CASE REPORT

NON-0:1 *VIBRIO CHOLERAE* SEPTICEMIA IN THALASSEMIA PATIENTS

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Non-0:1 *Vibrio cholerae* organisms are morphologically and biochemically indistinguishable from *Vibrio cholera* serogroup 0:1 but do not agglutinate in vibrio group 0:1 antiserum. Non-0:1 *V. cholerae* is not able to induce large epidemics of cholera-like disease, except in the case of the recently described *V. cholerae* 0:139 (Cholera Working Group, 1993). In many parts of the world, these organisms have been associated with sporadic outbreaks of gastrointestinal illness ranging from mild watery diarrhea to febrile enterites with bloody diarrhea (Morris *et al,* 1981). In contrast to *V. cholerae* 0:1, which only rarely causes infection outside the gastrointestinal tract (Morris and Black, 1985), Non-0:1 *V. cholerae* has been associated with systemic infection, particularly in the immunocompromised host (Safrin *et al,* 1988). Non-0:1 *V. cholerae* bacteremia is rare. We report two cases of Non-0:1 *V. cholerae* septicemia in thalassemia patients.

Case 1: This was a 17-year-old man with compound heterozygosity for codon 17 (A → T) and uncharacterized beta thalassemia mutations. He attended the Hematology Clinic, Department of Pediatrics, Faculty of Medicine, Prince of Songkla University, from the age of 7 years. Splenectomy was done at the age of 14 years due to hypersplenism. He received oral penicillin prophylaxis and was doing well after the splenectomy. But then he had fever and watery diarrhea for 1 day; he was brought to the emergency room with cardiac arrest and did not respond to resuscitation. He died about 1 hour later. His blood and stool grew *Vibrio cholerae* Non-0:1.

Case 2: This was a 10 year-old-boy with compound heterozygosity for a 4 basepair deletion in codons 41/42 (-CTTT) and ATA nt-28 (A → G) mutations. He attended our Hematology Clinic since the age of 1 year. He required packed red cell (PRC) transfusion with an average of 240 ml/kg/year during the last 2 years prior to splenectomy. Splenectomy was done at the age of 5 years due to hypersplenism. After splenectomy he received oral penicillin prophylaxis for 3 years and needed less PRC transfusion (about 64 ml/kg/year).

He was admitted with high fever, vomiting, abdominal pain and watery diarrhea for 1 day. On arrival at the hospital he looked sick with mild dehydration. His temperature was 39.7°C, pulse 120 beats/minute, blood pressure 110/60 mmHg and respiratory rate 35 /minute. Examination revealed moderate pallor, mild icteric sclerae, mildly distended abdomen, generalized tenderness and guarding at right lower quadrant. Bowel sounds were hypoactive. The liver could not be palpated because of abdominal tenderness. Rectal examination showed normal sphincter tone, no abnormal mass and no definite point of tenderness. Stool examination revealed watery yellowish color with no red or white blood cells. Initial laboratory studies revealed serum sodium 137 mmol/l, potassium 4.5 mmol/l, bicarbonate 22 mmol/l, chloride 99 mmol/l, blood glucose 94 mg/dl, blood urea nitrogen 13.2 mg/dl, creatinine 0.55 mg/dl, albumin 4.7 g/dl, globulin 3.2 g/dl, total bilirubin 2.1 mg/dl with 0.73 mg/dl direct bilirubin, SGOT 137 IU/l, SGPT 119 IU/l and alkaline phosphatase 483 IU/l. The hemoglobin was 7 g/dl, hematocrit 20 vol%, and white blood cell count 86,900 cells/mm^3 with 71% neutrophils, 1% band form, 1% myelocyte, 3% eosinophils and 24% of lymphocytes. Platelet count was 517,000 cells/mm^3 and nucleated red blood cells (NRC) were found to be 243 per 100 WBC. The diagnosis of peritonitis was made and exploratory laparotomy was done on that day. The operative findings showed inflammation at the terminal ileum and appendix. Turbid fluid without

foul smell was found in the abdominal cavity, about 50 ml showing numerous white blood cells. Appendectomy was done and the pathological feature showed acute periappendicitis. He was treated with fluid replacement for dehydration and parenteral ampicillin (150 mg/kg/d), gentamicin (5 mg/kg every 8 hours) and flagyl (10 mg/kg every 8 hours). He responded very well, his temperature was 37°C and there was no diarrhea on the next day. Stool and blood culture grew *Vibrio cholerae* Non-0:1 and Non-0:139 which were sensitive to ampicillin, gentamicin, norfloxacine, cotrimoxazole, tetracycline and cephalosporins. Peritoneal fluid was negative for pathogenic organisms. He received ampicillin and gentamicin for 10 days and flagyl for 5 days. Repeat blood culture was negative for *V. cholerae* on the third day. Stool culture was still positive for *V. cholerae* on day 7 but was negative on day 11. He made good progress and was discharged on the eleventh hospital day.

Non-0:1 *V. cholerae* bacteremia has been described in normal hosts, young children and immunocompromised hosts (Safrin *et al,* 1988; Thisayakorn and Reinprayoon, 1990; Thamlikitkul 1990; Blanche *et al,* 1994), including patients with cirrhosis, leukemia, lymphoma, malnutrition, cholelithiasis and biliary disease, AIDS and thalassemia diseases. The case fatality rate in septicemia patients is as high as 63% (Blanche *et al,* 1994). *V. cholerae* Non-0:1 septicemia in thalassemia patients was reported in 1990 (Thisayakorn and Reinprayoon, 1990). The clinical features of thalassemia patients who had Non-0:1 *V. cholerae* and *V. cholerae* Non-0:1 and Non-0:139 septicemia are shown in Table 1. All of the thalassemia patients underwent splenectomy 3-5 years before. Previously analysis of 2,795 splenectomized patients of all ages, both sexes, and varying diagnosis revealed that the mortality from postsplenectomy sepsis was increased. Patients splenectomized for hematological disorders had an 800 fold increase in sepsis (Heier, 1980). If splenectomy is carried out during the first year of life, the chance of having postsplenectomy sepsis is about 20-50%. Even in patients splenectomized between the age of 1 and 16 years the frequency of such infections has been reported to be 9-20% (Heier, 1980). Infection is the most common cause of death in splenectomized thalassemic patients (about 62%) (Fucharoen *et al,* 1988). The increased risk of postsplenectomy sepsis is related to loss of mechanical filtration and various immunological deficiencies, which include decreased properdin concentration, reduced alternate complement pathway activity, decreased serum IgM, decreased opsonin concentration, decreased cytophilic globulin or hemocytotropic antibody and reduced levels of tuftsin (Likhite, 1976). Patients with liver dis-

Table 1

Clinical features of thalassemia patients with Non-0:1 *V. cholerae* septicemia.

	Case1[a]	Case 2	Case 3[b]
Age (years)	15	17	10
Sex	F	M	M
Thalassemia diseases	β Thal Hb E	homozygous β Thal	homozygous β Thal
Years after splenectomy	3	3	5
Fever	Yes	Yes	Yes
Watery diarrhea	Yes	Yes	Yes
Vomiting	Yes	No	Yes
Abdominal pain	Yes	No	Yes
Shock	Yes	Yes	No
Peritonitis	Yes	N.A.[c]	Yes
Stool culture	negative	positive	positive
Outcome	survived	died	survived

[a] Thisayakorn and Reinprayoon, (1990).
[b] Blood and stool grew *V. cholerae* Non-0:1 and Non-0:139.
[c] N.A. = not applicable.

ease and chronic iron overload are susceptible to primary septicemia with *Vibrio vulnificus* (Bullen *et al,* 1991). A severe degree of hemosiderosis and cirrhosis is found in liver cells in thalassemic patients. The amount of iron in liver cells is variable, dependent on age and the absence or presence of the spleen (Sonakul *et al,* 1988). The relation between Non-0:1 *Vibrio cholerae* septicemia and thalassemia disease should be carefully observed.

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