

***Vibrio cholerae* O139 in Thailand in 1994**

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SUMMARY

Vibrio cholerae O139 first appeared in India and Bangladesh in 1992. Surveillance for O139 was started at three hospitals in Thailand in 1993. By 1994 all three hospitals surveyed in Thailand had experienced an increase in *Vibrio cholerae* O139 infections.

INTRODUCTION

In 1992, epidemics of a cholera-like illness caused by *Vibrio cholerae* O139 occurred in India [1] and Bangladesh [2]. This strain was antigenically unique and had pandemic potential. By early 1993, this strain was isolated from patients with diarrhoea in Thailand [3]. Surveillance for *Vibrio cholerae* O139 was started at three hospitals in Thailand in the summer of 1993.

MATERIALS AND METHODS

Three different hospitals in Thailand that were surveyed included: Samutsakorn hospital, a provincial hospital 30 kilometres to the west of Bangkok; Children's Hospital in Bangkok; and Suan Phung hospital, a small district hospital on the Thai–Burmese border. All patients with watery diarrhoea, either in-patients or out-patients, that were seen Monday through Friday, were cultured for *Vibrio cholerae*.

Stools or rectal swabs collected from patients with diarrhoea were cultured on thiosulfate-citrate-bile-salts sucrose agar (Eiken Ltd, Tokyo, Japan) before and after inoculation in alkaline peptone water, pH 8.0. Isolates were identified as *V. cholerae* using criteria described by Sakazaki [4]. *V. cholerae* isolates were tested for agglutination in polyvalent O1 and monospecific Ogawa, Inaba, and O139 antisera. *V. cholerae* isolates were tested for DNA sequences encoding cholera toxin (ctx) [5]. Colony hybridization assays were performed on Whatman 541 filters as described by Maas [6].

Pre-hybridization and hybridization reactions were performed under stringent hybridization conditions in 50% formamide, 2× Denhardt's solution

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Table 1. Number of cases of *V. cholerae* O1 and O139 seen at three hospitals in Thailand, 1993-4*

	No. patient cultured	O1	O139
Samutsakorn hospital			
11 Nov-31 Dec 93	363	23 (6%)	9 (2%)
1 Jan-10 Mar 94	903	101 (11%)	84 (9%)
Children's Hospital			
1 Aug-31 Dec 93	2,238	30 (1%)	3 (< 1%)
1 Jan-10 Mar 94	1,004	29 (3%)	24 (2%)
Suan Phung hospital			
1 Oct-31 Dec 93	134	1 (< 1%)	1 (< 1%)
1 Jan-10 Mar 94	185	1 (< 1%)	4 (2%)

* Samutsakorn hospital surveillance started in 11 November 1993; Children's Hospital surveillance in 1 August 1993; and Suan Phung hospital surveillance in 1 October 1993.

1994 - hospital surveillance as of 10 March 1994.

(1 × Denhardt's solution, 0.02% Ficoll 400, and 0.02% polyvinylpyrrolidone), 4 × SET (1 × SET, 150 mM-NaCl 30 mM-Tris pH 8.0, and 1 mM EDTA), 0.4% SDS, 6% polyethylene glycol-8000, 500 µg/ml heparin and 100 µg/ml of calf thymus DNA (Sigma Chemical Co, St Louis, MO) [7]. Uncooked seafood collected in markets in Samutsakorn and water stored in clay jars used for washing after defaecation were cultured for *Vibrio cholerae* using the millipore filter technique [8].

RESULTS

In 1993, < 1% of patients with diarrhoea cultured at Children's Hospital, and Suan Phung hospital were infected with *V. cholerae* O139. Between 1 January and 10 March 1994, the number of patients infected with *V. cholerae* O139 increased dramatically. Eighty-four patients with diarrhoea infected with *V. cholerae* O139 were identified at Samutsakorn hospital, 24 at Children's Hospital, and 4 at Suan Phung hospital (Table 1). Most infections occurred in adults or older children.

Although *V. parahaemolyticus* and *V. cholerae* non-O1 were isolated from > 50% of 500 uncooked seafoods collected in markets in Samutsakorn in February and March 1994, surprisingly no *V. cholerae* O1 or O139 were isolated from uncooked seafood. *V. cholerae* O139 was isolated from water in 4 of 7 Ongs (bathing water containers) in homes of patients infected with *V. cholerae* O139. All of the 125 *V. cholerae* O139 and 185 of the *V. cholerae* O1 isolates hybridized with the ctx probe.

DISCUSSION

The rapid emergence of *V. cholerae* O139 in Thailand is similar to the rapid spread of this organism within India [9]. Little is known about the mode of transmission of this organism which appears to have pandemic potential. *V. cholerae* O139 infections have been reported in Bangladesh, Nepal, Malaysia, and Pakistan [9]. Imported cholera associated with *V. cholerae* O139 has been reported in California [10], England and Wales [11], and Switzerland [12].

A prospective case-control study is being conducted in Samutsakorn to compare risk factors for becoming infected with *V. cholerae* O1 and O139. In contrast to the

experience in India [9] where O139 replaced O1 isolates both *V. cholerae* O types occurred in the same proportion of patients in Thailand at the same time. The isolation of *V. cholerae* O139 that hybridized with the ctx probe from bathing water suggests water may be important in the dissemination of the organism in the environment.

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