

An appraisal of El Tor carrier state in Kelantan

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Introduction

SINCE THE CHOLERA OUTBREAK in which 50 confirmed El Tor cases and 20 contacts were recorded in Kelantan in 1964, not a single case of cholera occurred until 1969 when another outbreak was recognised during the period between April and August 1969, involving 80 confirmed El Tor cases and 55 contacts. From September, 1969 to November, 1970, there was no incidence of cholera in Kelantan.

A series of El Tor cholera outbreaks occurring in various parts of Malaysia from 1963 to 1970 are reported to be predominantly water-borne (Felsenfeld, 1967; Government of Malaysia, 1963; Leng, 1963 and Paul, 1970). We also observed that water played a predominant role in the transmission of El Tor infection during the outbreak in Kelantan in 1969. It is postulated by some school that outbreak and subsequent spread of cholera are caused by long-term carrier (Khan, 1967 and Wallac et al, 1967), but recently Tamyo et al (1966), Dizon (1965), Mackenzie (1965) and Chuttani et al (1967) have reported short duration of carrier state in their systemic studies in which not a single clinical case could be traced to have occurred due to a carrier. This report supports the current views of the latter school.

Materials and Methods

A total of 17,220 specimens of stool, water and shellfish were examined for *V. cholerae*. Each sample was first cultured in peptone water (pH 9.4) for six hours and then subcultured in cholera medium (Oxoid) for 24 hours. One litre of each water sample was filtered through milipore filter before culture. Bacterial colonies were examined morphologically and confirmed by serological test using Burrows Wellcome sera. Polymyxin sensitivity and chicken red cell agglutination tests were carried out to identify the biotypes of *V. cholerae*. Stool of confirmed cases of cholera and contacts of both 1964 and 1969 epidemics were repeatedly cultured at variable intervals in order to assess the carrier state in the household and community.

Results

Stool of 55 suspected cases and contacts, 35 samples of water of wells and rivers, and 50 specimens of edible river shellfish collected during 1969 epidemic were found to be vibrio-positive (Table-1). Considerable number of cases and contacts appeared to be infected through drinking polluted water of wells and rivers; the latter seem to be contaminated through

Table-1

Distribution of El Tor and Non-agglutinable vibrios
in 17220 specimens

Nature of specimen	Vibrio-positive	Vibrio-negative	Total
Stool of suspected cases (1969 outbreak)	80	4170	4250
Stool of contact (1969 outbreak)	55	7195	7250
Water of well/river	35	465	500
Shellfish	50	100	150
Stool of healthy person	0	5000	5000
Stool of confirmed cases/contacts (1964 outbreak)	0	70	70
Total	220	17000	17220

Table-2

Rate of incidence of carrier

Nature of specimen	Number of specimen	Short-term carrier	Long-term carrier
Stool of confirmed cases and contacts	205	10	0
Stool of healthy person	5000	0	0
Total	5205	10	0

overhung latrines. An appreciable number of cases and contacts seem to be infected also through eating raw or partially-cooked shellfish containing El Tor vibrio. From 1965 to 1968, not a single case of cholera was seen in Kelantan. In the epidemic period between April and August 1969, ten short-term asymptomatic carriers were found; they excreted vibrios in their stool up to eight days. In the post-epidemic period between September, 1969 and November, 1970, neither a single case of cholera nor a carrier was demonstrated among 5,500 random cases of acute gastroenteritis and healthy persons (Table 2).

Discussion

Most of the confirmed cases and contacts of cholera of both 1964 and 1969 epidemics were seen in villages dotted along the banks of the tributaries of the Kelantan River near its mouth into the sea. They seemed to contract infection through drinking water from polluted wells and rivers which appeared to be contaminated from overhung latrines. Limited outbreaks of cholera have been found to be water-borne (Barua, Personal Communication). Water-borne epidemics are usually explosive in nature involving a large number of persons at a time drinking the water (Mukherjee, Personal Communication). A change from explosive water-borne to slower principally carrier-borne propagation has been reported by Tamyo et al (1966). Paul (1970), in his epidemiological survey of the 1964 cholera outbreak in Kedah, observed an initially minor carrier-borne followed by a major water-borne transmission of infection.

In this series, we observed few asymptomatic short-term carriers who excreted vibrios in their stool up to eight days. Chuttani et al (1967) found 6.7% asymptomatic household carrier and 4.2% community carrier in 1,186 specimens of stool of contacts of 163 confirmed cases of cholera; they were all short-term carriers who excreted vibrios in their stool up to seven days and all of them belonged to households with shallow tube well water supplies which were seen to be heavily contaminated by El Tor vibrio. They believed that the possibility of a spread of infection through short-term carriers seemed to be remote in the majority of households and communities because in their series 80.4% of the families had no carriers and there was only a single cholera case in 91% of the households. Secondly, in most of the cases, the drinking water was highly polluted and could equally be a possible source of infection.

Our observations in regard to the role of carrier and water in the transmission of El Tor infection

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were closely similar to those of Chuttani et al (1967). It is clear on the basis of the study of this large series, from 1964 to 1970, that a long-term carrier most probably does not occur in Kelantan. If a carrier state would persist for a long time, it is reasonable to expect occurrence of sporadic cases or outbreaks of cholera in almost every year during the period between 1964 and 1970 when ecological and environmental conditions have apparently remained constant in Kelantan.

Summary

A total of 17,220 specimens were bacteriologically examined in July, 1969 to November, 1970. Ten short-term carriers, but not a single long-term carrier, were found. Their role in the transmission of El Tor infection in both the 1964 and 1969 epidemics of Kelantan is considered to be insignificant. In Malaysia, water-borne, rather than carrier-borne outbreaks of El Tor cholera seem to occur frequently. Water and edible river shellfish are regarded as the main vehicles in the spread of the 1969 cholera outbreak in Kelantan.

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