Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2017; 5(10B):3917-3919 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublishers.com DOI:10.36347/sjams.2017.v05i10.023

Nosocomial Multidrug-Resistant Acinetobacter Baumannii Meningitis: Two Cases Study

Zahidi J*, Ait Said L, Warda K, Zahlane K
Microbiology Department, Ibn Tofail Hospital, Marrakesh, Morocco

Case Report

***Corresponding author**
Zahidi J

Article History
Received: 05.10.2017
Accepted: 16.10.2017
Published: 30.10.2017

Abstract: Acinetobacter baumannii is a frequent agent of nosocomial infections, which often proves to be multiresistant to the tested antibiotics, but is rarely involved in nosocomial meningitis. We report two cases of nosocomial meningitis with Acinetobacter baumanii multiresistant: in the first case it was a complication of a cranial trauma whereas in the second case, it was postoperative nosocomial meningitis in neurosurgery. The diagnosis was retained on a cluster of clinical, biochemical and bacteriological arguments. The outcome was unfavorable with patient deaths.
Keywords: Acinetobacter baumannii, multiresistant, nosocomial meningitis, colistin, tigecycline.

INTRODUCTION

In recent decades, Acinetobacter baumanii (AB) has evolved from a low-grade pathogen to one of the main germs responsible for nosocomial infections with significant morbidity and mortality [1]. It is a germ associated in large part with the quality of hygiene and the various invasive devices especially in the intensive care units [2]. However, it is a rare germ in the nosocomial meningitis and is exceptional as a source of postoperative meningitis, and makes it difficult to manage both diagnostically and therapeutically [3]. Indeed, the Acinétobacter baumanii have a power of development of resistance to the antibiotics, in particular the carbapenems, making the meningitis to this germ a bit delicate to manage given the lack of antibiotics which at the same time; Diffuse at the neuro-meningeal level and which are effective against multi-resistant AB (ABMR) [4].

OBSERVATIONS

Case 1

He is an 18 years old victim of a road accident involving a polytrauma. The patient was admitted to the de-shock service and required intubation and assisted ventilation. The evolution was marked at D14 by the advent of nosocomial pneumopathy with evidence of the presence of multi-sensitive Pseudomonas aeruginosa, methicillin-sensitive staphylococcus aureus, and the Acinetobacter. baumannii multi-resistant susceptible to colistin alone, which was started intravenously. At D15, his neurological condition was aggravated in relation to nosocomial meningitis. A lumbar puncture was performed. The proteinurrhachia was 19 g / l and glycorrhachia was very low (0.04 g / l). A blood count showed a leukocyte count at 31 100 / mm³ with 80% neutrophilic polymorphonuclear cells. The reactive C-protein was at 235 mg / L. Bacteriological examination revealed the presence of Acinetobacter. Baumannii with the same phenotype of antibiotic resistance as that of protected distal bronchial specimen and a blood culture carried out. The outcome was unfavorable with patient death on D18.

Case 2

It is a 10-year-old girl with a history of complicated meningitis of hydrocephalus. Admitted to the neurosurgery department for external derivation, the patient received a preoperative lumbar puncture which was sterile. The evolution was marked by the occurrence at postoperative D4 of a nosocomial meningitis of consciousness disorders (obnubilation) and fever at 39-40°C. A performed cerebral tomodensitometry was normal (except for hydrocephalus), whereas the cerebrospinal fluid(CSF) study, based on the lumbar puncture and the bypass drain, showed hypercellularity predominantly polymorphonuclear neutrophil, proteinorrhachia at 4g / l and hypoglycorrhachia at 0.08g/ l, with bacteriological examination the presence of *Acinetobacter. baumannii* multiresistant except colistin. A blood culture carried out was sterile. The patient was placed under colistin intravenously but the development

was unfavorable with the death of the girl at D10 postoperative.

DISCUSSION

Acinetobacter spp. is polymorphic non-fermentative, gram-negative coccobacilli which are non-sporulated but sometimes capsulated in pathological specimens. They are strict aerobic, positive catalase and negative oxidize. Ubiquitous germs that are widely distributed in the nature, soil, freshwater, in animals and food (dairy, meat, etc.), are capable of using a wide variety of substrates as a source of energy, which allows them to have a very large habitat and to persist in a hostile environment (ventilation equipment, mattresses in burners, perfusion bottles, incubator water, etc.). Acinetobacter is a human commensal and is part of the cutaneous flora (folds, interdigital spaces). Acinetobacter baumannii is the species involved in nosocomial infections. The first reservoir is the infected and / or colonized patient, the environment constituting only the secondary reservoir. Manuporing is the main route of transmission [5,6,7].

The preferred infectious sites of Acinetobacter. baumannii are pneumopathies, infections of the urinary tract and soft part and bacteraemia [6, 8]. Nosocomial meningitis with Acinetobacter. Baumannii are relatively rare [9] and exceptional after neurosurgical intervention (craniotomy, ventriculostomy)

The main risk factors are: advanced age, urgent neurosurgical procedures, external ventricular drainage (delay ≥ 5 days). Any neurosurgical intervention with or without an external ventricular drain is potentially a source of nosocomial meningitis with Acinetobacter. Baumannii [10].

The nosocomial etiology was retained when the meningitis occurred after 48 hours of hospitalization, the surgical procedure and the previous cytobacteriological examination of CSF which was sterile. The responsibility of Acinetobacter. Baumannii was retained in front of: predominantly polynuclear neutrophilic hypercellularity, concomitant biochemical abnormalities of CSF (hypoglycorrhachia and hyperproteinorrhachia), isolation of Acinetobacter. baumannii, in pure culture and with the same profile of resistance to antibiotics, from lumbar puncture, blood cultures and protected distal bronchial specimen.

For our first patient, the most probable contamination hypothesis is that of diffusion contamination from the near pulmonary focus due to the isolation of an Acinetobacter. Baumannii with a resistant profile identical to the strain isolated at level of CSF and blood culture, whereas for the second patient, contamination by invasive procedures (placement of external ventricular catheter) and manuportage is most probably.

The treatment of these strains of Acinetobacter. Baumanii multidrug-resistant, poses a real therapeutic problem (reduced number of active molecules, the property of crossing the blood-brain barrier and CSF diffusion). The high sensitivity to colistin makes it the only therapeutic alternative available. This molecule has been successfully used intravenously or intrathecally in the treatment of multidrug-resistant Acinetobacter. baumannii infections [11, 12]. Our patients were treated by intravenously colistin, but the evolution was unfavorable.

Currently, a new combination of tigecycline and colistin is reported to be effective in the intrathecally treatment of nosocomial meningitis with Acinetobacter baumanii multiresistant. However, the use of tigecycline in infections of the nervous system is not well studied [13, 14].

Mortality associated with nosocomial infections with Acinetobacter. baumannii is high and especially in neurosurgery. Studies reported a mortality rate of 27% in the United States [5] and 15% in Australia [15]. Gulati and al in India reported a significantly higher mortality rate in patients with nosocomial meningitis compared to those with multidrug-resistant Acinetobacter. Baumannii [5]. The evolution was unfavorable for our two patients, a few days after the diagnosis.

Strategies for the control of nosocomial infections must necessarily incorporate prevention that has proved to be as effective as it is efficient (increasing hygiene in the hospital, disinfection of the hands by hydro-alcoholic friction, banning the permanent wearing of gloves without changing between sickness, geographic and technical isolation, effective surveillance and prevention program) and the rationalization of antibiotic prescribing in order to reduce the selection pressure.

CONCLUSION

Multidrug-resistant Acinetobacter. Baumannii meningitis is severely complicating neurosurgical procedures. Treatment of these infections is a challenge for the clinician and the therapeutic experience with these multi-resistant organisms is limited. Colistin has increased its therapeutic efficacy and tigecycline may have an important place in the treatment of these infections. Life expectancy is often initiated with high mortality.

REFERENCES

1. Giamarellou H, Antoniadou A, Kanellakopoulou K. Acinetobacter baumannii: a universal threat to

public health? Int J Antimicrob Agents 2008;32:106–19.
2. Agodi A, Zarrilli R, Barchitta M, Anzaldi A, Di Popolo A, Mattaliano A, Ghiraldi E, Travali S. Alert surveillance of intensive care unit-acquired Acinetobacter infections in a Sicilian hospital. Clinical Microbiology and Infection. 2006 Mar 1;12(3):241-7.
3. Kim HI, Kim SW, Park GY, Kwon EG, Kim HH, Jeong JY, Chang HH, Lee JM, Kim NS. The causes and treatment outcomes of 91 patients with adult nosocomial meningitis. The Korean journal of internal medicine. 2012 Jun;27(2):171.
4. Cai Y, Chai D, Wang R, Liang B, Bai N. Colistin resistance of Acinetobacter baumannii: clinical reports, mechanisms and antimicrobial strategies. Journal of antimicrobial chemotherapy. 2012 Mar 22;67(7):1607-15.
5. Zohoun A, Dao I, Karfo R, Essayagh T, Sekhsokh Y, Bousta M, El Hamzaoui S. Nosocomial multidrug-resistant Acinetobacter baumannii meningitis in postoperative neurosurgery: a case study. Pathologie-biologie. 2012 Apr;60(2):e6-8.
6. Maragakis LL, Perl TM. Acinetobacter baumannii: epidemiology, antimicrobial resistance, and treatment options. Infect Dis 2008;46(Suppl. 8):1254–63.
7. Joly-Guillou M-L, Kempf M. Acinetobacter: epidemiology and microbiological diagnosis.EMC Med Bio. Vol 8 N° 4 (2013).
8. Paramythiotou E, Karakitsos D, Aggelopoulou H, Sioutos P, Samonis G, Karabinis A. Post-surgical meningitis due to multiresistant Acinetobacter baumannii. Effective treatment with intravenous and/or intraventricular colistin and therapeutic dilemmas. Médecine et maladies infectieuses. 2007 Feb 28;37(2):124-5.
9. Lowman W, Kalk T, Menezes CN, John MA, Grouch MP. A case of communityacquired Acinetobacter baumannii meningitis – has the threat moved beyond the hospital? J Med Microbiol 2008;57(Suppl. 5):676–8.
10. Krol V, Hamid NS, Cunha BA. Neurosurgically related nosocomial Acinetobacter baumannii meningitis: report of two cases and literature review. Journal of Hospital Infection. 2009 Feb 28;71(2):176-80.
11. Ho YH, Wang LS, Chao HJ, Chang KC, Su CF. Successful treatment of meningitis caused by multidrug-resistant Acinetobacter baumannii with intravenous and intrathecal colistin. Journal of microbiology, immunology, and infection= Wei mian yu gan ran za zhi. 2007 Dec;40(6):537-40.
12. Dalgic N, Ceylan Y, Sancar M, Telhan L, Kafadar I, Cavusoglu H, Ceylan O, Hasim O. Successful treatment of multidrug-resistant Acinetobacter baumanii ventriculitis with intravenous and intraventricular colistin. Annals of tropical paediatrics. 2009 Jun 1;29(2):141-7.
13. Regaieg K, Bahloul M, Turki O , Mnifb B, Bouaziz M. The efficacy of the tigecycline–colistin association in the treatment of multi-resistant Acinetobacter baumannii meningitis.
14. Lauretti L, D'Alessandris QG, Fantoni M, D'Inzeo T, Fernandez E, Pallini R, Scoppettuolo G. First reported case of intraventricular tigecycline for meningitis from extremely drug-resistant Acinetobacter baumannii. Journal of neurosurgery. 2016 Aug:1-4.
15. Kim BN, Peleg AY, Lodise TP, Lipman J, Li J, Nation R, Paterson DL. Management of meningitis due to antibiotic-resistant Acinetobacter species. The Lancet infectious diseases. 2009 Apr 30;9(4):245-55.