

Case of meningitis in a neonate caused by an extended-spectrum-beta-lactamase-producing strain of hypervirulent *Klebsiella pneumoniae*

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Abstract

© 2017 Khaertynov, Anokhin, Davidyuk, Nicolaeva, Khalioullina, Semyenova, Alatyrev, Skvortsova and Abrahamyan. *Klebsiella pneumoniae* is one of the most important infectious agents among neonates. This pathogen has a potential to develop an increased antimicrobial resistance and virulence. The classic non-virulent strain of *K. pneumoniae*, producing an extended-spectrum beta-lactamases (ESBL), is associated with nosocomial infection mainly in preterm neonates. Hypervirulent *K. pneumoniae* strains are associated with invasive infection among previously healthy ambulatory patients, and most of them exhibit antimicrobial susceptibility. During the last few years, several cases of diseases caused by hypervirulent *K. pneumoniae* producing ESBL have been registered in different geographical regions of the world. However, reports of such cases in neonates are rare. Here, we reported that this pathogen can cause pyogenic meningitis in full-term neonate with poor prognosis. A previously healthy, full-term, 12-day-old neonate was admitted to the infectious diseases hospital with suspected meningitis. The clinical symptoms included loss of appetite, irritability, fever, seizures, and a bulging anterior fontanelle. The analysis of the cerebrospinal fluid confirmed the diagnosis of meningitis. Blood and cerebrospinal fluid cultures were positive for *K. pneumoniae*, producing ESBL. *K. pneumoniae* isolates were resistant to aminopenicillins, 3rd generation cephalosporins but were sensitive to imipenem and meropenem. The "string test" was positive. The study of the virulence factors of *K. pneumoniae* by PCR revealed the presence of the *rmpA* gene. A combination of *K. pneumoniae* virulence and drug resistance complicated by cerebral oedema led to the death of the neonate. We concluded that both the risk of developing severe forms of infection and the outcome of the disease due to *K. pneumoniae* are associated with the phenotypic features of the pathogen such as its antibiotic susceptibility and virulence factors. Emergence of the ESBL-producing strain of hypervirulent *K. pneumoniae* could represent a new serious threat to public health, suggesting an urgent need to enhance clinical awareness and epidemiological surveillance.

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Keywords

Extended-spectrum β -lactamases, Hypervirulent, *Klebsiella pneumoniae*, Meningitis, Neonate

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