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## Cholera El Tor Enteritis in Jakarta \*

by

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### Introduction

Gastrointestinal disturbances with symptoms of vomiting and diarrhoea, accompanied with acute dehydration, acidosis, sodium and potassium losses broke out in 1920 in Asia. This disease was called cholera Asiatica or classical cholera and was caused by "classical" cholera vibrios (Felsenfeld, 1966). It was also known in Europe. From 1923 to 1960 it subsided, but within this period a new type of cholera, cholera El Tor had made it appearance in Indonesia. In the Southern part of the island of Sulawesi, Indonesia, cholera El Tor was detected for the first time by de Moor (Felsenfeld, 1966; Moor, 1963; Mukerjee and Basu, 1967). Cholera El Tor is an endemic disease, which sometimes has its epidemic outbreaks. Sulawesi was considered endemic and the following epidemics occurred in 1939, 1944, 1957 and 1960

(Moor, 1963). Till 1960 cholera El Tor remained limited to Sulawesi and it attracted little attention from the rest of the world. Sulawesi was assumed to be the focus of pandemic cholera El Tor, when from this place it spread to other parts of the world (Felsenfeld, 1966; Moor, 1963; Mukerjee and Basu, 1967). Before the term "El Tor" was used, de Moor called this disease paracholera because its symptoms and signs resembled the classical cholera. In 1962 de Moor detected non-haemolytic vibrios during an outbreak of paracholera in West New Guinea, Indonesia. It was believed that classical cholera vibrios are haemodigestive, whereas El Tor strains are haemolytic. The cholera El Tor vibrios, which have been found during the present epidemic are non — haemolytic or became haemolytic only after several subcultures (Felsenfeld, 1966).

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Since 1961 cholera E Tor has been sweeping through the Far East and aroused the attention of the W.H.O. Cholera El Tor is classified as a quarantine disease. A conclusion is drawn that epidemiologically, clinically and pathologically cholera El Tor can not be differentiated from the classical cholera (Moor, 1965). The differences lie in the biochemical and physical characteristics (Felsenfeld, 1967).

Both vibrios belong to the same group, base on its O — antigen. Serologic subtypes are: Ogawa (AB), Inaba (AC) and Hikojima (AB/C). Water has an important role as an epidemiologic factor. The vibrios are found in rivers or wells as well as in the stools of the inhabitants living in the endemic or epidemic areas of the disease. Both water and carriers are dangerous factors in spreading the cholera (Felsenfeld, 1966). In 1970 Gharagozloo reported that normal flora of the gut act as filter against cholera vibrios in carriers. This is of no use if diarrhoea occurs or laxatives are supplied as these organisms would be excreted in the stool. The incubation period varies from one to five days, sometimes ten days. It has a sudden onset in the form of diarrhoea and abdominal pain. It can be preceded by vomiting. Rice water stool is characteristic. Unless secondary infections, haemorrhoids or fisteling are present, tenesmus is absent. Acidosis occurs in

severe cases. Washerwomen's hands are sometimes seen. Muscle spasm and signs of meningeal irritations are frequently found in children. The body temperature falls (algic cholera) and shock appears. Sometimes oliguria or anuria is present.

#### Material and methods

Our material consisted of infants and children with gastroenteritis, who were admitted to the Department of Child Health, Sumber Waras Hospital, Jakarta from April till August 1970. There were 328 infants and children, 199 (60,7%) were boys and 129 (39,3%) girls. Their age were varying between 3 days and 12 years. Laboratory studies were done for blood, urine and stool on the first day of hospitalization. From each patient, two rectal (sterile) swabs were taken. One was put directly into a sterile tube containig alkaline — peptone solution for the culture of cholera El Tor vibrios, and the other in broth medium for the culture of enteropathogens: Enteropathogenic E. coli, Shigellae and Salmonellae. These specimens were sent to the Department of Microbiology of the same hospital for further investigations. In case any microorganism grew on these cultures, a sensitivity test is performed.

Depending on the severity of the condition of the patient on admittance, an adequate quantity of fluid was administered either by mouth, with gastric tube or by intravenous

route. In case of shock, severe dehydration or electrolyte imbalance, the intravenous route was preferred. Ringer's with or without lactate solution were used and dextrose 5% in water was added to supply the minimum calory requirement. The amount of fluid given intravenously was maintained between 100 ml to 200 ml per kilogram body weight per day. This amount can be increased to a quantity comparable to the fluid loss by vomiting and diarrhoea. If the dehydration has been overcome, but the shock persists, vasopressor agents and corticosteroids are added. Blood or plasma was given in a quantity of 10 ml to 20 ml per kilogram body weight per day if necessary. Fluid by mouth was encouraged as soon as the patient's condition permitted. This was followed by feeding as soon as possible. Tetracyclin orally was given with a dosage of 30 mg per kilogram body weight per day divided in 3 equal portions. The drug was discontinued after the seventh day of hospitalization. In case the diarrhoea persisted after discontinuation of tetracyclin, other antibiotics were administered in agreement with the results of the sensitivity test. Other accompanying disease when present during hospitalization, was treated.

### Results

Out of the 328 infants and children in this study, 243 stool cultures were taken for cholera El Tor vibrios and

49 (20,2%) revealed positive. Four results of stool cultures for enteropathogens could not be found and only 239 could be collected. Out of the 239 stool cultures 15 (6,3%) were positive for Enteropathogenic *E. coli*, 7 (2,9%) for Shigellae and 1 (0,4%) for Salmonellae (Table 2). Parasitic infestations showed that *Ascaris* ova were the most (55 cases), whereas *Trichuris* 15 cases and Hookworm in 4 children (Table 5). Respiratory tract infections, followed by malnutrition were the main diseases frequently found in our study. In the cholera El Tor patients, the complaints and symptoms were observed 8 hours (average) before admittance. Diarrhoea was present in all cases with cholera El Tor, vomiting occurred in 80,2%, shock in 67,3%, acidosis in 24,3%, poor turgor of the skin in 89,8% and elevated body temperature in 69,4% (Table 6).

The total mortality of diarrhoeal disorders was 14,7% (48 out of 328 caese), 22 of them died during the first 24 hours of hospitalization. The mortality of cholera El Tor cases was 12,2% (6 out of 49 cases), one child died during the first 24 hours of hospitalization. No mortality was found among the children with positive stool cultures for Salmonellae and Enteropathogenic *E. coli*. Out of the 7 cases with positive stool cultures for Shigellae, one child died during the first 24 hours of hospitalization (14,3%) (Table 3). On the

TABLE 1 : Sex distribution and stool cultures

Sex	No. of patients	Vibrio El Tor	Enteropathogens
Male	199(60,7%)	144(59,2%)	153(64,0%)
Female	129(39,3%)	99(40,8%)	86(36,0%)
Total	328	243	239

TABLE 2 : Stool cultures

	Vibrio El Tor	E.E. coli	Shigellae	Salmonellae
Total cultures	243	239	239	239
Positive cult.	49(20,2%)	15(6,3%)	7(2,9%)	1(0,4%)
Male	29	11	5	1
Female	20	4	2	0

TABLE 3 : Mortality rates

	No of patients	Vibrio El Tor	E.E. coli	Shigellae	Salmonellae
Total	328	49	15	7	1
Mortality	48 (14,7%)	6 (12,2%)	0 (0%)	1 (14,3%)	0 (0%)
The first 24 hours	22	1	0	1	0

eight day (in average), these patients were discharged from the hospital. Monthly admittances of cholera El Tor cases in this department are shown in Table 7.

#### Discussion

Prior reports of gastroenteritis showed that more boys were affected as compared to the girls (Manoe-roeng et al., 1970; Suratman et al., 1965; Soemarsono, 1970). There was no explanation concerning this phenomenon. In our opinion, boys are more apt to be infected than girls, due to the fact that the boys are more greedy. The negative results in our bacteriological examination and parasitic infestations of the stool may be due to other causes, such like: viral, protozoal and fungicidal infections, chemical and food poisoning, food intolerance, disturbances in the digestive system and non — enteropathogens (staphylococci, streptococci, proteus) infections. Parenteral infections come also into consideration. The present report shows that worms ova are found frequently in the stools on direct microscopic stool examination, especially *Ascaris* and *Trichuris*. This is common in Indonesia.

To correct the acidosis, both sodium bicarbonate and lactate solutions can be used. Although bicarbonate solution elevates the serum bicarbonate and pH of the blood more rapidly, lactate solution can be used effectively (Cash et al., 1969; Wat-

ten et al., 1969; Tjia Soe Kie, 1967). The use of acetate solution is suggested by Watten et al. (1969). This last kind of solution was reported that it is more stable in tropical countries as compared to the bicarbonate solution and cheaper to the lactate solution. Although correction of the dehydration, electrolyte imbalance and shock are the main and important measures in the treatment of cholera El Tor, antibiotics or chemotherapeutics given orally play a role in the excretion of the vibrios in the stool.

Gharagozloo et al. (1970) confirmed this fact by his study of cholera El Tor, where oral tetracyclin, chloramphenicol, tri-moxazole (Trimethoprim/Sulphamethoxazole) and placebo (dextrose tablet) are used. The result revealed that these antibiotics and chemotherapeutics are superior in bradycating the excretion of cholera vibrios in the stool. Lindenbaum et al. (1967) reported that clinically, tetracyclin and chloramphenicol reduce the frequency and volume of the stool in cholera El Tor. According to these reports, antibiotics or chemotherapeutics have influences in the spreading of the diseases. Gharagozloo et al. (1970) and Gangarosa et al. (1966) reported that laxatives ( $MgSO_4$ ), caused excretion of cholera vibrios. which formerly were negative. Normal flora of the intestines act as filter for cholera vibrios in carriers, but this filter became useless when la-

TABLE 4 : *Accompanying diseases*

Diseases	Total	Vibrio El Tor	E.E. coli	Shigellae	Salmonellae
Bronchitis	22	2	—	2	—
Br. pneumonia	43	1	1	—	—
Convulsions	22	—	1	1	—
Malnutrition	28	2	3	1	—
Pulm. tuberculosis	9	1	1	—	—
Acute otitis media	8	—	—	1	—
Chron. Supp. Otitis	10	2	—	—	—

TABLE 5 : *Parasitic infestations*

Parasites	No of cases	V. El Tor cases	E.E. coli cases	Shigellae cases	Salmonellae cases
Ascaris	55	8	1	1	—
Trichuris	15	5	—	—	—
Hookworm	4	1	—	—	—

TABLE 6 : *Symptoms and signs of the El Tor cases*

Complaints before admittance	:	8 hours (average)
Vomiting	:	80,2%
Diarrhoea	:	100 %
Elevated body temperature	:	69,4%
Shock	:	67,3%
Acidosis	:	24,3%
Poor turgor of the skin	:	89,8%

xatives are applied or in existence of diarrhoea and also when these normal flora are suppressed by excessive use of antibiotics.

The mortality of cholera before the second world war was 70% to 80%, but decreased afterwards to 15% — 20% (Moor, 1963). Manoroeng et al. (1970) reported a mortality of 13,6% and Liem Hok Nio and Liem Tjay Tie (1961) 28,5%. The mortality of cholera El Tor in our study was 12,2%, one patient died during the first 24 hours of hospitalization. The decrease in the mortality was obviously due to improvements of the intravenous fluid treatment and the use of more potent antibiotics which have advantages in abolishing the parenteral infections, which usually accompany the present illness. The mortality caused

by Shigellae was approximately similar (14,3%).

### Summary

During a five months' period, 328 infants and children with gastroenteritis were admitted to the Department of Child Health, Sumber Waras Hospital, Jakarta. Bacteriological examination of the stool revealed: 20,2% positive for cholera El Tor vibrios, 6,3% positive for Enteropathogenic E. coli, 2,9% for Shigellae and 0,4% for Salmonellae. Treatment consisted of fluid intravenously, containing electrolytes, lactate and dextrose 5% in water. Blood and plasma were added when necessary. Tetracyclin orally was given in the entire cases. The total mortality was 14,7% and the mortality of cholera El Tor was 12,2%.

### REFERENCES

1. BASU, S; BHATTACHARYA, B. and MUKERJEE ; Interaction of vibrio cholerae and vibrio El Tor. Bull. W.H.O. 34 : 371 (1966).
2. CASH, A.R.; NALIN, R.D.; TOHA, K.M.M.; HUGH, Z. and PHILLIPS, A.R. ; Acetate in the correction of acidosis secondary to diarrhoea. Lancet ii : 302 (1969).
3. FELSENFELD, O. ; Review of recent trends in cholera research and control: with an annex on the isolation and identification of cholera vibrios. Bull. W.H.O. 34 : 161 (1966).
4. GANGAROSA, E.J; SHAGHARI, H; EMILE, J. and SIADAT, H. : Detection of Vibrio Cholerae biotype El Tor by purging. Bull. W.H.O. 34 : 363 (1966).
5. GHARAGOZLOO, R.A.; NAFICY, K.; MUIN, M.; NASSIRZADAL, M.H. and YALDA, R. ; Comparative Trial of Tetracyclin, Chloramphenicol and Trimethoprim/Sulphamethoxazole in Eradication of vibrio cholerae El Tor. Brit. med. J. 4 : 281 (1970).
6. LIEM HOK NIO dan LIEM TJAY TIE : Penyakit El Tor pada kanak-kanak di RSUP Semarang. Madj. Kedok. Indon. 8 : 406 (1961).
7. LINDENBAUM, J.; GREENOUGH, B.W. and ISLAM, M.R. : Antibiotic therapy of cholera. Bull. W.H.O. 34 : 871 (1967).
8. MANOEROENG, S.M.; SUTAN ASSIN, M.; SOETEDJO and TE BEK SIANG : Paracholera El Tor in child-

- hood. Seminar Surveillance Epidemiologi penyakit menular, Jakarta, Maret 1970.
9. MOOR, C.E. : A Nonhaemolytic El Tor vibrio as the cause of an outbreak of paracholera in West New Guinea. *Trop. geogr. Med.* 15 : 97 (1963).
  10. MUKERJEE, S. and BASU, S. : Cholera El Tor in India : Effect on epidemiology of classical cholera. *Trop. geogr. Med.* 19 : 138 (1967).
  11. SURATMAN, E.; SARWONO, S. and SOEGIRI : A study of incidence of the El Tor disease in children in Bandung. *Paediat. Indon.* 5 : 1 (1965).
  12. SOEMARSONO : Klinik dan pengobatan penyakit El Tor. Seminar Surveillance Epidemiologi penyakit menular, Jakarta, Maret 1970.
  13. TJIA SOE KHIE : Penjelidikan vibrio El Tor yang diasingkan di Jakarta dan tjara baru untuk membedakan antara vibrio El Tor dan vibrio cholera; Tesis (Jakarta, 1967).
  14. WATTEN, R.H.; GUTMAN, R.A. and FRESH, J.W. : Comparison of Acetate, Bicarbonate in treating the acidosis of cholera. *Lancet* ii : 512 (1969).