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Case report

Rare but not forgotten: A case of meningitis due to ceftriaxone-resistant *Streptococcus pneumoniae*

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ABSTRACT

Despite the dramatic decrease in invasive pneumococcal disease since the widespread use of the first pneumococcal vaccine, invasive and resistant disease still occurs. We present a case of ceftriaxone-resistant pneumococcal meningitis suggesting that continued vigilance is warranted for empiric treatment of meningitis when *Streptococcus pneumoniae* is a concern.

Introduction

Invasive pneumococcal disease (IPD) has dramatically decreased since the introduction of the pneumococcal conjugate vaccine 7 in 2000, and the rate of IPD due to resistant pneumococci dropped over 50% from 1999 to 2004 [1]. Meningitis due to ceftriaxone-resistant *Streptococcus pneumoniae* still occurs but is uncommon—96.4% of *S. pneumoniae* isolated from meningitis patients between 2001 and 2015 in Rhode Island (RI) were susceptible to ceftriaxone [2].

In 1994, a 33-year-old man in RI with pneumococcal meningitis failed to respond to therapy with ceftriaxone and dexamethasone [3]. He developed hydrocephalus and grand mal seizures, and his antimicrobial regimen was switched to IV vancomycin and rifampin when culture yielded *S. pneumoniae* resistant to ceftriaxone. The patient required bilateral ventriculoperitoneal shunts, and his condition improved.

Case report

More than 20 years later, in February 2017, a 68-year-old woman with a history of recurrent otitis presented to a hospital in RI with one day of fever, otalgia, and encephalopathy. Imaging revealed a small intraventricular bleed with mild sphenoid sinusitis, chronic mastoiditis, and ventriculitis. She was given ceftriaxone 2 g IV every 12 h, vancomycin 1 g IV twice daily (aiming for a trough of 15–20 mcg/mL), rifampin 600 mg IV daily, and dexamethasone IV. Levetiracetam was given for seizure prophylaxis. Cerebrospinal fluid and blood cultures yielded *S. pneumoniae* resistant to ceftriaxone with a minimum inhibitory concentration (MIC) of 2 mcg/mL; the isolate was sensitive to vancomycin and rifampin. The patient's mental status returned to baseline within five days. Ceftriaxone, vancomycin, and rifampin were continued for 2 weeks following the first negative blood culture. She had no residual symptoms at clinic follow-up on her last day of therapy.

This case of ceftriaxone-resistant *S. pneumoniae* meningitis comes at a time when both IPD and resistant pneumococci are rarely a concern in immunocompetent individuals. Treatment for possible resistant pneumococci was based on knowledge of a similar prior case and a review of recently available Infectious Disease Society of America guidelines for the diagnosis and treatment of meningitis and ventriculitis. These guidelines suggest considering rifampin as an adjunct to vancomycin and continuing both when the MIC of ceftriaxone is > 2 ug/mL [4,5]. This case suggests continued vigilance is warranted for the rare but real possibility of ceftriaxone-resistant pneumococci causing meningitis in an adult. While ceftriaxone and vancomycin are standard choices for the empiric treatment of meningitis, rifampin should be considered as an adjunctive therapy in severe cases until susceptibilities allow for de-escalation.

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