

Multiple Drug-Resistant *Vibrio Cholerae* Responsible for Cholera Outbreak among Migrant Domestic Workers in Kerala, South India(1)

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Background : Cholera, an acute diarrhoeal disease caused by the water – borne bacteria *Vibrio cholerae*, infects population exposed to poor water, sanitation and hygiene (WASH) facilities. According to the infectious disease surveillance programme (IDSP), 13 states of India are endemic to cholera.

Objective: This study deals with the epidemiological investigations of cholera outbreak among migrant workers as well as the antibiotic resistance profile of *Vibrio cholerae* isolates.

Methods: The water samples (25 mL) were collected from the river and ground water source in Pathanamthitta and Kozhikode, Kerala. Serotyping of the clinical isolates of *Vibrio cholerae* were determined by agglutination tests with polyvalent O1 antiserum, monovalent serotypes of Inaba, Ogawa and antiserum of O 139. The clinical isolates were screened for their antimicrobial susceptibility using the Kirby-Bauer disk diffusion method on Mueller-Hinton Agar against **15 antimicrobial drugs** as follows: **ampicillin** (25 µg), **tetracycline** (30 µg), **erythromycin** (15 µg), **gentamicin** (30 µg), **trimethoprim** (30 µg), **cefalexin** (30 µg), **cefepime** (30 µg), **cefoxitin** (30 µg), **ceftriaxone** (30 µg), **chloramphenicol** (30 µg), **gatifloxacin** (5 µg), **imipenem** (10 µg), **moxifloxacin** (5 µg), **nalidixic acid** (30 µg) and **norfloxacin** (10 µg). **The isolates were classified into resistant or sensitive based on zone of inhibition.**

ACADEMIC P.E.A.R.L.S

Pediatric Evidence And Research Learning Snippet



***Vibrio Cholerae* Outbreaks : Still a recurring problem!!!**

Results: Analysis showed that all the four clinical strains of *Vibrio cholerae* isolated from Kozhikode and Pathanamthitta were pathogenic harbouring *toxR* and *ctxA* genes and serological analysis grouped them as O1, Ogawa. Alarmingly, all the isolates were resistant to cell wall synthesis inhibiting antibiotics tested belonging to penicillins (ampicillin) as well as first to fourth generations of cephalosporins (cephalexin, cefoxitin, ceftriaxone and cefepime) and carbapenem (imipenem). **All isolates were susceptible to tetracycline.**

Key message: Virulence genes of *Vibrio cholerae*, *toxR* and *ctxA*, were detected in the river and ground water samples collected from the outbreaks sites which indicates need of enhanced awareness on WASH practices among residents. Isolates were resistant to multiple antibiotics including carbapenems like imipenem, however, **they were susceptible to tetracycline.**

Similar evidence: Pal et al. (2) in their study reported variants of the *ctxB* allele of *Vibrio cholerae* O1 isolated between 1995 and 2019 in Odisha, India. The *ctxB1* genotypes dominated from 1995 to 2016. The *ctxB7* genotype spread was noted from 2007 to 2019.

EXPERT COMMENT

“Though Cholera does not figure as the most common cause of profuse watery diarrhoea in children in recent times, seasonal outbreaks do occur in areas with poor supply of potable water and unclean sanitation (WASH) practices. A high index of suspicion, culture of stool specimen or rectal swab in the selective thiosulfate–citrate–bile salts agar (TCBS) helps clinch diagnosis. Adequate rehydration is the main stay of treatment and timely isolation of the antimicrobial susceptibility is necessary to improve outcomes.”

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With warm regards,

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Reference

1. Krishna K, Anas A, Kuttan SP, Vijayakumar S, Chekidhenkuzhiyil J, Philomina B, Kurien S. Multiple drug-resistant *Vibrio cholerae* responsible for cholera outbreak among migrant domestic workers in Kerala, South India. In Multidisciplinary Digital Publishing Institute Proceedings 2021 ;Vol. 66, No. 1, p. 26.
2. Pal B, Nayak A, Nayak N. Emergence and spread of different *ctxB* alleles of *Vibrio cholerae* O1 in Odisha, India. International Journal of Infectious Diseases 105 ;2021; 730–732.