored treatment regimens. The identification of non-fermenting gram-negative bacilli and the resistance profile guided antibiotic selection. The management strategy focused on symptom improvement, wound care, and infection control to optimize patient outcomes.

Overall, this case emphasizes the significance of a multidisciplinary approach in managing complex wounds, especially in the context of antibiotic resistance. Tailored treatment regimens, wound debridement, and close monitoring are crucial in addressing such cases effectively.

Conclusion

This case on AMR shows the increasing threat of antibiotic resistance in treating wounds. The multi-drug resistant non-fermenting gram-negative bacilli infection in this patient led to common antibiotics being ineffective. This underscores the need for enhanced surveillance and infection control practices to curb the spread of resistant pathogens. Additionally, effective wound management requires a collaborative approach among physicians, microbiologists, and specialists. Finally, the development of novel therapies is crucial to combat the growing challenge of antibiotic resistance in wound care.

Conflict of interest

The authors declare that there is no conflict of interest.

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Declaration of patient consent

The authors declare that patient consent was taken for the publication.

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