

Ceftriaxone-resistant *Shigella flexneri*: A case report

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ABSTRACT

Shigella dysentery is common in developing countries, where poor hygienic conditions exist. Though most cases of shigellosis are self-limited, the cause for concern is the rising incidence of multidrug-resistant (MDR) shigella strains due to irrational use of antibiotics. We report a case of shigella dysentery caused by Ceftriaxone-resistant *Shigella flexneri* 2a, susceptible only to Azithromycin. The patient recovered after treatment with Azithromycin.

Key words: Ceftriaxone resistant shigella, Dysentery, *Shigella flexneri*

INTRODUCTION

Shigellosis is a major public health problem in developing countries due to poor sanitation. *Shigella* can also cause epidemics with considerable morbidity and mortality. Antibacterial therapy can reduce the severity of the illness and duration of hospital stay and can also prevent serious complications. However, over the past several decades there has been several series of reports documenting resistance of shigella against various widely used antibiotics, complicating the choice of empirical therapy. We hereby present a case of dysentery caused by multidrug-resistant (MDR) *Shigella flexneri*. This is the first case of Ceftriaxone-resistant shigellosis reported from the Government Medical College, Kozhikode and to the best of our knowledge from Kerala.

CASE REPORT

A 49-year-old man from north Kerala presented with complaints of fever and diarrhea for two days. Diarrhea was of small volume with a frequency ranging from 20 to 30 per day. The stool contained blood and mucus with fecal matter. The patient also had lower abdominal cramps and tenesmus. There was history of food and water intake under unhygienic conditions. On examination he was febrile. There was moderate dehydration and normal blood pressure. Tenderness could be elicited

in the left iliac fossa. Routine investigation and stool culture were done. He was empirically started on oral Ciprofloxacin, as per the unit protocol, which is based on the Center for Disease Control and Prevention (CDC) recommendation,^[1] along with oral and intravenous rehydration. His hydration status improved. But there was no resolution of symptoms. Blood routine and stool microscopy findings were as follows.

Blood routine: Hemoglobin (Hb) - 16.8 gm/dl, total count (TC)-5700/mm³, differential count (DC)-N59, L27, M13; platelet count-1.7 L/mm³, erythrocyte sedimentation rate (ESR)-7mm 1st hr, blood urea- 46mg/dl, serum creatinine-0.9 mg/dl, serum sodium-131 mmol/L, serum potassium-3.8 mmol/L.

Stool examination: Appearance-Loose stools with mucus. On microscopy-Pus cells 10-15/hpf, red blood cells (RBC) numerous, No parasitic cysts/ova.

On the third day the stool culture yielded *S. flexneri* resistant to Ampicillin, Cotrimoxazole, Nalidixic acid, Ciprofloxacin, Chloramphenicol and Ceftriaxone and susceptible only to Azithromycin, as per the Clinical and Laboratory Standards Institute (CLSI) standards. Hence the patient was started on Azithromycin orally. The frequency of stools decreased the next day along with disappearance of blood in the stool and it became formed. Repeat culture was negative for shigella.

The culture isolate was sent to National Institute of Cholera and Enteric Diseases (NICED), Kolkata for confirmation, the species was identified as *S. flexneri* 2a.

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DISCUSSION

Shigellosis is primarily a disease of resource-poor, crowded communities that do not have adequate sanitation or safe water, and where disease rates may be high. Because shigellae have acquired multiple antimicrobial resistances, the challenge for clinical management is identifying which drugs retain their activity and clinical effectiveness. The CDC have recommended that sensitivity testing shall be performed to guide the selection of appropriate antimicrobial therapy for shigellosis (CDC, 2014). However, testing requires several days to complete, resulting in delay in treatment and is generally not feasible in developing countries. Because antimicrobial susceptibility patterns of shigellae may vary greatly in different geographical areas and over time, monitoring resistance patterns is needed to guide selection of appropriate empiric treatment.^[2] The CDC recommends Ciprofloxacin for empirical treatment in adults.^[1]

Resistance of shigella against Ampicillin, Cotrimoxazole and Nalidixic acid is well documented. In all, 134 isolates of *Shigella* spp. were subjected to susceptibility testing at Bangalore in 2007 and it was found that up to 70% of the cases were resistant to Ampicillin, Cotrimoxazole and Nalidixic acid.^[3] However, none of the isolates were resistant to Ceftriaxone. In St. Johns Medical College, Bangalore, the first case of Ceftriaxone resistance in shigella was documented in 2010.^[4] A study conducted at Kolkata in the year 2002 showed resistance to Nalidixic acid and ampicillin in all of the 39 shigella isolates. All the cases were susceptible to Ceftriaxone and Ofloxacin. Six of the fifty isolates of *Shigella* spp. studies in the Andaman and Nicobar islands, in the year 2009, showed resistance to Ceftriaxone.^[5] Ceftriaxone resistant *Shigella* which responded to Meropenem was identified at Sir Ganga Ram hospital, New Delhi in 2011.^[6] In our centre at Government Medical College, Kozhikode, Kerala, a total of 47 *Shigella* species were isolated from fecal samples, since 2010. Out of these, 41 (87.2%) were resistant to Nalidixic acid, 39 (82.9%) were resistant to Trimethoprim/Sulfamethoxazole, 27 (57.4%) were resistant to Ampicillin and 21 (44.6%) were resistant to Ciprofloxacin. These data indicate

high prevalence of MDR strains of shigella in the area. However, the reported case is the first confirmed isolate of *S. flexneri* 2a resistant to Ceftriaxone and susceptible only to Azithromycin.

CONCLUSION

Widespread abuse of antibiotics in our country favors the rapid dissemination of MDR organisms. Though this is the first case of Ceftriaxone-resistant shigella being reported from Kerala, it may pose a serious threat, especially when an incidence of 12% resistance to Ceftriaxone has already been reported from Andaman and Nicobar islands in 2009^[5] itself. A policy for resistance control involving control of drug availability, proper surveillance and discouraging the practice of antibiotic misuse, needs to be evolved.

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