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Incidence of Cholera in Children under two years of age at the Dr. Soetomo Hospital, Surabaya

by

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Abstract

Stool cultures from 510 patients, admitted to the Children's Ward of the Dr. Soetomo Hospital with gastroenteritis, were examined.

Fifty-six cases were found to have para Cholera El Tor (10.98%) and 56 patients showed positive *E. coli* (10.98%). The clinical features of para Cholera El Tor have been discussed, and compared with *E. coli* infections. We also reviewed the clinical observations of other writers. Clinically Cholera El Tor and *E. coli* have similar signs and symptoms. They differ only in: (a) Age (El Tor is usually found in older age groups), (b) Nutritional State (El Tor is found among the undernourished), (c) State of dehydration (El Tor causes dehydration more rapidly), and (d) Faeces (El Tor excretes more faeces per movement).

Introduction

To make a diagnosis of cholera in a baby is very difficult indeed, because it is often thought to be an ordinary gastroenteritis, due to lack of classical signs and symptoms as in adults.

Following the first article about para Cholera El Tor outside Sulawesi in adults by Gan Koen Han (1958), many other articles have been published i.e. from Semarang, Liem and Liem (1961) wrote about Cholera in children aged 14 month — 12 years; from Jakarta, Widodo Talogo et al. (1964) reported its incidence in children with an average age of 6 years. Erwin et al. (1965) from Bandung, Manerong et al. (1965) from Jakarta, Dewanoto (1968) from Bandung mentioned briefly about the incidence of para Cholera El Tor in babies aged between 0 — 2 years.

We believe that there is no description yet of the clinical features of para Cholera El Tor especially in babies of 0 — 2 years. Clinically para Cholera El Tor is very hard to differentiate from gastroenteritis caused by other organisms as it can cause mild to severe dehydration (Erwin et al., 1965); Gan Koen Han, 1965; Maneroeng et al., 1965).

The pathogenesis of diarrhoea in Cholera has a great deal of similarity with *E. coli* infections (Pierce, 1971). The high incidence of para Cholera El Tor in babies and the similarity of

its pathogenesis with *E. coli*, lead us to study further and recognize the signs and symptoms of para Cholera El Tor, especially in children under 2 years of age.

Material and method

Patients included in the study were dehydrated children with gastroenteritis, who were admitted to the Children's Ward of the Dr. Soetomo Hospital. Four rectal swabs were taken from each patient, and cultured immediately into the medium provided by the local Government's laboratory. We selected only patients with Cholera and Enteropathogenic *E. coli* for study.

We recorded the type of food they had consumed, when they started to vomit, when the diarrhoea commenced and its frequency, the nutritional state of the patients, the degree of dehydration, complications, associated diseases and the death rate.

Routine laboratory tests included faeces, blood urine examination, smear and culture.

Results

From 510 patients with gastroenteritis we found 56 patients with El Tor (10.98%) and 56 patients with *E. coli* positive cultures (10.98%). There was no sex difference in the incidence of either infection (Table 1).

Excluding deaths from associated diseases, both infections had similar mortality rates (8 deaths from 56 patients).

TABLE 1 : *Number of children with Cholera/E. coli infection by sex and mortality.*

	♀	♂	Total		Mortality
Cholera	20	36	56	11	8 without complications 3 with complications
E. coli	21	35	56	9	8 without complications 1 with complications
	41	71	112	20	

TABLE 2 : *Age distribution of children with Cholera/E. coli infection.*

	0 - 6 months	7 - 12 months	13 - 24 months
Cholera	4	24	28
E. coli	29	16	11

Chi² = 16.150
p < 0.01

TABLE 3 : *Nutritional state.*

	AO - AI Normal	BII Slightly U.W.	BIII - CIV Moderately- severely U.W.
Cholera *)	6	11	35
E. coli	22	16	13

Chi² = 16.150

p < 0.01

* The body weight of 1 cholera patient was not noted

TABLE 4 : *Duration of "home treatment"*

	≤ 1 day	2 - 3 days	≥ 4 days
Cholera	39	10	4
E. coli	27	15	7

* 2 patients were not noted

Chi² = 3.4841

p > 0.10

TABLE 5 : *Frequency of diarrhoea.*

	1 - 3 x	4 - 5 x	6 x
Cholera	4	17	32
E. coli	6	10	35

Chi² = 2.3109

p > 0.10

TABLE 6 : *Degree of dehydration on arrival*

	Moderate	Severe
Cholera	8	45
E. coli	23	28

Chi² = 16.150
p < 0.01

TABLE 7 : *Incidence and frequency of vomiting*

	1 - 3 x	4 - 5 x	6 x
Cholera	15	11	13
E. coli	18	8	6

Chi² = 1.4131
p > 0.10

	Vomiting (+)	Vomiting (—)
Cholera	39	14
E. coli	32	19

TABLE 8 : *Time of occurrence of vomiting.*

	After diarrhoea	Before diarrhoea	
Cholera	26	5	8
E. coli	22	6	4

TABLE 9 : *Kind of feeding (breastfed/non-breastfed) during the period of diarrhoea.*

	Breastfed (+)	Breastfed (-)	
Cholera	23	30	53
E. Coli	29	22	51

Chi² = 1.8853
p > 0.10

TABLE 10 : *Degree of temperature*

	< 37.5* C	> 37.6* C
Cholera	20	25
E. coli	14	29

Chi² = 0.13108
p > 0.10

TABLE 11 : *Smell of the stool*

	Foul Smell	Odorless	Total
Cholera	3	38	41
E. coli	5	20	25

Chi² = 1.2064
p > 0.1

TABLE 12: *Appearance of the stool*

	Rice water	Water	Total
Cholera	—	41	41
E. coli	2	23	25

Discussion

Para Cholera El Tor may attack children at any age. The youngest child with Cholera reported by Liem and Liem (1961) was 15 months old, however Erwin et al. (1965), Jo Kian Tjay and Talogo (1965) reported even younger cases (four and five day-old-infants respectively). The youngest patient in our series was 20 days old. Yo Kian Tjay and Talogo (1965) found 3 cases of El Tor out of 50 cases of gastroenteritis, while Manoeroeng et al. (1965) found 1 case out of 169 cases of gastroenteritis. Dewanoto et al. (1968) reported two cases of El Tor out of 6 cases of gastroenteritis in children under 1 year of age.

We found half of our patients (28) under one year old. Whether or not this indicates an increasing incidence of El Tor in the age group of under 1 year, requires further study. We feel that para Cholera El Tor was found mainly amongst the undernourished children. The report of Erwin et al. (1965) supports this finding.

Breast feeding was found to have no influence on the incidence of both diseases. However, there is some uncertainty about this result. Liem Tjay Tie (1965) described differences in the quality of breast milk of mothers from different socio-economic backgrounds. The mothers from a low socio-economic background pro-

duce milk of lower quality. The lack of protein in the mother's diet does not cause a change in the total protein, but in the quality of the milk. Clinically para Cholera El Tor in children can give rise to mild or severe dehydration (Erwin et al., 1965; Jo Kian Tjay and Talogo, 1965), however in most cases at the Hospital it presents itself with severe dehydration (Erwin et al., 1965; Manoeroeng et al., 1965; Widodo and Zoeraida, 1965). Compared with gastroenteritis due to *E. coli*, para Cholera El Tor causes usually severe dehydration and rarely moderate dehydration. Home treatment for both types of gastroenteritis was not longer than 24 hours. There was no difference between them.

Several authors have found that para Cholera El Tor has a very sudden onset (Manoeroeng et al., 1965: average 11 hours; Widodo and Zoeraida, 1965: ½ day; Liem and Liem 1961: 2 to 12 hours). The frequency of diarrhoea per day was about 6 times (although quite often parents said "countless" or "came out as urine"). There was no difference in the frequency of diarrhoea between *E. coli* and El Tor infections.

From these results, the question arises as to why more patients with El Tor suffered from severe dehydration as compared with the *E. coli*, despite the fact that the frequency of diarrhoea and the duration of

home treatment were similar in both groups of patients. One possible answer is that in para Cholera El Tor the amount of faeces excreted per movement is greater than in gastroenteritis caused by *E. coli*. This was what we found with our patients. Similar findings have been reported by others (Liem and Liem, 1961; Liem Tjay Tie, 1965).

Most of our patients with El Tor vomited, but this also occurred in patients with *E. coli*; there was no difference between the two groups. Mostly they vomited following the diarrhoea, however, in a few cases it occurred before or together with the diarrhoea. This has been similarly reported by Liem and Liem (1965), on the other hand Widodo and Zoeraida (1965) had slightly different results. There have been different reports on the body temperature in children with Cholera El Tor; Erwin et al. (1965) reported that 31 out of 60 patients (51.7%) showed no in-

crease in temperature, however, Widodo and Zoeraida (1965) found that 40% of their patients had a temperature of less than 37° C. Our patients (44.4%) showed a temperature of 37.5°C. There was no significant difference in the body temperature between Cholera EL Tor and *E. coli* patients ($p > 0.10$).

In areas where El Tor strikes for the first time, men are more frequently infected than women. This may be the result of greater activity and morbidity leading them to be more easily contaminated. However, progressively the disease is transmitted to all age and sex groups, including children and in endemic areas babies are no exception.

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