Case Report

Necrotizing Fasciitis Caused by a totally Drug Resistant Achromobacter Xylosoxidans Subspecies Xylosoxidans

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Abstract

Achromobacter xylosoxidans is an opportunistic environmental pathogen known to cause many serious infections. In recent years, there have been more number of reported cases of drug resistance with this organism. The choice of appropriate antibiotic and appropriate combination therapy are crucial to save lives of patients who contact this organism.

We report the Isolation and Identification of a rare emerging pathogen Achromobacter xylosoxidans sub species xylosoxidans resistant to all recommended antibiotics, in a 60 year old woman with Necrotizing fasciitis. The patient did not respond to combination therapy and finally succumbed to septicaemia, shock and death.

Our case report suggests the possible emergence of new pan resistant [totally drug resistant) pathogen - A. xylosoxidans.

Key words: Necrotizing fasciitis, Achromobacter Xylosoxidans, Drug Resistance.

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Introduction

Achromobacter xylosoxidans, formerly called Alcaligens xylosoxidans is a non –fermenting Gram negative bacillus of low virulence. This organism normally inhabits natural aquatic sources, human gut, as well as in hospital environment, and may cause both community acquired and nosocomial infections [1]. Invasive infection by this bacterium can lead to bacteraemia, with mortality rate ranging from 3% in adults to 80% in neonates [2]. Catheter associated bacteraemia, urinary tract infections, post-operative wound infections, meningitis, endocarditis , hepato biliary infections , and skin and soft tissue infections are reported [3]. Some of these studies reported resistance of the organism to many drugs [4]. Increasing trends of drug resistance are observed since the last two decades [5].

Case Report

A 60 year old woman, who works in paddy fields was admitted to our hospital with cellulitis of left leg developed after an insect bite. Surgical debridement was done under empiric antibiotic coverage, and samples of the tissue were sent for culture and sensitivity. Gram negative, non-fermenting, oxidase +ve, citrate +ve, motile bacilli was isolated and identified as Pseudomonas species . AST was performed by standard Kirby- Bauer disc diffusion method. The organism was resistant to all anti – pseudomonal drugs like Gentamycin, Amikacin, Ciprofloxacin, Piperacillin, Ceftazidime, Piperacillin/ Tazobactam, Meropenem (fig- 1). The surgical profile of the patient was normal; she was immuno competent and non-diabetic. Patient was switched over to combination therapy of Imipenem & Tobramycin infusions, but the lesion progressed. Second and third aggressive surgical debridement's (fig 2) were done and the samples yielded the same single pathogen on repeated isolation. Meanwhile at the time of intramuscular injection the surgeon noticed a large gluteal abscess (fig- 3), that was drained and the pus was sent to microbiology laboratory for culture and sensitivity. The gluteal pus also yielded the same organism with the same drug resistance pattern as that isolated from cellulitis. The two isolates from both the sites [lower leg necrotized tissue and gluteal abscess] were sent for Vitek 2 auto system (bioMerieux),which reported the organism as Achromobacter xylosoxidans

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sub species xylosoxidans, and MIC values for all the recommended drugs namely amikacin, cefepime, cefotaxime, ceftazidime, ciprofloxacin, gentamicin, imipenem, levofloxacin, meropenem, mezlocillin, piperacillin, piperacillin/tazobactam, tetracycline, tobramycin, trimethoprim/sulfamethoxazole and colistin (tab- 1) as per the standards of the National Committee for Clinical Laboratory Standards. Patient's clinical condition deteriorated further and ended up in bacteraemia and septic shock .Blood cultures yielded the same organism and the patient died two months after her admission into the hospital.

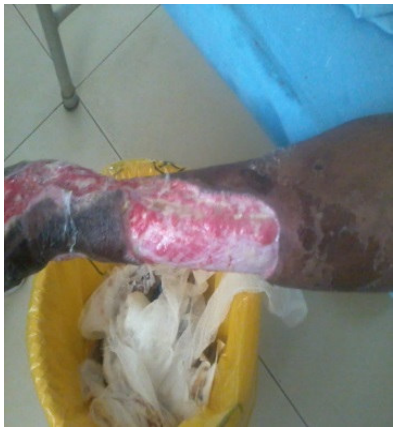

Figure 1: Necrotizing Wound of Lower Leg after Surgical Debridement

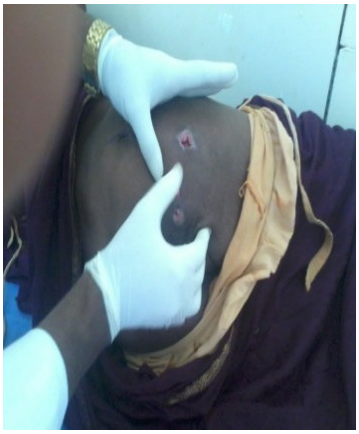

Figure 2: Gleuteal Pus Drainage with Multiple Incisions

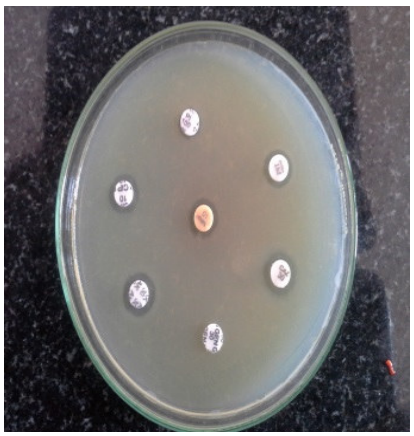

Figure -1: Antimicrobial Sensitivity Test by Kirby – Bauer Method Showing Total Drug Resistance

Discussion

Achromobacter xylosoxidans is found in aquatic environment and is an emerging pathogen which is mostly drug resistant [1]. The organism is usually susceptible to anti – Pseudomonal penicillins, carbapenems & trimethoprim/ sulfamethoxazole [5].

Mortality is high in invasive infections caused by this organism and the clinical presentations are diverse [1].

Trivial trauma like an Insect bite, burn or a superficial cut can lead to necrotizing fasciitis [6]. Common organisms that can cause fasciitis are Group A Streptococcus, Staphylococcus aureus, Clostridium perfringens, Bacteroides fragilis, Aeromonas,Vibriospecies, E.coli, Kliebsiella & Pseudomonas, and A. xylosoxidans is rarely incriminated [7].

Necrotizing fasciitis is a rapidly spreading infection located in fascial planes of connective tissue that results in tissue necrosis.

The non-fermenting, Gram negative bacilli that are infrequently isolated in clinical microbiology laboratories face a delay in identification and add to the diagnostic dilemma because of their saprophytic nature. Often they are overlooked as contaminants or wrongly identified as Pseudomonas species [1]. 85% of Necrotizing fasciitis cases are polymicrobial in origin , and only in 15% of cases, the infection is monomicrobial [8] .In our case, A.xylosoxidans was isolated as a single pathogen , repeatedly and from different areas of the patient's body and finally from blood. Usually A. xylosoxidans is a pathogen of low virulence, but the extended or total drug resistance further complicated the prognosis in the present case. The presence of A. xylosoxidans in the wound, either as a coloniser or as a single significant pathogen might lead to invasive infections that could be fatal [4].

Conclusion

Our case report adds to the knowledge about the clinical spectrum of infections caused by this rare but important emerging pathogen, Achromobacter xylosoxidans.

This organism needs further study, and may not be overlooked henceforth as just environmental contaminant. Role of demography in patient's history has to be emphasized and correlated.

A person infected by this totally drug resistant organism is likely to present as a medical emergency that often leads to death or disability if not promptly and effectively treated.

Table 1: Minimum inhibitory concentration report by vitek 2 autosystem showing total drug resistance

Drug	Mic	Interpretation
1. Amikacin	>32	R
2. Amoxyclav	>16/8	
3. Ampicillin	>16	
4. Cefazolin	>16	
5. Cefepime	>16	R
6. Cefotaxime	>32	R
7. Cefotaxime Clavulanate	>2	
8. Cefuroxime	>16	
9. Ciprofloxacin	>2	R
10. Colistin	4	
11. Ertapenem	>4	
12. Fosfomycin	<=32	
13. Gentamicin	>8	R
14. Imipenem	>8	R
15. Levofloxacin	>4	R
16. Meropenem	>8	R
17. Mezlocillin	>64	R
18. Moxifloxacin	>1	
19. Nitrofurantoin	>64	
20. Norfloxacin	>8	
21. Piperacillin- Tazobactam	>64	R
22. Piperacillin	>64	R
23. Tetracyclin	>8	R
24. Tobramycin	>8	R
25. Trimethoprim – Sulfamethoxazole	>2/38 >8	R

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