

## Extended Abstract

## Gas-producing *Vibrio Cholerae*: A case report of gastroenteritis with acute kidney injury

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### Abstract

We herein report the first case of gas producing *Vibrio cholerae* gastroenteritis with an acute kidney injury. A 30-year-old female presented to the emergency department with complaints of about 10 episodes of watery diarrhea, 4 episodes of vomiting and elevated serum urea/creatinine levels. Although the bacteria were first misidentified as *V. furnissii* by gas production on triple sugar iron agar, it was later confirmed as *Vibrio cholerae* by 16S rRNA gene sequencing and specific PCR. The treatment regimen was followed as for *Vibrio* species with Intravenous fluids, Ciprofloxacin and Doxycycline. The patient recovered without relapse.

Cholera rarely occurs in children under 2 years of age. We describe diarrhea due to *Vibrio cholerae* O139 Bengal, the newly described etiologic agent of cholera in a 4-day-old breast-fed baby. However, the diarrhea was mild and was successfully treated with rehydration therapy and erythromycin.

*Vibrio cholerae* O139 Bengal emerged on the Indian subcontinent in late 1992 and was first recognized in Thailand in 1993. To characterize the epidemiology of this disease, a hospital-based case-control study was conducted in Samutsakorn, a port city 30 km southwest of Bangkok.

Bacterial characterization is important in clinical and epidemiological studies. We herein report the first case of gas-producing *Vibrio cholerae* gastroenteritis with acute kidney injury.

A 30-year-old female presented to the emergency department with complaints of about ten episodes of watery diarrhea, four episodes of vomiting and elevated serum urea/creatinine levels. Although the bacteria were first misidentified as *Vibrio furnissii* by gas production on carbohydrate fermentation and triple sugar iron agar, it was later confirmed as *Vibrio cholerae* by 16 S rRNA gene sequencing and specific PCR. The treatment regimen was followed as for *Vibrio* species with intravenous fluids, ciprofloxacin and doxycycline. The patient recovered without relapse.

Literature survey from database shows no gas-producing *Vibrio cholerae* isolate being reported in the world. Further, genotype studies are warranted to look into the gas production of *Vibrio cholerae*.

*Aeromonas* species have been documented to yield false positive results in microbiological tests for *Vibrio cholerae*. They share many biochemical properties with *Vibrio* species, with which they were jointly classified in the family Vibrionaceae until genotypic information provided New insights. *Aeromonas* species are increasingly associated with gastrointestinal infections, albeit with great apparent variation in pathogenicity and virulence both between and within species of the genus. We report two cases with clinically mild cholera-like symptoms, at a time when a cholera outbreak was unfolding in other regions of the country (Tanzania). These are the first cases to be reported with *Aeromonas* mimicking cholera in our area.

Two patients were admitted at the isolation unit designated by the Kilimanjaro Christian Medical Centre for emerging infectious diseases and provided informed consent about regular stool analysis and culture under the provisional diagnosis of gastroenteritis. The first patient was a 23-year-old black African woman with a 2-day history of watery diarrhea and vomiting associated with a temperature of 39.7 °C. The second patient was a 47-year-old black African woman with a 2-day history of diarrhea and vomiting with a temperature of 37.7 °C, and she was hemodynamically stable. Both patients were isolated in a specific area for infection control and treated with fluids and orally administered rehydration solution, ciprofloxacin, metronidazole, and paracetamol. Stool culture was done. The isolated colonies were reported as *V. cholerae* and transferred to the research laboratory of Kilimanjaro Clinical Research Institute for confirmation using whole genome sequencing. Microbiological testing determined colonies isolated from stool to be *V. cholerae*, and warranted the conclusion "presumptive cholera." Whole genome sequencing, however, established the presence of *Aeromonas caviae* rather than *V. cholerae*.

The co-existence of *Aeromonas* species with *V. cholerae* in cholera-endemic regions suggests the possibility that a proportion of suspected cholera cases may be *Aeromonas* infections. However, with close to no epidemiological data available on *Aeromonas* infection in cases of diarrhea and dysentery in Sub-Saharan Africa, it is not currently possible to establish the extent of misdiagnosis to any degree of certainty. Whole genome sequencing was shown to readily exclude *V. cholerae* as the etiological agent and establish the presence of *Aeromonas* species.