CASE REPORT

Non O1, non O139 Vibrio cholerae bacteraemia in an infant; case report and literature review

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Abstract

Non 01, Non O139 Vibrio cholerae bacteraemia is a rare but potentially fatal occurrence. There have been very few incidents of this infection from around the world. The treatment regimen of antibiotics also varies in literature. We present a case of bacteraemia caused by Non O1, Non O139 Vibrio cholerae along with associated risk factors, disease manifestations, laboratory diagnosis and treatment regimen. This serves to add additional information regarding symptoms and signs of this infection along with management of patient. Knowledge regarding this topic shall be highly useful to professionals if further cases are detected. In the discussion section, a review of literature of previous cases is also presented.

Keywords: Vibrio cholera, Bacteraemia, Non O1, Non O139, Pakistan.

Introduction

Vibrio cholerae is a gram negative oxidase positive bacterium. Its O1 and O139 serotypes are notorious for causing epidemics and pandemics of severe watery diarrhoea known as cholera. Strains that do not agglutinate with O1 and O139 antisera are known as non O1, non O139 Vibrio cholerae species. These strains — although can also cause diarrhoeal illness, are reputable more due to their extra intestinal manifestations — most prominent of which is bacteraemia. Non O1, non O139 bacteraemia is rare and very few cases of it in infants has been presented in the previous literature.

Case Report

A two-month old baby boy presented with a 10-day history of fever and abdominal distension. He had abdominal pain for the past 3 days and was taken to a local doctor who administered a single dose of metronidazole. However, the condition of the baby worsened and the infant became lethargic. After which he was subsequently brought to a tertiary care hospital.

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Within a span of one month he was admitted thrice. He had an uneventful antenatal history with an emergency caesarian section. He was born with bilateral lamellar cataract. His birth weight was 3.5 kg and he had neonatal jaundice on the third day of birth. On 19th day his weight increased by 200grams.

On his third visit, on examination he was found to be drowsy with a temperature of 38°C, a heart rate of 160 beats per minute and a respiratory rate of 35 breaths per minute. His oxygen saturation was 98 percent.

He also appeared anaemic and had jaundice along with pitting oedema.

On Cardiovascular system examination S1 and S2 were audible while pulses and perfusion were poor. Glasgow coma scale revealed a 14/15 score. Abdomen was tense, distended with a positive fluid thrill. He also had hepatomegaly, splenomegaly, oedematous skin with an everted umbilicus and sluggish bowel sounds. Chest X ray was clear. The patient was started on cefotaxime, amikacin and vitamin K and a nasogastric tube was inserted.

Ultrasound showed dilated bowel loops. Blood cultures were sent. Gram stain revealed curved gram negative rods. After 24 hours of incubation, growth of beta haemolytic colonies were noted on sheep blood agar. On MacConkey agar there was growth of non-lactose fermenters that were oxidase positive. Hanging drop showed darting movements. On Thiosulfate- citrate- bile salts- sucrose (TCBS) agar there was growth of yellow colonies that were opaque in center and pale at periphery. API-20E (bioMérieux) confirmed identification of Vibrio cholera while slide agglutination tests were negative for O1 and O139 antigens.

On third day of admission the patient started to have symptoms of respiratory distress. Abdominal swelling increased and patient became drowsy with laboured breathing. Oxygen saturation reduced to 84% from 95%. Parents were advised for intubation. However, they refused and due to poor prognosis, withdrew support.

Consent from parents was taken prior to the writing of the

Table: Non-O1, non O139 Vibrio cholerae bacteraemia reported in recent English literature that were available as full article by a Pubmed search of 'Vibrio Cholerae and bacteraemia'.

Study	Region	Age	Gender	Underlying pathology/ comorbidity	Suspected source	Clinical features	Treatment	Outcome
Rubin et al, 19819	USA	3 weeks			Infant's bottle was kept in a container of live crabs	Bacteraemia, Meningitis	Ampicillin, gentamicin	Severely neurologically impaired at 6 months
Naidu et al, 19938	USA	6 weeks	M		Fish was cleaned in the same sink where baby bathed	Bacteraemia, Meningitis	Cefotaxime, gentamicin	Death
Ismail et al, 20017	Kuwait	60 hours	Male	Premature baby, low birth weight	Mother consumed fish in the week before delivery	Septicemia, Meningitis, Cerebral abscess, Unilateral hydrocephalus	Ampicillin, cefotaxime	He was discharged at 24 days of age as neurological examination was unremarkable. But developed cardiorespiratory arrest and died.
Kerketta et al, 20026	India	10 days	M		Cow's milk	Septicemia, meningitis	Ampicillin, cefotaxime	Left against medical advice. Condition improved
Hao et al, 201510	China	11 days	F		Contaminated food and paraphernalia	Septicemia, meningitis	Sulbenicillin, metronidazole	Resolved with some neurological deficits
Sarwar et al, 20155	Pakistan	3 days	M	Very low birth weight,	Goat's milk	Bacteraemia		Death after 15 days

manuscript. Ethical review committee granted us permission to publish this research.

Discussion

Non O1 and non O139 Vibrio cholerae have been known to cause extra intestinal disease in adults with underlying malignancies, chronic syndromes, renal dialysis, liver pathologies, post-transplants and immunosuppressive disorders.[1] Previously it is well established that chronic liver disease is one of the most prominent predisposing factor for systemic bacterial infections. It has been postulated that increased infection in cirrhotic patients may be attributable to a defective reticuloendothelial system leading to increased survival of bacteria in the bloodstream.[2] This patient was admitted with hepatosplenomegaly, jaundice and ascites which suggests that maybe he was syndromic or suffering from primary immunodeficiency. Unfortunately, during his hospital stay he was not investigated in that direction.

Infantile Non O1 and non O139 Vibrio cholera infections are a rare entity. There have only been a few such cases reported in literature. Previous case reports (Table-1) suggests a strong association with meningitis in infants and a high mortality and morbidity rate. It is therefore imperative that early diagnosis be made and early intervention in the form of intravenous antibiotics should be started.

Unlike their O1 and O139 counterparts, non O1 and non O139 Vibrio cholera do not produce the cholera toxin. They are hence termed as non-toxigenic. The virulence factors for non-toxigenic Vibrio cholera have not yet been well established. Haemolysin, which would explain the invasive nature of these bacterium appears to be the most likely candidate in these serotypes.[3] Cytotoxic and haemolytic activity has been previously demonstrated in a Non-O1 strain causing bacteraemia in a patient.[4] It has also been postulated that the invasive nature of the bacteria can be attributed to a toxin named the zot toxin which functions by disabling the tight junctions between the epithelial cells of the intestine.[5]

Infections in humans arise most commonly due to ingestion of contaminated water and raw or undercooked seafood. Foreign travel to endemic regions and contact of contaminated water with broken skin are also known risk factors. In infants, sterility of artificial feeds and cleanliness of bottles are highly recommended and reinforced by Kerketta et al.[6] In neonates, we may also consider perinatal infections from maternal faecal flora as well as low birth weight[5] and prematurity.[7] The source of infection in this case could not be ascertained though it is possible the child may have ingested polluted water.

As reported previously the disease may present as fever, chills, lethargy, irritability and refusal to feed.[5-10] Generalized convulsions have also been reported.[6-10] It is important to note the absence of diarrhoeal disease in both, previous literature as well as this case report. This patient presented with abdominal distension that was probably associated with coexisting pathology. The patient reported by Kerketta[6] also developed metastatic endopthalmitis.

Antibiotic susceptibilities vary in different reports.

However, the organism is most commonly found sensitive to ampicillin and cefotaxime.[7] Antibiotic sensitivity is also observed in aminoglycosides, fluoroquinolones and chloramphenicol.[6,9,10]

Table lists down salient features of published case reports in recent years.

Conclusion

Through this communication, we are reporting a life-threatening condition due to a non O1, non O139 Vibrio cholera. Therefore,we suggest that clinicians should always be vary of such infections in extremes of ages and immunocompromised states.

Disclaimer: This article has not been presented or published in a conference.

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