Septicemia Caused by *Vibrio cholerae* O1 Biotype El Tor, in São Paulo, Brazil

Abboud C.S.[1], Ferreira C.E.S.[1], Barbosa V.L.B.[1], Araújo D.A.C.[1], Zandonadi E.C.[1] and Pasternak J.[2]
Insttitute of Cardiology Dante Pazzanese[1]; Albert Einstein Hospital[2]; São Paulo, SP, Brazil

We reported a case of septicemia by *Vibrio cholerae* O1, in São Paulo, Brazil. A 70-year-old male patient, living in an urban area, entered the emergency service having sepsis, dying 12 hours later. Blood culture was positive for *Vibrio cholerae* O1. This is the first case of bacteremia by *Vibrio cholerae* O1 reported in South America.
Key-Words: *Vibrio cholerae* O1, El Tor, septicemia.

Vibrio cholerae is found worldwide in rivers and oceans, which are their natural reservoir. Both O1 and non-O1 vibrios coexist in this environment, with non-O1 non-toxigenic strains prevailing over toxigenic ones.

The ingestion of this pathogen may lead to diarrhea ranging from severe, as in cholera, to mild. They are clinically indistinguishable from (epidemic) cholera itself [1].

Non-O1 and non-O139 *Vibrio cholerae* are not related to epidemics, only sporadic cases having been reported in the literature. Finding this *Vibrio* in blood culture is rare, it happening only in immunosuppressed patients or those with some base disease [2-9].

O-1 and O-139 *Vibrio cholerae* are related to epidemics, O-1 being responsible for the 6 epidemics which occurred between 1817 and 1923 and O-139 being responsible for the epidemic in India and Bangladesh in 1992 [1,10].

The O-1 *Vibrio cholerae* is not considered invasive, and the cases of bacteremia caused by this agent described in the literature are extremely rare [11].

We described in this study the first case of *Vibrio cholerae* O1 biotype El Tor isolated from blood culture in our country. A 70-year-old retired male patient from the city of São Paulo, living in a middle-class urban neighborhood was attended with a clinical condition of mental confusion, cyanosis and dyspnea.

Upon physical examination, he was found to be in bad overall condition, with 4/4+ dehydration, no fever, 100/70 mmHg BP, 105 bpm pulse, peripheral cyanosis, mental confusion and diarrhea when admitted.

Lung auscultation showed diffuse rales and wheezes, and heart auscultation showed hypophonesis.

Abdomen was with diffuse pain. Liver was at 5 cm away from the right costal margin.

Palpable peripheral pulses and lower right limb with pain, heat, rubor and varicose ulcer.

The patient had had acute myocardial infarction 40 days before, having been discharged upon request from the hospital where he was initially treated.

He was a former smoker of 3 packs of cigarettes a day, a former alcoholic (having quit 4 years before). He was hypertense. Denied diabetes and dyslipidemia.

His family said he had not traveled or ingested seafood or poorly washed food, but reported he had bad hygiene habits. He evolved with a worsening of his overall condition, had 39ºC fever, was intubated, dying in the same day.

Positive blood culture for *Vibrio cholerae*.

The etiological diagnosis of *Vibrio cholerae* was made by isolating it in 2 samples of blood culture collected upon admission of the patient. The samples were processed in the automated device *Organon Teknika* BacT Alert®. The sample was sown in blood agar, MacConkey and chocolate agar. Twenty-four hours after incubation, at 35ºC, there was growth of hemolytic colonies in blood agar. The identification of the agent was performed with the automated device *Merieux* VITEK®.

Serotyping was performed, which revealed it to be a *Vibrio cholerae* O1 (PROBAC® Kit).

Considering the importance of the case, both for its epidemiological aspect and for its diagnosis, we opted for genotypical identification of the strain by PCR ("Polymerase Chain Reaction") of the genes that determine unit 16S and later sequencing and comparison with the public database known as "Blast". This revealed it to be a Vibrio cholerae O1 biotype El Tor N16961.

Invasive diseases caused by *Vibrio cholerae* O1 have been related to achlorydria, autoimmune disease and chemotherapy in other publications [11], but in the present case those factors were not present, only an acute myocardial infarction, with no further cause of immunesuppression. The cause of the appearance of this invasive disease was not determined since, apart from the fact that the patient was not immunosuppressed, we are not in period of epidemic cholera and the patient's sanitary and living conditions were good. He had no epidemiological antecedents such as having ingested seafood or raw food and had good socioeconomic condition.

Nevertheless, the *Vibrio cholerae* O1 N16961 isolated in this patient is a potential producer of cholera toxin and highly important epidemiologically. It was responsible for the latest cholera pandemia described in the world, which struck Brazil from 1991 to 1999. Its full genome was described in the year 2000 and considered the starting point for an understanding of how a free-living agent may become a bacterial pathogen

Received on 19 August 2006; revised 4 April 2007.
Address for correspondence: Dr. Cely Saad Abboud. Chief of Infectious Diseases. Instituto Dante Pazzanese de Cardiologia. Av. Dr Dante Pazzanese nº 500. Zip code: 04012-180. Ibirapuera, São Paulo, SP Brazil. E-mail: csa3@terra.com.br. Phone/fax: 011 5085-4255.

The Brazilian Journal of Infectious Diseases 2007;11(2):300-301.

with great clinical significance in humans [12]. The latest literature reports for blood culture isolates of *Vibrio cholerae* O1 were described in 2001, but they belonged to the Ogawa biotype [11].

Considering the epidemiological significance and the difficult diagnosis, even for confirmation of the case, it is extremely important for health services to be alert to identify, diagnose and treat such cases and notify sanitation authorities of their occurrence.

References

1. Neill M.A., Carpenter C.C.J. Other Pathogenic Vibrios In: Mandell G.L., Bennett J.E., Dolin R. Principles and practice of infectious disease, 5th ed.Churchill Livingstone, **2000**.
2. Thomas, Maya D.C.H.; Cherian, Thomas M.D., Raghupathy, P. M.D. *Vibrio cholerae* bacteremia and peritonitis in a patient with nephrotic syndrome. The Pediatric Infectious Disease Journal.
3. Berghmans T., Crokaert F., Sculier J.P. *Vibrio cholerae* bacteremia in a neutropenic patient with nonsmall-cell lung carcinoma; Eur J Clin Microbiol Infect Dis **2002**;Sep 21(9):676-8.
4. Ismail E.A., Shafik M.H., Al-Mutairi G. A case of non-O:1 *Vibrio cholerae* septicemia with meningitis, cerebral abscess and unilateral hydrocephalus in a preterm bab; Eur J Clin Microbiol Infect Dis **2001**;Aug 20(8):598-600.
5. Suankratay C., Phantumchinda K., Tachawiboonsak W., Wilde H. Non-serogroup O:1 *Vibrio cholerae* bacteremia and cerebritis; Clin Infect Dis **2001**;Apr 1 32(7):E117-9.
6. Fernandez J.M., Serrano M., De Arriba J.J., et al. Bacteremic cellulitis caused by non-01, non-0139 *Vibrio cholerae*: report of a case in a patient with hemochromatosis; Diagn Microbiol Infect Dis **2000**;May 37(1):77-80.
7. Halabi M., Haditsch M., Renner F., et al. *Vibrio cholerae* non-01 septicaemia in a patient with liver cirrhosis and Billroth-II-gastrectomy. J Infect **1997**;Jan 34(1):83-4.
8. Lin C.J., Chiu C.T., Lin D.Y., et al. Non-01 Vibrio cholerae bacteremia in patients with cirrhosis: 5 yr experience from a single medical center. Am J Gastroenterol **1996**;Feb 91(2):336-40.
9. Kontoyiannis D.P., Calia K.E., Basgoz N., Calderwood S.B. Primary septicemia caused by *Vibrio cholerae* non-O1 acquired on Cape Cod, Massachusetts. Clin Infect Dis **1995**; Nov 21(5):1330-3.
10. Sack DA, Sack RB, Nair GB, Siddique AK. Cholera. Lancet **2004**;363:223-33.
11. Gordon M.A., Walsh A.L., Rogerson R.K., et al. Three cases of bacteremia caused by Vibrio cholerae O1 in Blantyre, Malawi. Emerging Infect Dis **2001**;7(6):1059-61.
12. Heidelberg J.F., Eisen J.A., Nelson W.C., et al. DNA sequence of both chromosomes of the cholera pathogen *Vibrio cholerae*. Nature **2000**;406(6795):469-70.