Case Report

Epidemiological and Clinical Characteristics of 28 Cases of Cholera

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The data of 35 246 patients with intestinal diseases were retrospectively analyzed, 28 cases of cholera patients were screened in 17 years, of which 23 cases had suspicious unclean food history, 10 cases were migrant workers, 8 cases had history of coastal city tour in one week. All of the 28 patients were positive for *Vibrio cholerae* culture, 19 cases were identified as *O1 serotype Ogawa* and 6 were identified as *O1 serotype Inaba*, 3 were identified as *O139*. Twenty-three patients were mild, five cases were moderate, patients with severe diseases were not found. It was found in this study that *O1 serotype Vibrio cholerae* was still dominant, 82% of cholera patients were mild cases. Tourists who had a incompletely heated seafood intake history and migrant people are susceptible to cholera.

Key words: Cholera; Epidemiology; Clinical characteristics

Cholera is a kind of highly contagious infectious disease, 35 246 cases with diarrhea in our hospital from 1995 to 2012 were screened, 28 cases of cholera were detected, the epidemiological and clinical characteristics were summarized as follows.

CASE PRESENTATION

Total of 28 cases of cholera patients in the intestinal clinic from 1995 to 2012 were detected, the diagnosis of all cholera cases were in line with national diagnostic criteria,¹ it included 20 males and 8 females, aged 19-70 years, mean age 32 ± 6.7 years. The epidemiological data was as follows: 10 cases were migrant workers working in Beijing, three cases were transit passengers in Beijing, 8 cases had history of coastal city tour in one week, 7 cases were residents with no travel history. Twenty-three cases had suspicious unclean food history, including 14 patients had eaten seafood outside one week before onset, 2 cases had eaten freshwater snails, fish and shrimp, 6 cases had eaten cold dishes in restaurants and 5 cases with unknown cause. Year of onset: three cases in 1995, two cases in 1996, three cases in 1997, four cases in 1998, three cases in 1999, one case per

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year in 2000, 2001, 2002 and 2004, two cases in 2007, one case in 2009 and 2012, respectively. Seasonal distribution: 2 cases in June, 7 cases in July, 11 cases in August and 8 cases in September.

The main clinical manifestations of patients were shown in Table 1, all patients meet the diagnostic criteria for cholera.²

Stool culture for *Vibrio cholerae* in all of the 28 patients were positive, including 19 cases of *Vibrio cholerae O1 Ogawa*, 6 cases of *Inaba*, 3 cases of *Vibrio cholerae O139*. The results of fecal power test in 8 cases were negative but stool culture were positive, including seven cases of *O1 Ogawa* and 1 case of *O139*.

Symptomatic and supportive treatments were taken to keep water and electrolyte balance, antibiotics were also used. All patients were then admitted to infectious diseases hospital and isolated for medical observation, all of the 28 patients were recovered and discharged finally.

DISCUSSION

Up to now, cholera pandemics have occurred seven times in the world, six pandemics were caused by the classical *Vibrio cholerae*. In 1961, *Eltor Vibrio cholerae* caused the seventh pandemic. The pathogen of seven pandemics were all *Vibrio cholerae O1*.³ In October, 1992, the new outbreak caused by *non-O1*

Table 1. Clinical manifestations of 28 patients with cholera

Clinical manifestations	Cases	Incidences
Diarrhea	28	100.0%
Vomiting	13	46.4%
Abdominal pain	12	42.8%
Fever	8	28.6%
Muscle spasm	3	10.7%
Thirst (dry lips)	6	21.4%
Elevated white blood cell	12	42.9%
Increase in serum BUN	5	17.9%
Decrease in serum K ⁺	7	25.0%
Decrease in CO ₂ CP	4	14.3%
Systolic blood pressure ≤ 90 mm Hg	5	17.9%
Heart rate ≥ 100 beats/min	5	17.9%
Yellow watery stools	16	57.1%
Mushy stools	8	28.6%
Pus and mucus stools	4	14.3%
Fecal leukocytes ≥ 15/HP and the existence of RBC in Fecal	8	28.6%
5/HP ≤ Fecal leukocytes ≤ 15/HP	11	39.3%
Fecal leukocytes < 5/HP	9	32.1%

Table 2. The annual distribution of cholera patients

Year	<i>O1 Ogawa</i>	<i>O1 Inaba</i>	<i>O139</i>
1995	3		
1996	2		
1997	2	1	
1998	3	1	
1999	2	1	
2000	2	1	1
2001			1
2002			1
2003			1
2007	2		
2009			1
2010	1		
2011	1		
2012	1		

Vibrio cholera was discovered in Madras of India and then spread to Asia, America and Europe. In China, the new type of *O139 cholera* was found in Xinjiang Province in 1993, since then it has also been found in Guangdong Province, Zhejiang Province and other provinces. The origin of *O139 cholera* was not clear, researches have shown that *Vibrio cholerae O139* and *Vibrio cholerae O1* have the same virulence genes, external resistance of *Vibrio cholerae O139* was stronger than that of *Eltor cholerae*.⁴ It was speculated that *O139 Vibrio cholerae* may evolved

from *Eltor*,⁵ but there's no evidence showing *Vibrio cholerae O139* will become a new threat.

Through 17 years of intestinal clinic screening, it was found that some new changes emerged in the epidemiological and clinical features of cholera. Outbreak of severe cholera was very rare. Among 28 patients, only five cases met the diagnostic criteria of medium-cholera, the other patients were mild and atypical cases. Four cases had mucus pus and bloody stools. The clinical symptoms and stool examination of 8 patients were

similar to acute dysentery, including four cases of *Ogawa*, two cases of *Inaba* and two cases of *O139*.⁶

However, the number of cases was relatively small, and cases were sporadic, which was consistent with the literature. The overall incidence of cholera had no upward trend. It was mainly occurred in July, August and September. Twenty three cases had suspicious unclean food history, it showed that tourists who had a incompletely heated seafood intake history and migrant people are susceptible to cholera. Most cases were mild cholera patients, which accounted for 82%, there are many reasons for this. Firstly, with the development of our society, the health awareness of general public is strengthened, so the opportunity of *Vibrio cholerae* infection is relatively small. Secondly, variation of some *Vibrio cholerae* strains reduced the virulence. Thirdly, diarrhea patients often use antimicrobial drugs before they were admitted into hospital. It should be noted that the hanging drop test of eight cases was negative, but *Vibrio cholerae* was found in stool culture, which indicated that stool culture is very necessary for cholera screening. It has been reported that the use of molecular biology gene sequencing and genotyping technology can determine subtypes of cholera and identify specific strain. And now, this technology has been used in biological studies of cholera.^{7,8} In recent years, the major cause of several large international cholera epidemics was water pollution, one of the reasons for death was lack of timely treatment. So in the prevention and treatment of cholera, more attentions should be paid

to the epidemic in poor areas and water pollution after flood. On prevention, the world health organization advocates the use of oral cholera vaccine in risk populations, studies showed the protection rate of new oral cholera vaccine was 85%, the protection time can be up to 3 years,⁹ This will play a positive role in the prevention and treatment of cholera.

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