

Case Report

Community-acquired spontaneous acute meningitis by *Pseudomonas* in adult without risk factors

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Received : 04 March 2021

Accepted : 27 April 2021

Published : 22 June 2021

DOI

10.25259/AUJMSR_11_2021

Quick Response Code:



ABSTRACT

Community-acquired meningitis by Gram-negative bacilli (GNB) occurs commonly with preexisting conditions such as neurosurgery, neurosurgical devices, trauma, remote source of infection, organ dysfunction, and nosocomial and immunocompromised state, but rarely occurs without these risk factors. Few case reports with *Escherichia coli* and *Pseudomonas aeruginosa* that too have some risk factors have been described in literature till now. GNB meningitis is associated with high mortality. There is very little literature available for community-acquired *P. aeruginosa* meningitis to date in patient without risk factors. Community-acquired spontaneous *P. aeruginosa* meningitis with pyogenic ventriculitis in a patient without any risk factors in adults is a rare entity and is likely to under-recognized.

Keywords: Community-acquired spontaneous acute meningitis, *Pseudomonas*, Gram-negative bacilli

INTRODUCTION

Gram-negative bacilli (GNB)-induced community-acquired meningitis in adults ranges from 0.7 to 6.8% across the world.^[1] Most cases of GNB meningitis (75%) occur in patients with some risk factors such as neurosurgical procedure, head trauma, neurosurgical device, or cerebrospinal fluid (CSF) leak.^[2] The reported annual incidence of spontaneous GNB meningitis in adults is around two cases per 100,000 adults. The highest reported incidence is around 8.7%, of which, *Escherichia coli* represents around 41.9%.^[3] The most common cause of community-acquired causes of acute meningitis in adults are *Streptococcus pneumoniae*, *Neisseria meningitidis*, and *Haemophilus influenzae*. The empirical therapy usually covers these organisms. The presence of empyema ventriculitis along with community-acquired spontaneous *Pseudomonas aeruginosa* acute meningitis is much rare. We are presenting a case of community acquired spontaneous *P. aeruginosa* meningitis with empyema ventriculitis in a patient without any risk factors.

CASE PRESENTATION

A 66-year-old male patient known case of hypertension on antihypertensives for 10 years presented to the intensive care unit with a history of fever and altered sensorium for the past 7–8 days. On admission, the patient had Glasgow Coma Scale score of 9, temperature (100 F), a heart rate of 94/min, blood pressure of 110/70 mmHg, respiratory rate of 24/min, and blood glucose of 140 mg/dl. The signs of meningeal irritation were present but no focal neurological deficit. Clinical examination was otherwise normal except for bilateral conducted sounds on auscultation.

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His magnetic resonance imaging scan showed chronic small vessel changes, leptomeningeal enhancement, and restricted diffusion debris in occipital horns of lateral ventricles [Figure 1]. CSF was turbid and analysis showed hypoglycorrhachia (50 mg/dl with blood sugar of 140 mg/dl), elevated protein 1434 mg/dl, ADA-89, and neutrophil-predominant pleocytosis (full field white cells), neutrophils – 70%, and lymphocytes – 30% suggestive of acute pyogenic meningitis, no organism was seen on Gram and acid fast stain. He was started empirically on ceftriaxone 4 g/day in two divided doses, vancomycin 500 mg in 4 times daily, acyclovir 750 mg 8 hourly, and dexamethasone 8 mg 6 hourly intravenously before giving vancomycin. Initial peripheral blood WBC count was 11,100 with 78% neutrophils. His serum creatinine was 2.8 mg/dl and liver function tests were normal. Ultrasound abdomen showed normal study and no features of chronic kidney disease. After 24 h, CSF culture sensitivity revealed growth of pan-sensitive *P. aeruginosa* and antibiotics were changed to ceftazidime and acyclovir was stopped. Urine culture and blood cultures sent before initiation of antibiotics were negative for any bacterial growth. There was gradual improvement in sensorium after starting antibiotics but unfortunately on day 5, the patient left against medical advice due to socioeconomic reasons and he expired on very next day.

DISCUSSION

Community-acquired spontaneous *P. aeruginosa* meningitis in adults is rare without any risk factors. Recent study by Bichon *et al.* revealed a total of 45 cases of *E. coli* meningitis from 1945 to 2017 and had one or the other risk factors such as alcoholism with cirrhosis, uncontrolled diabetes, disseminated strongyloidiasis, chronic organ dysfunction, and other immunocompromised state.^[1] In our case, there were no predisposing factors such as neurosurgical

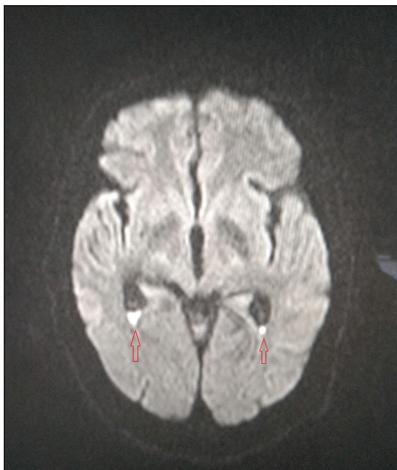


Figure 1: Red arrow shows lateral ventricle deposits.

procedure, head trauma, neurosurgical device, or CSF leak. The presence of signs of pyogenic ventriculitis on imaging is uncommon in community-acquired acute cases. The previous studies describe the spontaneous community-acquired *P. aeruginosa* meningitis in patients with some preexisting risk factors and nosocomial meningitis. In a Spanish case series of 544 cases of spontaneous bacterial meningitis, in 7% of cases, the causative agent was GNB, of which the most common pathogens were *E. coli* and *Pseudomonas* species. In this study, risk factors such as advanced age, history of cancer, nosocomial infection, and urinary tract infection to be associated with GNB meningitis.^[3] In a recent case series lasting 18 years, 19 out of 21 patients who grew *P. aeruginosa* from CSF culture had previously undergone a neurosurgical procedure, and 7 had extraventricular devices *in situ*. Twelve had *P. aeruginosa* isolated from another site previously.^[4]

There are case reports of *Pseudomonas* meningitis following spinal anesthesia^[5] and it is relatively common in uremic patients on hemodialysis.^[6] Patients with Gram-negative bacillary meningitis typically have a very severe clinical picture and high mortality rate, it has high fatality rate of the bacterial meningitis.^[3] *Pseudomonas* meningitis is commonly an acute severe infection^[4,7] and is often related to surgery.^[7,8] Recent case report by Gallaher *et al.* published a report of a patient who presented with community-acquired chronic meningitis secondary to *P. aeruginosa*, related to surgery previously.^[9]

CONCLUSION

Community-acquired spontaneous acute meningitis by *P. aeruginosa* is rarely considered for initial empirical treatment in adults. GNB meningitis is associated with high mortality. The spontaneous community-acquired acute GNB meningitis should be kept in mind for better outcome. Finally, the outcome of acute GNB meningitis with pyogenic ventriculitis depends on early diagnosis, appropriate antibiotic therapy for recommended dose and duration. The probable cause of poor outcome in our patient was late presentation.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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How to cite this article: Singla SK, Singh R. Community-acquired spontaneous acute meningitis by pseudomonas in adult without risk factors. *Adesh Univ J Med Sci Res* 2021;3(1):50-2.