Nontyphoidal salmonellae represent one of the principal pathogens implicated in food-borne gastroenteritis worldwide. Although antibiotics are not usually recommended in cases of Salmonella enterocolitis, they are crucial if the infection spreads from the intestine, leading to invasive complications including meningitis, sepsis and bacteremia (1). These complications are more common in infants, the elderly and immunocompromised patients. In these potentially life-threatening cases, the antibiotics of choice are fluoroquinolones and extended-spectrum cephalosporins (2). Salmonella spp. resistant to extended-spectrum cephalosporins have been recognized since 1988 (3), and are increasing in prevalence worldwide (2). This is of particular concern for the treatment of salmonellosis in children, because fluoroquinolones are not indicated in this age group. Treatment failures due to in-vivo acquisition of an extended-spectrum β-lactamase (ESBL) gene in nontyphoidal salmonellae are now well established. A 45-day-old male baby presented to the pediatric intensive care unit with a history of fever, poor feeding, two episodes of seizures of 3 days duration and recurrent apnoea. At admission, cerebrospinal fluid, stool and blood cultures were done and Salmonella enterica serovar Typhimurium was isolated from all the samples. The stool isolate was confirmed to be ESBL producing. The baby expired due to acute pyogenic meningitis.

A Case of Fatal Acute Pyogenic Meningitis in a Neonate Caused by Extended-Spectrum β-Lactamase Producing Salmonella Group B

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SUMMARY: Salmonellosis constitutes an important public health problem throughout the world. In severe infections like meningitis and septicemia, antibiotic treatment is essential. Extended-spectrum cephalosporins are preferentially used to treat salmonellosis in children. Treatment failures due to in-vivo acquisition of an extended-spectrum β-lactamase (ESBL) gene in nontyphoidal salmonellae are now well established. A 45-day-old male baby presented to the pediatric intensive care unit with a history of fever, poor feeding, two episodes of seizures of 3 days duration and recurrent apnoea. At admission, cerebrospinal fluid, stool and blood cultures were done and Salmonella enterica serovar Typhimurium was isolated from all the samples. The stool isolate was confirmed to be ESBL producing. The baby expired due to acute pyogenic meningitis.

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Salmonella group B by the combination disk method. It depends on comparing the inhibition zones given by ceftazidime (30 μg) and ceftazidime-plus-clavulanate (30 μg plus 10 μg) disks. A ≥5 mm increase in the zone diameter in the presence of a clavulanic acid disk versus the cephalosporin disk alone was interpreted as phenotypic evidence of ESBL production. The tests were performed according to CLSI guidelines (9).

CSF analysis revealed a glucose level of 13 mg/dl and a protein level of 110 mg/dl, which is consistent with pyogenic meningitis. The fasting and post-prandial blood glucose level (150 and 184 mg/dl) suggested impaired glucose tolerance. The blood urea and sodium levels were normal. Also, the potassium levels were raised (5.69 mEq/L).

Historically, S. Typhimurium has been the most frequently reported serotype (10). Humans, domestic and wild animals, food stuffs and environments containing cattle and poultry are important sources of S. Typhimurium infection for humans (11). A majority of the ESBL-producing Salmonella isolates have been S. Typhimurium. Nosocomial infections caused by ESBL-producing nontyphoidal salmonellae are not often reported (12).

It is interesting to note that only the stool isolate was resistant to many antibiotics including the cephalosporins, while the isolates from CSF and blood were sensitive; this could be attributed to conjugative transfer of plasmid-located elements from the bowel flora during their passage through the gut (13-15). The course of cephalosporin treatment might eliminate the sensitive strains from the bloodstream and CSF. However, the resistant strains in the gut could continue the infection. This report highlights the importance of detecting ESBL in nontyphoidal salmonellae. Such data will give useful information about the appropriateness of using cephalosporins. Continued surveillance of the presence of ESBLs and rapid elucidation of the mode of spread of these resistance genes in nontyphoidal salmonellae are essential to minimize the risks to future treatment that their widespread dissemination would create (16).

To the best of our knowledge not many reports of ESBL-producing nontyphoidal salmonellae exist to date. Relevant risk factors for the acquisition of the infection could not be specified in this case. The strains were incidentally ESBL-producing, but the death of the patient cannot be attributed to this fact. The delay in the institution of appropriate therapy could be responsible for the clinical course and the fatality. Differences in the sensitivity pattern among samples of the same serovar isolated from different anatomical sites is the characteristic finding in the case.

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