

# *Vibrio cholerae* O1 El Tor from a hilly tribal family in Idukki, Kerala

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## ABSTRACT

*Vibrio cholerae* O1 El Tor Inaba was isolated in 2011 from two related individuals from Anchuruli in the Idukki Dam area near Kottayam, Kerala. This is the first documented report of cholera in a hill tribe in the state, and the rare mode of transmission and its significance is discussed.

**Key words:** Hilly tribal family, O1 El Tor Inaba, *Vibrio cholerae*

## INTRODUCTION

*Vibrio cholerae* is a Gram-negative bacillus with a polar sheathed flagellum that shows darting motility. It produces the cholera toxin (CT) and bears toxin-coregulated pilus (TCP); the toxin binds to the ganglioside receptor in the intestinal epithelium that activates adenyl cyclase. This results in electrolyte imbalance and incapacitating diarrhoea that may be fatal in 50-60% of cases. Generally, it is seen that the El Tor biotype of *Vibrio cholerae* is hardier and survives better than the classic biotype, both biotypes belonging to serogroup O1.

## CASE REPORT

### Case 1

A 38-year-old man was admitted to the Government Medical College, Kottayam (GMCK) with complaints of more than 10 episodes of diarrhoea for 2 days. He was dehydrated and was diagnosed with acute renal failure with a serum creatinine value of 6 mg/dL. Three dialyses were required to bring down his creatinine to normal and his stool was sent for culture to the Microbiology Department at GMCK. Stool culture showed *Vibrio cholerae* O1 El Tor Inaba sensitive to Ampicillin, Co-trimoxazole, Tetracycline and Cefotaxime.

### Case 2

The brother of the individual discussed above also suffered episodes of diarrhoea, but his stool culture was negative for any pathogen. However, his daughter, a 6-year-old, started having diarrhoea the next day. She is a physically and mentally challenged girl who does not leave her room. She recovered after 2 days of diarrhoea. Her stool was sent to GMCK and culture showed *Vibrio cholerae* O1 El Tor Inaba with the same sensitivity.

## DISCUSSION

Past history revealed that the first case had travelled to Manimala, 80 km from his home which is downhill, near the town of Kottayam, and had had food from a local restaurant. On his way back, he suffered several episodes of diarrhoea and was incapacitated on reaching home. He was admitted at a nearby primary health centre (PHC), Kanchiyaar, where a diligent house surgeon, after taking the history of the case, performed hanging drop preparation of the stool and observed the darting motility

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characteristic of *Vibrio cholerae*. The man was then rushed to GMCK.

The PHC at Kanchiyaar sent a surveillance team to Anchuruli, which can be reached only by trekking 3 km across a huge waterfall into the dense forest in the Idukki Dam area and which lies at an altitude of 2,660 feet above sea level. This community is completely cut off from any town and has no electricity. The team did bacteriological analysis of water from the well and a stream that is used by the 20 families in this tribe and found no traces of *Vibrio cholerae*, and thus concluded that the source of the epidemic was the food from downhill Manimala.

The hill tribes, called *Adinasis* or the 'first dwellers', are usually present in the tribal areas of Kerala. This particular tribe dwells in Idukki district which is a hilly area.

Whilst the genus *Vibrio* is known to survive in sea water

and surface water and can get concentrated in shellfish and plankton, domestic transmission is also known to occur through contaminated water and food. This may be due to some initial contamination of food in the house with *Vibrio*. The above case is evidence of such rare modes of transmission of cholera.

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#### **Conflicts of interest**

There are no conflicts of interest.