

# GASTROENTERITIS DUE TO VIBRIO CHOLERAE EL TOR OGAWA

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Mubashir A. Khan, Farrukh H. Azmi, Naubahar Israr, Mohammad Abdur Rab, Jamshaid Iqbal, Abdul Ghafoor, Karamat A. Karamat ( Public Health Division, National Institute of Health, Islamabad. )  
M.I. Bursiey ( PMRC Central Research Centre, National Institute of Health, Islamabad. )

## Abstract

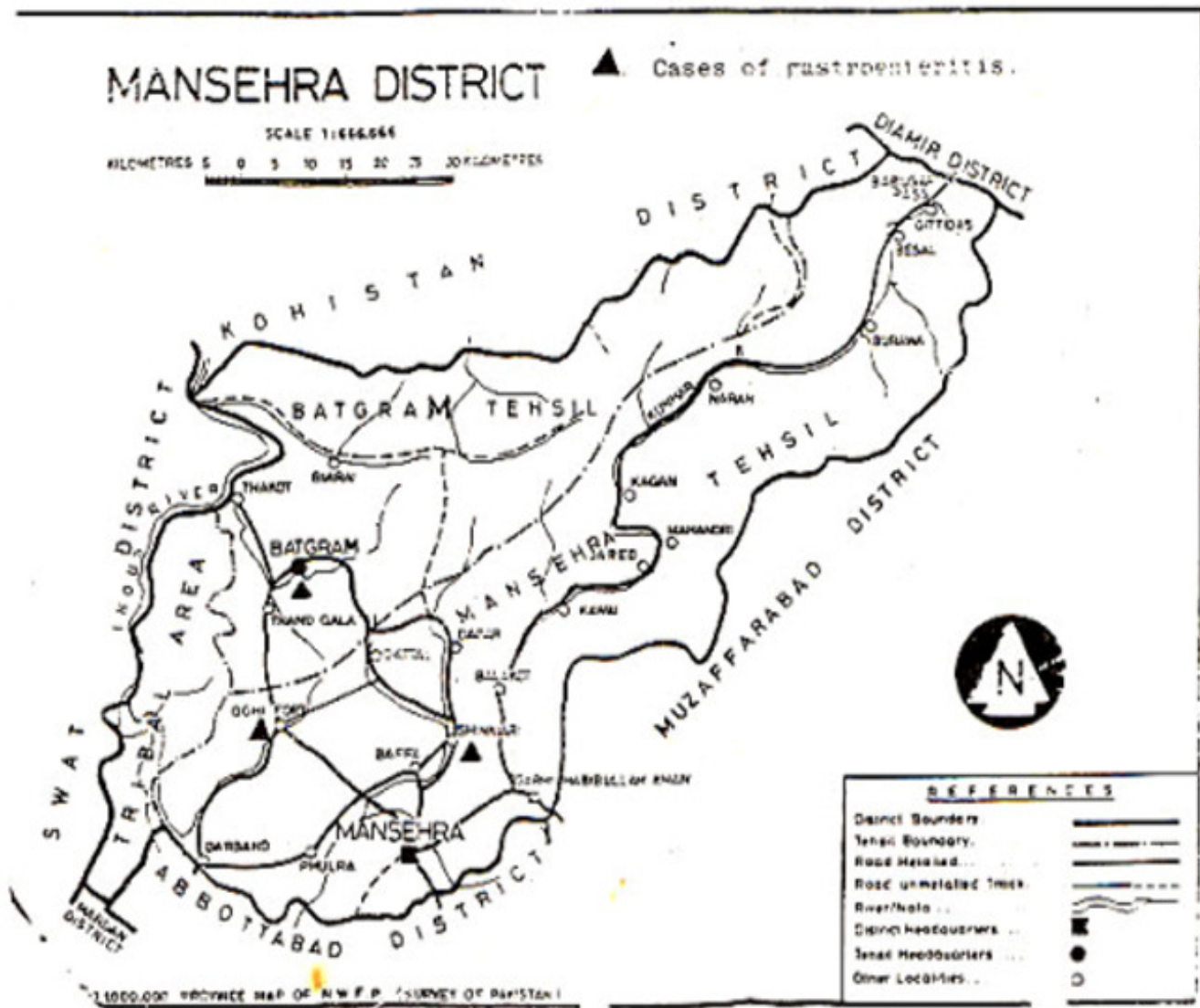
An outbreak of gastroenteritis occurred in District Mansehra of N.W.F.P., Pakistan. Clinically, the cases did not present with a typical picture of cholera. Cases were sporadic with occasional fatal outcome in adults possibly due to treatment failure. Causative agent was identified as *V. cholerae* El Tor ogawa (JPMA 38:170, 1988).

## INTRODUCTION

Epidemiological studies have shown that cholera is responsible for no more than 5-10% of all acute diarrhoea cases in non-epidemic situations and more than 90% of cholera cases are mild and clinically indistinguishable from other acute diarrhea<sup>1</sup>. The global cholera problem at present is almost exclusively caused by the Ogawa and Inaba serotypes of the El Tor biotype of *V. cholerae* 01. Nevertheless, cases due to the classical biotype still occur in Bangladesh<sup>2</sup>. The El Tor biotype appears to have greater "endemic tendency" than classical vibrios as it causes a higher infection-to-case and survives longer in the environment, e.g., in water and nightsoil<sup>3</sup>. The endemicity of *V. cholerae*, El Tor is not known in our country but sporadic cases of gastroenteritis due to this organism are seen in different parts of the country. This study represents the investigations of an outbreak of gastroenteritis which occurred in district Mansehra of N.W.F.P., Pakistan.

## CLINICAL AND EPIDEMIOLOGICAL INFORMATION

In September 1986, an outbreak of gastroenteritis was reported from district Mansehra N.W.F.P., Pakistan. The cases were sporadic, with occasional fatality in adults. 1-2 cases of gastroenteritis were seen daily in most of the basic health units. Two cases were seen in Oghi within '10 km radius, and three were from three villages around Batgram about 30 km from Oghi. There was also a report of gastroenteritis in Shinkiari, however, no case was found during this investigation from this place (Figure 1).



**Figure 1. Cases of gastroenteritis in Mansehra district.**

The patients presented with mild to moderate dehydration, diarrhoea and vomiting, usually starting in the morning. Stools were not characteristically rice wafery but loose and foul smelling. Frequency of stool varied from 2—15/day and of vomitus 2—5/day. Few patients also had abdominal pain and fever (100.102 F). The cases reported were sporadic and not seen in clusters. Enquiries showed that a similar episode occurred in adults 4-5 weeks before the onset of this outbreak with few fatalities. Death usually occurred after 12-18 hours from the onset of symptoms. Active cases of gastroenteritis were thoroughly examined and stool samples obtained for investigations. Samples of drinking water were also obtained from the area for bacteriological analysis.

## **MATERIALS AND METHODS**

### **Collection of Specimens:**

#### **Faeces:**

Faecal specimens of five patients were collected with the help of sterilized Nelaton Catheter (Terumo) and transferred to different media/enrichment broths, e.g., selenite broth alkaline peptone water (pH 8.6), buffered glycerol, and thioglycolate broth with 0.1% agar, and brought to laboratory in a box

containing ice packs.

**Water:**

Three water samples (250ml each) were obtained in sterilized containers from the houses of diseased patients and nearby streams.

Laboratory Investigations:

**Faeces:**

Faecal specimen was analysed for enteric pathogens according to methods described in 'WHO Manual for Laboratory Investigation of Acute Enteric Infections'<sup>4</sup>. **The brief outline is given as follows:-**

**i) Microscopic examination:**

Saline and iodine preparations were examined for parasites.

**ii) Bacteriological analysis:**

Faecal specimens were examined for the presence of Escherichia coli, Salmonella, Shigella, Vibrio cholerae, campylobacter and Yersinia enterocolitica.

**Isolation procedures:**

MacConkey agar plate was inoculated for E.coli, Salmonella and Shigella species. Faecal sample was also inoculated on Thiosulphate citrate bile salt sucrose agar (TCBS) for vibrio cholerae. Yersinia selective agar base was used for Yersinia enterocolitica. Subcultures were made from selenite broth, alkaline peptone water and fluid thioglycollate medium on salmonella shigella agar (SSA), TCBS and Butzler's agar plates (for campylobacter) respectively. Yersinia selective agar base plate was incubated at 32°C while Butzler's agar plate was kept at 43°C. All other plates were incubated at 37°C.

**Identification:**

The suspected colonies on the above mentioned media were identified and characterized by using special differential media, e.g., Triple sugar, Iron agar or through a combination of standard biochemical tests. API rapid system was also used where required. The following specialized determinations<sup>5</sup> were made after preliminary identification.

**i) Salmonella/Shigella:**

Serovarieties were determined by slide agglutination with specific antisera (Difco).

**ii) Enterotoxigenic E. coli:**

Four lactose fermenting colonies (after biochemical identification) were examined for enterotoxin production (LT and ST).

**iii) Enteropathogenic E. coli:**

Sero-groups were first determined by polyvalent and monovalent OK antisera (Difco). The specific 'O' antigen was then detected by tube agglutination test using only 'O' antisera.

**iv) Vibrio cholerae:**

Slide agglutination tests with 01 Inaba and Ogawa antisera (Difco) was done. Haemolysin test was also performed for biotyping of V.cholerae (ELTOR).

**v) Campylobacter:**

Hippurate hydrolysis and other biochemical tests were performed.

**vi) Virological examination:**

Virological investigations were carried out by Electron Microscopy<sup>6</sup>

**Water:**

Water samples were analysed, for the coliforms and other pathogenic organisms, according to W.H.O. criteria.<sup>7</sup> In brief, coliforms were detected by multiple-tube method in which measured volume of sample was inoculated into a series of tubes containing MacConkey broth with durham tube. The 10 ml volume of water was added to the same quantity of double strength medium (5 tubes). One set of five tubes each containing 5ml of single strength broth were inoculated with 1ml volume of water and other set of five tubes were inoculated with 0.1ml volume of water. After incubation at 37°C for 24-48 hrs, acid and gas positive tubes were counted and most probable number (MPN) of coliforms were

obtained.

## RESULTS AND DISCUSSION

*Vibrio cholerae*, biotype EL Tor, Ogawa, was identified as a causative agent in two out of five patients (Table 1).

**Table I. Pathogens found in Faecal Samples.**

Case No	Age	Sex	Village	Results
1.	30 yrs	M	Oghi	No Pathogen
2.	55 yrs	M	Gochi Di Bandi (Oghi)	<i>Vibrio cholera</i> Eltor, Ogawa
3.	19 yrs	M	Shingli Pie (Batgram)	No Pathogen
4.	13 yrs	M	Noshera (Batgram)	<i>Vibrio cholera</i> Eltor Ogawa
5.	90 yrs	M	Poma (Batgram)	No Pathogen

The water samples of the diseased area did not yield any *V. cholerae* El Tor. However, a heavy growth of coliforms (9 18/100 ml) in water indicated faecal pollution which could have acted as a source of infection (Table II).

## Table II. Bacteriological Analysis of Water.

Source	Village	Results
Hand Pump	Oghi	No growth
Stream	Oghi	Coliform (918/100ml)
Well	Oghi	Coliform (918/100ml)

The cases occurred as usual epidemiological features of vibrio El Tor, i.e., sporadic<sup>8</sup>. Clinically the cases did not present the typical cholera like picture, but the outbreak had created panic in the local population being labelled as a mysterious disease. Due to inadequate laboratory facilities in that area the diagnosis of cholera could not be made and, therefore, most of the patients were not treated as cholera<sup>8</sup>. The water supply of the area was found to be heavily contaminated with coliform. The major source of drinking water was mountain streams which were also used as open toilets. This shows the lack of importance being given to the use of clean drinking water. Water can be made safe by boiling or use of chlorine tablets of unusual clinical presentation of cholera and realize their responsibility towards the health of the masses. In majority of the cases, patients were treated over enthusiastically using a wide range of medicines including steroids, antiemetics and antidiarrhoeal (Furoxone, Entox, Flagyl, Intestopan). However, it was observed that few patients were given broad spectrum antibiotics such as chloremphenicol, amoxil or tetracycline. Every effort should, therefore, be made to diagnose clinically and manage the case scientifically.

The results of this study indicate the endemicity of the *V. cholerae* El Tor and draws the attention to provide the clean drinking water to the masses and promote the health education among the population.

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