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Case Report

Extreme Antibiotic Resistant *Acinetobacter baumannii*-Related Pneumonia in a Regional Hospital

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Most nosocomial infections have been attributed to nonfermenters, particularly *Acinetobacter baumannii* which causes serious infections like pneumonia, meningitis, and sepsis. The purpose of this study was to report our experience with five cases of *A. baumannii*-related pneumonia infections, seen in a regional hospital, Karaj, Iran. Five cases were identified as having *A. baumannii*- related pneumonia infection. All cases had been treated previously with various antibiotics at time of diagnosis. The treatment of *A. baumannii*- related pneumonia infection in all the cases varied. But unfortunately, all the five cases died from severe *A. baumannii*- related pneumonia and severe sepsis. Our cases brought forth the burden of *A. baumannii*-related pneumonia infections associated with significant mortality. Physicians should be aware of the remarkable virulence and antibiotic resistance.

Key words: Acinetobacter, Pneumonia, Antibiotic resistant

1. Background

Hospital-acquired infection is an additional problem for the patient who has been admitted to a clinical setting for some serious illness. This infection is caused by pathogens like *Acinetobacter baumannii* (AB) which are prevalent in hospital environment (1). *A. baumannii* has emerged as an important pathogen which has received a great interest during the last two decades (2, 3). These bacteria are etiologic agent of various infections, particularly pneumonia; therefore, they represent an emergent public health problem. Furthermore, such infections are challenging to treat because of extensive antimicrobial drug resistance (4-6).

The purpose of this study was to report our experience with five cases of *A. baumannii*-related pneumonia infections, seen in a regional hospital in Karaj, Iran. The bacterium was isolated and identified based on standard procedures. Similarly, all the isolates were tested for their antibiotic susceptibility based on Clinical and Laboratory Standards Institute (CLSI) guideline (7).

2. Context

2.1. Case 1

The first case was a 72-year-old woman admitted to the hospital due to loss of consciousness and recognition of Cerebra Vascular Accident and transferred to the intensive care unit (ICU). The patient's history revealed multiple brain infarctions. Unfortunately, chest radiograph revealed that patient has developed cardiomegaly.

Upon admission, she was empirically initiated on intravenous (IV) meropenem (1 g/ day). On Day 12 of admission, pulmonary secretion was increased; therefore, she was suctioned and intubated. On Day 13, chest radiograph revealed nothing; however, sputum cultures grew *Klebsiella spp*. On Day 18, as pulmonary secretion was continued, sputum culture revealed *A. baumannii* which was confirmed by the reference laboratory. On Day 19, Clindamycin was added to patient treatment protocol. On Day 20, treatment was started with colistin. The patient was isolated, and on Day 22, she had a cardiac pulmonary arrest, finally on Day 24, she died.

2.2. Case 2

An 87-year-old man was presented to emergency department with loss of consciousness. After the primary check up by physicians, it was revealed that the patient suffered from a broken leg and was bed sore. Patient was found to have right hemiparesis.

On the fifth day of hospitalization, he developed pneumonia, and antibiotic regimen was started with amikacin and cefipenum. In Day 8, the patient experienced loss of consciousness. On Day 9, pulmonary secretions culture revealed *A. baumannii,* and antibiotic treatment started with meropenem and vancomycin. However, antibiotic treatment was changed to colistin and amikacin. On Day15, the patient was discharged with personal satisfaction, but unfortunately, patient died on Day 17.

2.3. Case 3

A 67-year-old man was presented to the emergency department due to imbalance and right hemiparesis. Patient was admitted to ICU. In patient's history, it was revealed that he had a hip replacement, hernia, and drug addict.

The patient underwent craniotomy and hematoma evacuation and was admitted to SICU. After surgery, the patient was treated with Ceftriaxone and vancomycin. On the seventh day, the patient developed respiratory distress and

fever, followed with cultivation of respiratory secretions, and treatment was started with Meropenem and Amikacin.

On the tenth day of admission, culture of respiratory secretions was positive for *A. baumannii,* and antibiotic therapy was changed to colistin and amikacin. On the thirteenth day of admission, patient suffered from bradycardin and eventually died because of cardiopulmonary arrest.

2.4. Case 4

A 71-year-old woman with loss of consciousness and right sided hemiplegia, who was admitted to the ICU, diagnosed with stroke. Heart valve replacement and stroke was the patient's history. Chest X ray revealed that the patient had a heart failure and pulmonary edema. Based on consultation and review of the patient's lung, we diagnosed the pneumonia, and treatment with Ceftriaxone and Clindamycin was started. In Day 3 to 6, patient's respiratory sections were increased, and cultivation was done. The result of cultivation was positive for *A. baumannii,* and antibiotic treatment was changed to colistin. The patient's general condition worsened, Meropenem and vancomycinwas added to the treatment regimen. On Day15 the patient's sputum culture was done, and growth of *A. baumannii* was confirmed. On Day 17, Patient died.

2.5. Case 5

Case 5 was a 69-year-old man with loss of consciousness, stoke, diabetes and dementia which referred to ICU. On the arrival time to the hospital, patient had wound bed also. During the length of hospital stay, patient was put with line of central venous pressure; however, patient on Day 5 suffered from breathing problems, and therefore, patient was intubated. Respiratory sections were cultured on Day 13 and revealed *A. baumannii*. On Day 24, patient was treated with colistin; however, unfortunately, patent died on Day 29.

3. Discussion

Recently, an alarming increase in infections caused by antibiotic-resistant pathogens, including *Acinetobacter* spp., has been observed, particularly in intensive care units (8).

The five cases observed during the study period represented the burden of *A. baumannii* which killed 5 patients in our hospital. To the best of our knowledge; this was the first *A. baumannii* unsuccessful treatment in Karaj. Therefore, infection due to *Acinetobacter* species has posed considerable challenges. Based on this and increasing prevalence of *A. baumannii* in our hospital, new infection control procedures to limit *A. baumannii* to a related infection was established.

All the *Acinetobacter* infections reported here reflect the burden of nosocomial *Acinetobacter* infections, which occurred in patients with high risks such as extremes of age. As others reported, the difficulty intreating *Acinetobacter* infections is not due to any excessive virulence of the organism but rather to its antibiotic resistance pattern (9, 10). However, *A. baumannii*is known to cause pneumonia, and it is associated with mortality as high as 69% (11, 12); therefore, prompt diagnosis is crucial. Like our study, many studies were limited by small sample sizes, methodological differences, and failure to adequately control patients' severity of illness. Furthermore, many scientists believe that *Acinetobacter* infection is a marker of increased mortality in this kind of patients with severe illness (13, 14). Of these scientists many reported that mortality may be related to the extent of antimicrobial resistance and the effectiveness of empirical therapy; however, other studies have found poor correlation between patient mortality and the empirical choice of antimicrobial agents to which *Acinetobacter* infection was resistant (15).

Despite of ever-increasing population of hospitalized patients with *Acinetobacter pneumonia* infections, the entity described here has not been reported earlier. Based on this, rapid diagnostic tests were developed to allow for early recognition and prompt initiation of appropriate antibiotics. Above this, local relevant guidelines were developed to improve the outcomes of patients with *Acinetobacter* pneumonia infections.

Finally, as others also believe that *Acinetobacter* infections are very difficult to treat; they also believe that the prevalence of drug-resistant strains is increasing, and treatment options are increasingly limited. Therefore, we suggest, that effective therapy may need to be the use of combination therapy.

4. Conclusion

Our cases brought forth the burden of *Acinetobacter baumannii*-related pneumonia which has been associated with significant mortality, and as illustrated in our cases, infection with *A. Baumanni i*can be rapidly fatal, stressing the importance of reporting of *A. baumannii* isolates in cases of pneumonia. Physicians should be aware of the remarkable virulence and drug resistance.

Conflict of Interests

All authors have nothing to declare and have no potential conflict of interests.

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Conflict of interest

We have no conflict of interest related with this study.

Authors' Contribution

Enayatollah Kalantar, written the manuscript, Ali Kurd, helped in gathering the data, Kourosh Kabir, analyzed the results, Parviz Afrogh and Sara Mohammadi, collected the data, Mohammad Hadi Naseh, handelled the meeting and helped in manuscript writing.

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References

1. Chang HL, Tang CH, Hsu YM,Wan L, Chang YF, Lin CT, et al. Nosocomial outbreak of infection with multidrug-resistant *Acinetobacter baumannii* in a medical center in Taiwan. Infect Control Hosp Epidemiol. 2009; 30(1): 34–8.
2. Kokkonouzis I, Christou I, Athanasopoulos I, Saridis N, Skoufaras V. Multiple lung abscesses due to acinetobacter infection: a case report. Cases J. 2009; 2:9347.
3. Rana MA, Rahman BA, Mady A, Odat MA, Alharth A, Ramadan Oel S, et al. Intra-pleural colistin than esulfonate therapy for pleural infection caused by carbapenem-resistant *Acinetobacter baumannii*: a successful case report. Infect Dis Rep. 2014; 6(3): 5413.
4. Manchanda V, Sanchaita S, Singh NP. Multidrug Resistant *Acinetobacter*. J Glob Infect Dis. 2010; 2(3): 291-304.
5. Sullivan DR, Shields J, Netzer G. Fatal case of multidrug resistant *Acinetobacter baumannii* necrotizing fasciitis. The American Surgeon. 2010; 76(6): 651–3.
6. Feizabadi M M, Fathollahzadeh B, Taherikalani M, Rasoolinejad M, Sadeghifard N, Aligholi M, et al. Antimicrobial susceptibility patterns and distribution of blaOXA genes among Acinetobacter spp. Isolated from patients at Tehran hospitals. Jpn J Infect Dis. 2008; 61(4): 274-8.
7. Wayne, PA, USA: Clinical and Laboratory Standards Institute (CLSI). M100-S21: Performance standards for antimicrobial susceptibility testing. 2012; 32. 21st Informational Supplement.

8. Tsakiridou E, Makris D, Daniil Z, Manoulakas E, Chatzipantazi V, Viachos O, et al. *Acinetobacter baumannii* infection in prior ICU bed occupants is an independent risk factor for subsequent cases of ventilator-associated pneumonia. Biomed Res Int. 2014: Article ID 193516.
9. Nhu NTK, Lan NP, Campbell JI, Parry CM, Thompson C, Tuyen HT, et al. Emergence of carbapenem-resistant *Acinetobacter baumannii* as the major cause of ventilator- associated pneumonia in intensive care unit patients at an infectious disease hospital in southern Vietnam. J Med Microbiol. 2014; 63: 1386–94.
10. Ayraud-Thevenot S, Huart C, Mimoz O. Control of multi-drug-resistant *Acinetobacter baumannii* outbreaks in an intensive care unit: feasibility and economic impact of rapid unit closure. J Hosp Infect. 2012; 82(4): 290–2.
11. Davis JS, McMillan M, Swaminathan A, Kelly JA, Piera KE, Baird RW, et al. A 16-year prospective study of community-onset bacteremic *Acinetobacter* pneumonia: low mortality with appropriate initial empirical antibiotic protocols. Chest. 2014; 146(4): 1038-45.
12. Principe L, D'Arezzo S, Capone A, Petrosillo N, Visca P. In vitro activity of tigecycline in combination with various antimicrobials against multidrug resistant *Acinetobacter baumannii.* Ann Clin Microbiol Antimicrob. 2009; 8:18.
13. Chaari A, Mnif B, Bahloul M, MahjoubiF, Chtara K, Turki O, Gharbi N,Chelly H, Hammami A, Bouaziz M. *Acinetobacterbaumannii* ventilator-associated pneumonia: epidemiology, clinical characteristics, and prognosis factors. Int J Infect Dis. 2013; 17(12): e1225–8.
14. Joung MK, Kwon KT, Kang CI, Cheong HS, Rhee JY, Jung DS. Impact of inappropriate antimicrobial therapy on outcome in patients with hospital-acquired pneumonia caused by Acinetobacter baumannii. J Infect. 2010; 61(3): 212–8.
15. Falagas ME, Kasiakou SK, Rafailidis PI, Zouglakis G, Morfou P. Comparison of mortality of patients with Acinetobacter baumannii bacteraemia receiving appropriate and inappropriate empirical therapy. J Antimicrob Chemother. 2006; 57(6): 1251–4.

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