

Clinical Observation of *Vibrio parahemolyticus* Infection in Thailand

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OBJECTIVE: To determine the clinical pattern of *V. parahemolyticus* gastroenteritis in Thai patients, and to evaluate the efficacy of common antimicrobial agents in the treatment of the disease.

BACKGROUND: Studies on *V. parahemolyticus* infection in Thailand were initiated by SEATO Medical Research Laboratory (SMRL) in 1970. The preliminary study indicated that *V. parahemolyticus* was a major cause of gastroenteritis in adults in Bangkok (1). At the Bumrasnaradura Infectious Disease Hospital, located in Nonthaburi, this organism was isolated from approximately 25% of the diarrheal patients. Throughout the year the marine environment, (sea water, fish, crabs, oysters) was found heavily contaminated with this halophilic bacillus; therefore, sea foods are implicated as the major source of the *V. parahemolyticus* diarrheal outbreaks in this community. The detailed clinical picture of this disease, its mode of transmission in Thailand, and the efficacy of antimicrobial therapy has not previously been described.

DESCRIPTION: All patients admitted to the Infectious Disease Hospital, Nonthaburi, with symptoms of acute gastroenteritis between September 1973 and August 1974 were included in the study. Rectal swabs for bacterial cultures were obtained daily for three consecutive days. Those patients with positive stool cultures for *V. parahemolyticus* were selected for the study.

A detailed history of the illness, and clinical findings were recorded. Blood cultures, leukocyte counts, urinalysis, and serum electrolyte determinations were made on the first day of admission, and subsequently as indicated.

Patients were randomly divided into one control group and two test groups. The control group received a placebo plus symptomatic and supportive therapy. One test group received co-trimoxazole (two adult tablets two times a day for five days) plus symptomatic and supportive therapy. The remaining group received oral tetracycline (40 mg/kg/day for five days) plus symptomatic and supportive therapy. Rectal swabs in each group were obtained and cultured daily for seven days or until cultures were negative for *V. parahemolyticus* for the three consecutive days.

RESULTS: Two hundred and twenty eight patients admitted to the hospital during the study period were found to harbor *V. parahemolyticus* in their diarrheal stools; of these patients 133 were available for clinical evaluation.

Forty three patients were treated with co-trimoxazole, 42 with tetracycline, and 48 were given placebos as a control. All patients were characterized in terms of age, sex, and duration of illness before therapy. These variables were comparable in all three study groups (Table 1).

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Table 1. Description of the 133 Patients Studied by Age, Sex and Duration of Illness

Characteristic	Placebo	Tetracycline	Co-trimoxazole
Age (Years)			
Less Than 20	8	7	10
20-40	28	22	20
40-60	9	10	10
More Than 60	3	3	3
Sex			
Male	30	30	27
Female	18	12	16
Duration of Illness before Therapy			
Less Than One Day	47	40	43
One-Two Days	1	2	-
Total Patients	48	42	43

Table 2. Clinical Findings of *V. parahemolyticus* Gastroenteritis in 133 Patients

Clinical Features	No. of Patients	%
Symptoms and Signs		
Abdominal Pain	132	99
Abdominal Distension	59	44
Abdominal Tenderness	6	5
Vomiting	118	89
Fever	59	44
Headache	43	32
Characteristics of the Stool		
Watery	102	76
Semisolid	30	22
Bloody	1	1
Mucus	1	1

The disease was characterized by acute, profound diarrhea with nausea and vomiting. The predominant symptom was colicky abdominal pain. Fever and headache were observed to a lesser degree. The stool was watery or semisolid without blood or mucus in the majority of cases (Table 2).

Antimicrobial Sensitivity: Sensitivity profiles are presented in (Table 3). Using the standardized single disc method of Bauer and Kirby (2), it was found that the majority of the isolates (78% to 100%) were sensitive to chloramphenicol, tetracycline, co-trimoxazole, neomycin, erythromycin and streptomycin. Only 6% and 62% of the vibrios tested were sensitive to ampicillin and colistin, respectively.

Response to Antimicrobial Agents: Antimicrobial therapy trials comparing oral tetracycline, co-trimoxazole and placebo were performed. There was no great difference in terms of clinical response (Table 4) or bacteriological response (Table 5) among the three groups studied. The majority of patients in each group had negative vibrio stool cultures after four days of therapy.

DISCUSSION: In this study only the severely ill patients requiring hospitalization are presented. The clinical syndrome which we observed in these patients may represent only the severe form of the infection. A complete clinical picture of the mild form of the disease needs to be described. Dehydration was not as severe as that seen in infection with *Vibrio cholera*. Intravenous fluid therapy was required only for the first few days of the illness. Localization of the infection in the lumen of the intestine is suspected due to the presence of diarrhea without bacteremia, leukocytosis or toxic symptoms (Table 6). Previous experiments on the pathogenicity of *V. parahemolyticus* using the infant rabbit model indicated that the organism elaborated toxic substances, presumably enterotoxins, into the intestinal fluid (1). Enterotoxins may play a major role in the pathogenesis of this disease.

REFERENCES:

1. Lecomboon, U., Duangmani, C., McMinn, M.T.: SEATO Medical Research Laboratory Annual Report, April 1972.
2. Bauer, A.W., Kirby, W.M., Sherris, J.C., and Turck, M.: Antibiotic Susceptibility Testing by a Standardized Single Method. *Am. J. Clin. Path.* 45:493, 1966.

Table 3. Sensitivities of 228 Strains of *V. parahemolyticus* to Eight Antimicrobial Agents

Antimicrobial Agents	Sensitive		Intermediate Sens.		Resistant	
	No. Strain	%	No. Strain	%	No. Strain	%
Co-trimoxazole	228	100	—	—	—	—
Tetracycline	197	86.4	31	13.6	—	—
Chloramphenicol	228	100	—	—	—	—
Ampicillin	2	0.9	12	5.3	214	93.8
Neomycin	98	43	128	56.1	2	0.9
Colistin	70	30.7	72	31.6	86	37.7
Streptomycin	36	15.8	141	61.8	51	22.4
Erythromycin	167	73.3	60	26.3	1	0.4

Table 4. Clinical Response to Antimicrobial Therapy in 133 Patients

Regimens	No. of Patients	No. Improved, Days after Treatment							
		1	2	3	4	5	6	7	Unknown*
Placebo	48	—	5	13	11	10	4	—	5
Tetracycline	42	1	9	10	14	2	—	2	4
Co-trimoxazole	43	1	5	15	12	7	1	—	2

*Unknown = Patients excluded from the study because of incomplete study schedule.

Table 5. Bacteriological Response to Antimicrobial Therapy in 133 Patients

Regimens	No. of Patients	No. with Positive Stool Culture, Days after Treatment						
		2	3	4	5	6	7	Unknown*
Placebo	48	7	20	14	6	—	—	1
Tetracycline	42	10	18	12	—	1	—	1
Co-trimoxazole	43	12	19	7	3	1	1	—

*Unknown = Patients excluded from the study because of incomplete study schedule.

Table 6. Laboratory Findings of *V. parahemolyticus* Gastroenteritis

Laboratory Findings	No. of Patients	%
<u>Total Leukocyte Count (per cu mm.)</u>		
Less Than 8,000	63	47.7
8,000-10,000	32	24.2
10,000-15,000	30	22.7
More Than 15,000	7	5.3
Total Number of Patients Tested	132	
<u>Serum Sodium (MEq/L)</u>		
Less Than 130	0	
130-150	83	79.8
More Than 150	21	20.2
Total Number of Patients Tested	104	
<u>Serum Potassium (MEq/L)</u>		
Less Than 3.5	12	11.5
3.5-5.5	88	84.6
More Than 5.5	4	3.8
Total Number of Patients Tested	104	
<u>Blood Culture (No growth)</u>	133	100.0