



Klebsiella Pneumonia Necrotizing fasciitis: A critical infection in an uncontrolled Type 2 Diabetes Mellitus: A case Report

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ABSTRACT

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Klebsiella pneumoniae Necrotizing fasciitis (NF) is an emerging life-threatening condition, primarily affecting immunosuppressed patients, with poorly controlled diabetes mellitus being a significant risk factor. We present a case of a 47-year-old woman who initially presented with a dorsal skin boil under-treated with phytotherapy. Three weeks later, she developed severe and extensive Necrotizing fasciitis, and the bacteriological study isolated *Klebsiella pneumoniae*. The infection was promptly managed with surgical debridement, antibiotic therapy, and optimal glycemic control.

KEYWORDS:

Necrotizing fasciitis, *Klebsiella pneumoniae*, severe infection, Type 2 Diabetes mellitus

INTRODUCTION

Patients with diabetes are at high risk for skin and soft tissue infections due to end-organ damage from chronic uncontrolled hyperglycemia. Necrotizing fasciitis (NF) is a severe necrotizing soft tissue infection (NSTI) that leads to extensive necrosis of the subcutaneous tissue and fascia while sparing the muscle and skin, with potentially fatal complications. This makes NF a significant public health issue due to its high cost of management and elevated mortality rate. [1]

CASE REPORT

We report a case of a 47-year-old Moroccan female patient, known to have type 2 diabetes for 13 years. She presented with chronic imbalance, an HbA1c of 13%, without regular follow-up, and poor adherence to her insulin regimen (2 premixed injections). Her diabetes had been complicated for the past 6 years by diabetic retinopathy resulting in bilateral blindness and a diabetic right foot, which had been amputated.

The patient presented with a neglected dorsal skin boil, self-treated with medicinal plants: *Thymus vulgaris* and *Artemisia absinthium*, both known for their antimicrobial properties. Three weeks later, she presented in the emergency department with severe Necrotizing fasciitis (**Figure 1**), associated with a fever of 39°C, intense back pain, and diabetic ketosis.

Laboratory testing revealed leukocytosis with 14,500 cells/mm³, predominantly neutrophils, a CRP of 248 mg/L. A CT scan showed a 100x32 mm abscess collection in the dorsal soft tissues with no endothoracic extension.

Bacteriological study of the pus sample isolated a sensitive *Klebsiella pneumoniae* strain. The patient was promptly started on triple intravenous antibiotic therapy (Gentamicin, Ceftriaxone, Metronidazole) and managed with urgent surgical debridement (**Figure 2**), along with effective diabetes ketosis management leading to optimal glycemic control through rehydration and insulin therapy.

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Figure 1 : Upper dorsal Necrotizing fasciitis



Figure 2 : Surgical debridement of the Necrotizing fasciitis

DISCUSSION

Necrotizing fasciitis (NF) is a serious infectious process

characterized by necrosis of fascia, polymorphonuclear infiltrates, and edema of the reticular dermis, subcutaneous

Alahyane M. et al, *Klebsiella Pneumonia Necrotizing fasciitis: A critical infection in an uncontrolled Type 2 Diabetes Mellitus: A case Report*

fat, and superficial fascia. As the disease progresses, thrombosis of affected cutaneous perforators leads to devascularization of the overlying skin, causing rapidly spreading necrosis. This condition often progresses to systemic sepsis, toxic-shock-like syndrome, multi-organ failure, and delayed cutaneous necrosis.

In many cases, the causative organism cannot be isolated. The isolated flora from cultures of necrotic lesions is often polymicrobial, involving a mix of gram-positive bacteria (e.g., *Group A Streptococcus*, *Staphylococcus aureus*), gram-negative organisms (e.g., *Escherichia coli*, *Klebsiella pneumoniae*), and anaerobes (e.g., *Clostridium species*, *Bacteroides species*) [2].

Klebsiella pneumoniae (KP) is an opportunistic pathogen and a major cause of pneumonia, bacteremia, and urinary tract infections. It is known for its rapid progression to adjacent and distant body parts. In Necrotizing Soft Tissue Infections (NSTI), trauma or direct inoculation from superficial sites initiates bacterial seeding either by direct invasion or more commonly by hematogenous spread.

Once thought to be a copathogen in polymicrobial NF, *Klebsiella pneumoniae* is now emerging as a monomicrobial cause. Since the first case reported in 1996, *Klebsiella pneumoniae* has recently accounted for an average of 16% of NF cases, with a high mortality rate of 60% [3].

Diabetes, accounting for 76% of KP-NF cases, enhances susceptibility to *Klebsiella pneumoniae* colonization and infection. Type 2 diabetes mellitus (T2DM) impairs intracellular oxidative destruction of pathogens, neutrophil adhesion, chemotaxis, and cellular immunity. This leads to microthrombosis in small subcutaneous arterioles, which predisposes patients to infection.

The most common site of KP-NF in diabetic patients is the lower extremities. Isolated *Klebsiella pneumoniae* strains are generally sensitive to second and third-generation cephalosporins, aminoglycosides, quinolones, and carbapenems, which helps clinicians initiate appropriate Gram-negative antimicrobial therapy in severe NSTI cases. [4]

However, some cases of nosocomial or even community-acquired invasive *Klebsiella pneumoniae* infections have been observed, associated with disseminated infections and multiple organ abscesses affecting organs such as the liver, meninges, brain, and eyes [5]. Urgent surgical exploration with debridement and fasciotomies to completely remove necrotic tissue is essential to improving outcomes, reducing the mortality rate from 60% to 12% [6].

Phytotherapy is commonly used among diabetic patients in Morocco, with a predominance of type 2 diabetes (83.86%). However, it leads to adverse effects in 16.13% of cases, potentially delaying appropriate medical management of complications, including skin infections, even when using plants with antiseptic and antibacterial properties [7].

CONCLUSION

Neglected infections like necrotizing soft tissue infections (NSTIs) can progress rapidly, particularly in diabetic patients. *Klebsiella pneumoniae* is a significant pathogen in these cases. Prompt diagnosis, surgical debridement, and appropriate antibiotic therapy, along with optimal glycemic control, are crucial for effective management. The use of medicinal plants should be rationalized to avoid delays in managing potentially severe infections. Further research is needed to improve prevention and treatment strategies.

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