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A CASE OF AN INVASIVE *VIBRIO CHOLERAE* NON-O1/O139 SEPTICEMIA IN A POST SPLENECTOMY THALASSEMIC MAJOR PATIENT.

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ABSTRACT

Invasive extra-intestinal infections with *Vibrio cholerae* non-O1/O139 are rare. We report a case of adult with thalassemia major status post-splenectomy, presenting with *V.cholerae* non-O1/O139 *V.cholerae* gastroenteritis with concomitant septicemia. The pathogen was isolated from blood culture and the patient recovered uneventfully after appropriate therapy.

Key words: *V.cholerae*, septicemia, thalassemia, splenectomy.

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ABSTRACT

Invasive extra-intestinal infections with *Vibrio cholerae* non-O1/O139 are rare. We report a case of adult with thalassemia major status post-splenectomy, presenting with *V.cholerae* non-O1/ O139 *V.cholerae* gastroenteritis with concomitant septicemia. The pathogen was isolated from blood culture and the patient recovered uneventfully after appropriate therapy.

Key words: *V.cholerae*, septicemia, thalassemia, splenectomy.

INTRODUCTION

Vibrio cholerae are Gram negative, oxidase positive, comma shaped bacteria with darting motility are generally considered as non-invasive, causing gastroenteritis of varying severity. *V.cholerae* strains agglutinating with O1 and O139 antisera cause toxin-mediated acute diarrhea, cholera.

Vibrios that are biochemically similar to *V.cholerae* but that do not agglutinate *V.cholerae* O1 and O139 antiserum are taxonomically included in the species *V.cholerae* and are referred to as non-O1/O139 *V.choleare*.[1] Non O1 *V.cholerae* organisms are worldwide in distribution and ubiquitous in water sources. Unlike *V.cholerae* O1 and O139, non-O1 strains have not been observed to cause sweeping epidemics.[1] Sporadic cases result from the ingestion of very large inocula from contaminated water, consumption of raw sea food and exposure of damaged skin to contaminated salt or river water.[1,2]

But non O1 *V.cholerae* organisms can produce a wide spectrum of diarrheal illness ranging from severe watery diarrhea indistinguishable from cholera to the milder traveler's diarrhoea.[1] They have been also rarely associated with wound infection, peritonitis, cholecystitis, ear infections, cellulitis, necrotizing fasciitis, endophthalmitis and septicemia with meningitis in patients with predisposed conditions like liver diseases, renal impairments, malignancies or immunosuppression but occasionally in normal immunocompetent persons too.[1-4] Mortality rate from invasive infection ranges from 23.8% to 61.5% as observed in other review studies.[3, 4]

We report a case of *V.cholerae* non-O1/O139 septicemia in a patient with thalassemia major in Brunei Darussalam, which is rare in this geographical area.

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CASE REPORT

A 35years male, thalassemia major patient who has undergone splenectomy 6 years back presented with 2 days history of fever with rigors, abdominal pain, mild diarrhea and jaundice. On physical examination patient was febrile, his abdomen was soft and distended with generalized tenderness. Any surgical etiology was excluded by abdominal x-ray, chest x-ray and Focused assessment and sonography in trauma (FAST) scan. His white blood cell count was very high (81.9x10 ^{9} /L) with 92.8% neutrophils), C reactive protein was 37.87mg/dl with total bilirubin level of 207.2µmol/L. A clinical diagnosis of septicemia with acute gastroenteritis was made and he was commenced on ceftriaxone 2g 12hourly, ciprofloxacin500mg 12 hourly and metronidazole 500mg 8 hourly intravenously.

The blood culture sent on the day of admission isolated oxidase positive, Gram negative slender comma shaped bacilli. Yellow colonies on thiosulphate citrate bile-salts sucrose (TCBS) medium (Figure 1a &1b) and late lactose fermenting colonies on Mac Conkey's medium (Figure 2) were observed. These colonies were mucoid and hemolytic on blood agar plates. Though the isolated bacteria from direct plates and from alkaline peptone water showed motility by hanging drop method, the typical darting type of motility was not observed.

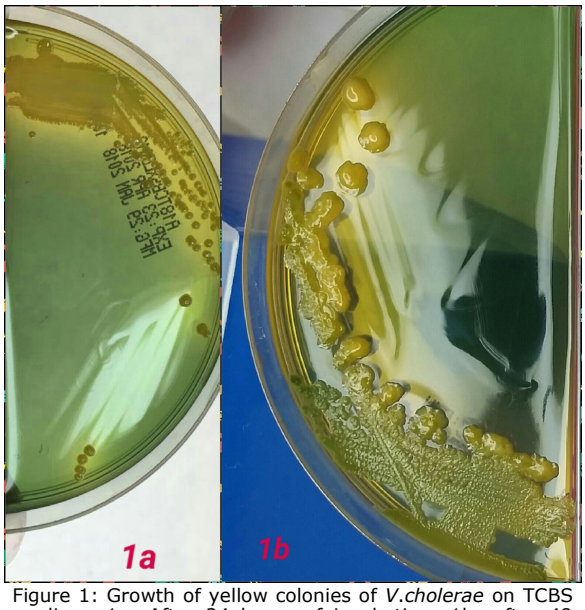

Figure 1: Growth of yellow colonies of *V.cholerae* on TCBS medium. 1a: After 24 hours of incubation; 1b: after 48 hours of incubation.

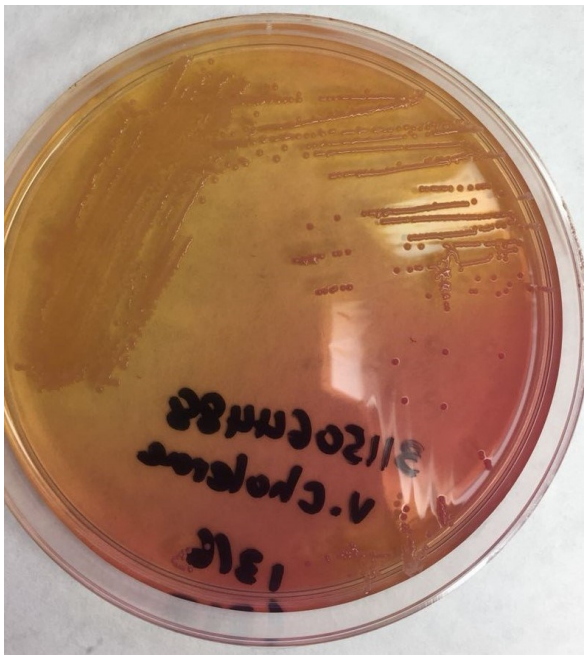

Figure 2: Growth of *V.cholerae* on Mac Conkey's medium, after 24hours of incubation.

The organism was identified as *V.cholerae* by VITEK 2XL®, VITEK MS, Analytical profile index (API) 20E (BioMerieux). Growth on cysteine lactose electrolyte deficient (CLED) medium (Figure 3) ruled out any possibility of halophilic vibrio and *V.mimicus* was ruled out by the growth of yellow colonies on the TCBS and thus, further confirming the identification as *V.cholerae*. Remel ™ thermoscientific antisera for O1 and O139 serogroups were used in the standard slide agglutination method and the isolate was serogrouped as non-O1/O139.

Antibiotic susceptibility done using VITEK 2XL®, Kirby Bauer disk diffusion and Minimum Inhibitory Concentration (MIC) by Epsilometer (E strip). The isolate tested susceptible to cefuroxime, ceftazidime, ciprofloxacin, tetracycline, doxycycline, azithromycin, co-trimoxazole, chloramphenicol, carbapenems, amikacin, and gentamicin, inter-

Figure 3: Growth of *V.cholerae* on cysteine lactose electrolyte deficient (CLED) medium, after 24 hours of incubation.

mediate to ampicillin, based on the Clinical Laboratory Standard Institute (CLSI) 2012 criteria indicated in document MS4-A2. [5] The isolate was forwarded to molecular identification at scientific laboratory Brunei Darussalam, and it was re-confirmed as *V.cholerae* by the Polymerase Chain Reaction (PCR, BAX®Q7). Unfortunately, his stool culture was not done on admission, but rectal swab culture done on the 3rd day of admission, did not grow *V.cholerae* or other gastric pathogens.

Patient's antibiotics were reviewed following the laboratory confirmation of identity of the isolate and antibiotic sensitivity pattern on the fourth day of admission. IV ceftriaxone and metronidazole were discontinued. Oral doxycycline was added 200mg stat dose was followed by 100mg twice daily to IV ciprofloxacin.

Patient's repeat blood culture after 6days came as negative. Patient was discharged on the 8th day of admission with oral doxycycline and oral ciprofloxacin for one week. Review after one week was uneventful.

DISCUSSION

In general, non-O1/O139 *V.cholerae* is non-pathogenic or asymptomatic colonizer in humans, or cause mild, sporadic illness such as gastroenteritis, wound or ear infections in otherwise healthy hosts. However, in persons who are immunocompromised or who have underlying liver disease, non-O1/ O139 *V.cholerae* strains can cause severe wound infections, septicemia, peritonitis, celebrities with associated high mortality rate.[3,4,6]

Non-O1/O139 *V.cholerae* septicemia has been reported in cirrhotic/liver disease patients from Thailand, China and various other parts of the world.[6, 7 8]. This is the first symptomatic case to be reported from Brunei Darussalam. Our patient had thalassemia major with splenectomy. Punpanich et al from Thailand has reported a case of invasive *V.cholerae* in a child with thalassemia.[9] Immunosuppression along with decreased bactericidal activity with or without impaired liver function can lead to invasion of the blood stream by an essentially intestinal pathogen as seen in this case. Our patient had mild diarrhea to start with, though the organism was not isolated from the rectal specimen.

The isolate was susceptible to most of the antibiotics tested except ampicillin. A report from Kolkata, India by Datta et al shows high resistance in *V.cholerae* non-O1/O139 for Co-trimoxazole and fluoroquinolones like nalidixic acid.[10] This isolate was susceptible to two ideal drugs doxycycline and ciprofloxacin which were used for the treatment for this patient.

The source of this organism can vary. Usually patients with non-O1/O139 *V.cholerae* infections present with history of consumption of raw sea food or any contact with the food or contaminated water. In our case patient denied the history of recent exposure or drinking river/sea water and raw or undercooked sea food. But two days prior to this

episode he ate chicken and coffee with ice at a river side restaurant. Because non-O1 *V.cholerae* organisms exist in a variety of water sources ranging from freshwater rivers to salt water oceans, purification of water sources and adequate cooking of fish and other seafood provide the only certain protection against infections by these occasional pathogens.[1]

Since most of the reported cases of non-O1/O139 *V.cholerae* infections were in patients with liver disease or hematological abnormalities and taking the high mortality in consideration, patients should be warned about the potential dangers of consuming raw or undercooked sea food as well as avoiding the exposure of wounds to sea or river water.

CONCLUSION

This study emphasize the need for high degree of clinical suspicion, as in this case the diagnosis was entirely made by laboratory findings. Diagnosis of *V.cholerae* sepsis can be a challenge because of its uncommon nature. It is important for physicians to consider this organism as possibility in patients with underlying factors, namely immunocompromised or splenectomised patients, with the history of diarrhea with or without recent seafood ingestion.

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CONFLICT OF INTEREST: On behalf of all authors, the corresponding author states that there is no conflict of interest.

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