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Case Report

Non-O1 *Vibrio cholerae* bacteremia in an infant, first case report from Pakistan

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Abstract

To the best of our knowledge, Non-O1 *Vibrio cholerae* (NOVC) bacteremia has never been documented in Pakistan. This case report is the first reported case of bacteremia in an infant due to NOVC in Pakistan. A neonate was admitted to a hospital with fever and no history of diarrhea. The isolate was identified biochemically and serologically and was sensitive to all the drugs tested as per CLSI 2014 guidelines.

Key words: bacteremia; infant; non-O1 *Vibrio cholerae*

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Introduction

Vibrio cholerae, a gram negative curved rod is known to cause non-invasive diarrheal infection. In the past two decades, invasive infections of *Vibrio cholerae* have been more commonly reported. The exact mechanism of invasion is still unclear but it has been postulated that a toxin known as zot toxin is responsible for disassembling tight intercellular junctions in small intestine and subsequent invasion by *Vibrio cholerae* [1]. Only some strains of *Vibrio cholerae* are reported to cause invasive infections. The ratio of invasive infections caused by Non-O1 and Non-O139 strains of *Vibrio cholerae* is considerably higher than O1 and O139 *Vibrio cholerae* strains.

Case Report

Male twins were born in a hospital in Faisalabad, Pakistan in May 2014 by normal vaginal delivery. The pregnancy was full term and the mother was fine when she delivered. One of the neonates was a healthy 6 lbs. in weight. The other neonate weighed only 3 lbs. The neonates were not breastfed; instead they were fed with goat milk (boiled or raw-not known) for the first two days. On the third day, the lower birth weight neonate was hospitalized with history of fever and chills. The patient did not present with diarrhea, hence stool sample escaped any investigation. A blood sample was however, drawn from the patient for culture. The patient was then started on broad-spectrum antibiotics on an empirical basis. The BACTEC 9050 system (BD Becton, Dickinson and Company, Franklin Lakes, USA) alerted positivity after 8 hours of incubation (. The sample was sub-cultured on 5% sheep blood and MacConkey agars at 37°C. A pure growth of non-swarming, non-lactose fermenting gram-negative curved rods was obtained. The isolate showed shooting star motility by the hanging drop method. Because of this important finding of motility, the isolate was sub-cultured on TCBS agar. After overnight incubation, the isolate showed yellow sucrose fermenting growth. The isolate was then subjected to identification by API 20E and API 20 NE. The results of the biochemical tests are shown in Table 1. The phenotypic characterization was followed by serological diagnosis. The organism showed no agglutination, what so ever, with O1 and O139 antiserum (Difco Laboratories, Franklin Lakes, USA) and was proved to be Non-O1 *Vibrio cholerae* by exclusion. The positive control was run in parallel. The isolate was sensitive to ampicillin (30µg), azithromycin (30µg), doxycycline (30µg), ciprofloxacin (10µg) ofloxacin (10µg) and trimethoprim/sulfamethoxazole (SXT) (25µg) by Kirby-Bauer disk diffusion method

according to the Clinical and Laboratory Standards Institute (CLSI) document M100-S24 [2]. The neonate died 15 days after birth while the other continues living healthily.

Discussion

In this case report the source of infection remained unclear. The infrequent isolation of Non-O1 *Vibrio cholerae* from blood makes it difficult to establish possible sources of infection and exact mechanism of disease. Goat's milk, probably not boiled and low birth weight of neonate seems to be contributing factor in this case. In the past eight cases of bacteremia caused by *Vibrio cholerae*-O1 have been reported from Sindh, Pakistan with 75% incidence rate in children [3]. However, bacteremia caused by NOVC was never documented in past in Pakistan.

In most of the cases of NOVC bacteremia, documented in the past from outside Pakistan, patients showed history of an underlying disease like cirrhosis [4], nephritic syndrome [5] and Fanconi anaemia [6] predisposing patients to infection. However, in this case no such history was apparent. In addition to bacteremia, the scope of infections caused by NOVC increases day by day involving many organs of the body [4-6].

References

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Table 1. The results of biochemical tests in API 20E and API 20NE

Biochemical tests performed	Result	Biochemical tests performed	Result
VP test	Negative	Arabinose fermentation	Negative
Citrate Assimilation	Positive	Amygdalin fermentation	Negative
Gluconate Assimilation	Positive	Melibiose fermentation	Negative
Reduction of nitrate to nitrite	Positive	Saccharose fermentation	Positive
Indole production	Positive	Rhamnose fermentation	Negative
Glucose fermentation	Negative	Sorbitol fermentation	Negative
Arginine hydrolysis	Negative	Inositol fermentation	Negative
Urease production	Negative	Mannitol fermentation	Positive
Esculin hydrolysis	Negative	Citrate Utilization	Negative
Gelatin hydrolysis	Positive	Tryptophan deaminase	Negative
β-galactosidase production	Positive	H_2S production	Negative
Glucose assimilation	Positive	ONPG	Positive
Arabinose assimilation	Negative	Ornithine decarboxylase	Negative
Mannose assimilation	Negative	Lysine decarboxylase	Negative
Mannitol assimilation	Positive	Sucrose fermentation	Positive
N-acetyl glucosamine assimilation	Positive	Phenyl acetic acid assimilation	Negative
Maltose assimilation	Positive	Malate assimilation	Positive
Capric acid assimilation	Negative	Adipic acid assimilation	Negative