Corynebacterium striatum: An Unusual Pathogen of Nosocomial Meningitis

Emine ALP1, Duygu PERÇİN2, Ahmet SELÇUKLU3, Mehmet DOĞANAY1

1 Department of Infectious Diseases and Clinical Microbiology, Faculty of Medicine, University of Erciyes, Kayseri, Turkey
2 Department of Microbiology and Clinical Microbiology, Faculty of Medicine, University of Erciyes, Kayseri, Turkey
3 Department of Neurosurgery, Faculty of Medicine, University of Erciyes, Kayseri, Turkey

SUMMARY

A 55-year-old woman was admitted due to subarachnoidal hemorrhage, and external ventricular drainage catheter was inserted. Two days after the procedure, carbapenem-resistant Acinetobacter baumannii meningitis developed. After 10 days of treatment with intravenous tigecycline (200 mg/day) and intrathecal netilmicin (9 mg/day), colistin was obtained, and the antimicrobial therapy was changed to intravenous and intrathecal colistin, together with intrathecal netilmicin; tigecycline was stopped. Cerebrospinal fluid sterility could not be achieved under this therapy, and after repeated manipulation of the external ventricular drainage catheter, Corynebacterium striatum was isolated from two cultures of cerebrospinal fluid, which were performed on consecutive days. Vancomycin (2 g/day) and intrathecal gentamicin (8 mg/day) were initiated; however, the patient died on the second day of this therapy.

Key Words: Corynebacterium striatum, Meningitis, Drainage

ÖZET

Corynebacterium striatum: Nozokomiyal Menenjitte Nadir Bir Patojen

Emine ALP1, Duygu PERÇİN2, Ahmet SELÇUKLU3, Mehmet DOĞANAY1

1 Erciyes Üniversitesi Tip Fakültesi, İnfeksiyon Hastalıkları ve Klinik Mikrobiyoloji Anabilim Dalı, Kayseri, Türkiye
2 Erciyes Üniversitesi Tip Fakültesi, Mikrobiyoloji ve Klinik Mikrobiyoloji Anabilim Dalı, Kayseri, Türkiye
3 Erciyes Üniversitesi Tıp Fakültesi, Beyin Cerrahisi Anabilim Dalı, Kayseri, Türkiye

Elli beş yaşındaki kadın hasta subarachnoidal kanama nedeniyle acil servise başvurdu. Hastaya eksternal ventriküler drenaj takıldı. İki gün sonra hastada Acinetobacter baumannii menenjiti gelişti. Kolistin temin edilemediği için intravenöz tigesiklin (200 mg/gün) ve intratekal netilmisin (9 mg/gün) verildi. Kolistin 10 gün sonra başlanılabildi. Kolistin intravenöz (240 mg/gün) ve intratekal (10 mg/gün) olarak, intratekal netilmisin ile birlikte verildi ve tigesiklin kesildi. Eksternal ventriküler drenajdan tekrarlayan işlemler sonrası, hastada Corynebacterium striatum menenjiti gelişti. Vankomisin (2 g/gün) ve intratekal gentamisin (8 mg/gün) tedavisi başlandı. Ancak hasta bu tedavinin ikinci günü kaybedildi.

Anahtar Kelimeler: Corynebacterium striatum, Menenjit, Eksternal ventriküler drenaj

Geliş Tarihi/Received: 15/09/2010 - Kabul Ediliş Tarihi/Accepted: 27/12/2010
INTRODUCTION

Corynebacterium striatum is non-motile, non-sporing, catalase-positive and gram-positive aerobic rod. The organism is known as saprophytic cutaneous bacterium and it is generally regarded as a contaminant when isolated from cultures. It rarely causes human infections[1]. In this report, we present a patient with nosocomial C. striatum meningitis associated with external ventricular drainage (EVD) catheter.

CASE REPORT

A 55-year-old woman was admitted to the hospital with headache, nausea and unconsciousness. EVD catheter was inserted in emergency service on the day of admission because of subarachnoidal hemorrhage and she was followed up in the neurological intensive care unit. Two days later, she developed fever and mental and motor disorientation. Cerebrospinal fluid (CSF) analysis revealed pleocytosis [white blood cell (WBC) count 90/mm³ with polymorphonucleocytes predominance], 50/mm³ red blood cells (RBC), and glucose 102 mg/dL (blood glucose 125 mg/dL), with a total protein of 180 mg/dL. On CSF Gram stain, gram-negative bacilli were seen, and vancomycin (2 g/day) and meropenem (3 g/day) were started. CSF culture grew multi-drug-resistant (susceptible to only colistin, tigecycline and netilmicin) Acinetobacter baumannii. Vancomycin and intrathecal gentamicin (8 mg/day) therapy were begun; however, the patient died on the second day of therapy.

DISCUSSION

EVD is frequently necessary in neurosurgical intensive care unit patients. However, meningitis and ventriculitis are serious complications of this procedure. The etiology of nosocomial meningitis most frequently arises from skin flora, and Staphylococcus epidermidis and Staphylococcus aureus account for 80% of the cases of nosocomial meningitis and ventriculitis. However, widespread use of antibiotics and hospital flora may have altered the epidemiology of post-neurosurgical meningitis[2]. Most nosocomial infections in our intensive care units were associated with multi-drug resistant Acinetobacter spp., and 83% of cases of nosocomial gram-negative meningitis were associated with multi-drug resistant Acinetobacter spp.[3,4]. Also, in this case, A. baumannii was the cause of the first meningitis episode. However, extended duration, frequent manipulation, leaks, and ringing these 10 days, repeated CSF analysis was performed. In these analyses, WBC counts and CSF protein (290 mg/dL) increased and CSF glucose (30 mg/dL; blood glucose 134 mg/dL) decreased. Furthermore, CSF sterility could not be achieved and repeat cultures yielded A. baumannii. After the fourth day of colistin therapy, Corynebacterium spp. were cultured from repeated CSF analysis, and CSF protein was increased (301 mg/dL) and glucose (5 mg/dL; blood glucose 116 mg/dL) decreased. Phylogenetic analysis of the isolate by 16S rRNA revealed the strain as C. striatum. Neighbor-joining phylogenetic tree of the strain within the radiation of species of the genus Corynebacterium is shown in Figure 1. Vancomycin and intrathecal gentamicin (8 mg/day) therapy were begun; however, the patient died on the second day of therapy.

Figure 1. Neighbor-joining phylogenetic tree showing the position of the strain within the radiation of species of the genus Corynebacterium.
irrigation of the catheter increase the risk of repeated episodes and vary the etiology of meningitis. In patients with foreign bodies and frequent manipulation, cutaneous organisms such as coagulase-negative staphylococci or Corynebacterium spp. may cause severe infections like meningitis[2]. However, these organisms may be disregarded by clinicians and accepted as contaminants. C. striatum was the cause of the second meningitis episode in this case. This is the first case of C. striatum meningitis in our intensive care unit, and we initiated therapy after repeated positive CSF cultures. There are only a few case reports about human infections caused by this microorganism. C. striatum has been mainly associated with infective endocarditis, and there is only one case of nosocomial meningitis in the English literature[1,5]. Immunosuppression and indwelling foreign materials (central venous catheter, peritoneal dialysis catheter, prosthetic valve, etc.) are risk factors for C. striatum infection, as for all skin flora elements. Vancomycin was the therapeutic agent most frequently used in the management[2]. Removal of the catheter should be considered in therapeutic failure and recurrent infections.

In conclusion, clinicians should be aware of C. striatum, an unusual cause of nosocomial meningitis, especially in immunocompromised patients and patients with indwelling catheter. Repeated isolation of the microorganism from sterile body fluids must alert clinicians to the possible diagnosis of invasive disease.

REFERENCES


Yazışma Adresi/Address for Correspondence
Doç. Dr. Emine ALP
Erciyes Üniversitesi Tıp Fakültesi
Infeksiyon Hastalıkları ve Klinik Mikrobiyoloji Anabilim Dalı,
38039 Kayseri-Türkiye
E-posta: ealp@erciyes.edu.tr