

## Case Report

# Cholera-like diarrhoea due to *Salmonella* infection

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### Abstract

An unusually high number of sporadic cholera outbreaks have occurred in various parts of Kenya since January 2009. Clinical symptoms of cholera play an important role in the diagnosis and management of the disease, especially in resource-poor settings in most developing countries. We describe a case report of a patient who was treated for cholera according to symptoms at presentation to hospital. Non-typhoid *Salmonella* was later isolated and the patient's condition improved after administration of ciprofloxacin.

**Key words:** *Salmonella*; cholera-like diarrhoea; *Vibrio cholerae*

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### Introduction

Cholera disease, which is usually caused by *Vibrio cholerae* O1, is endemic in most of sub-Saharan Africa [1]. The main symptoms of cholera are the massive loss of body fluids through watery diarrhoea, leading to loss of electrolytes and severe dehydration that may result in death if untreated. In resource-constrained countries, clinicians and public health officers rely mainly on symptoms of patients to empirically manage the cases. In this report we emphasize the importance of laboratory-backed diagnosis of diarrhoeal pathogens by reporting a unique case of cholera-like presentation caused by *Salmonella* infection.

### Case report

A 50-year-old man presented with symptoms of profuse watery diarrhoea and vomiting at the Kwale District hospital, Kwale, on 26 June 2009. Kwale is situated about 30 kilometres from the Kenyan coastal city of Mombasa. On examination, the patient was found to be delirious, with a slightly elevated temperature of 38.8°C and he showed signs of significant dehydration. He had recently traveled from Kibera, Nairobi, which is about 600 kilometers from Kwale. Kibera, one of the largest slums in Africa, was at the time experiencing a cholera outbreak. The patient was subsequently admitted and

provided with rehydration fluids intravenously (15 x 500 ml bottles). The patient was also administered flagyl, albendazole, zinc, placil, quinine and doxycycline. A stool sample was taken before the administration of antibiotics and sent to the Centre for Microbiology Research, Kwale station, with a request for confirmation of *V. cholerae*. However, the sample was additionally investigated for diarrhoeagenic parasites and other bacterial pathogens, including *Aeromonas* spp, *Salmonella* spp. and *Shigella* spp. Parasites were investigated by wet preparation. Enrichment was done by inoculating the specimen in alkaline peptone water (APW) and selenite fecal broth (SF). The APW culture was inoculated on Thiosulfate Citrate Bile Salts Sucrose (TCBS) plates after six hours of incubation, while SF broth was inoculated on Hektoen agar and SS plates after 18 hours of incubation at 37°C. Antibiotic sensitivity assay was performed on Mueller Hinton agar plates by employing the Kirby Bauer method [2].

Diarrhoeagenic parasites were not detected. There was no growth on TCBS plates, thereby ruling out the presence of *V. cholerae*. Suspicious non-lactose fermenting colonies from MacConkey, SS and Hektoen agar were identified as *Salmonella* spp. by using API 20E. The strain was sensitive to nalidixic acid, nitrofurantoin, kanamycin,

ciprofloxacin, norfloxacin and cefotaxime. Resistance to tetracycline and azithromycin was observed. The drug regimen was changed to ciprofloxacin on the third day of treatment and the patient's condition improved.

## Discussion

To our knowledge this is the first report of cholera-like diarrhoea caused by non-typhoidal *Salmonella* in the Kenyan Coastal area. The patient had traveled from an area where a cholera outbreak was ongoing. This prompted the health officers to review him as a potential cholera index case. Interestingly, although the patient was administered with antimalarial and antiprotozoal drugs to counter common parasitic infections in the area [3], consideration for possible infection by non-*Vibrio* enteropathogenic bacteria was not recognized. Yet other enteropathogenic organisms had been reported to be endemic in the patient's home area, Kibera, Nairobi [4] as well as at his Kenyan Coastal destination [3,5]. Confirmation of cholera is normally realized by the laboratory isolation of *V. cholerae* from suspected cases.

Cholera is managed by replacing lost fluids and electrolytes, which is achieved by providing oral rehydration salts (ORS) [6]. Doxycycline is administered if there is a need to shorten the duration of the disease as well as to contain the spread of infection [7]. Mixed infections of *V. cholera* O1 and other enteropathogenic microorganisms are not uncommon [8]. We have previously reported a simultaneous outbreak of cholera and dysentery due to *V. cholerae* O1 and *S. dysenteriae*, respectively [9]. Similarly cholera-like diarrhoea caused by organisms other than *V. cholerae* O1 or O139 has been observed [10].

Whereas rehydration of the case patient was of clinical value, the administration of tetracycline was not effective. The *Salmonella* strain was resistant to tetracycline and the infection would have progressed to become more severe or fatal. In the course of cholera outbreaks in Kenya, there is a general tendency to classify all reports of diarrhoea from the affected areas as cholera. Such an assumption will definitely lead to skewed epidemiological data and mismanagement of diarrhoea subjects infected by pathogens other than *Vibrio cholerae* O1. As much as it is crucial to empirically manage cholera cases as soon as possible following suspected cholera outbreaks, we emphasize the importance of making

clinical diagnosis in tandem with laboratory investigations.

Laboratory analysis will detect concomitant infections and any cholera-like diarrhoea caused by non-*Vibrio cholerae* microorganisms. In resource-poor settings, clinical laboratories should be empowered to conduct basic isolation, phenotyping and antimicrobial susceptibility tests, which will provide adequate information for effective response to cholera outbreaks. Any advanced microbial typing can then be addressed by a reference laboratory.

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