

## STUDY REPORTS

1. Title: Bacteriological Survey of Patients with Acute Diarrheal Diseases

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Objective To determine the types, frequency of occurrence, and patterns of antimicrobial sensitivities of enteric pathogens from stools of patients with acute or chronic diarrhea. Stools were studied in an effort to determine the incidence of other Enterobacteriaceae and their relationships to this disease.

Description This study included specimens from inpatients and outpatients, both sexes, from hospitals throughout Thailand. Most of the specimens were collected during the acute phase of the disease and came from patients hospitalized with diarrhea. During the first 9 months of this reporting period the laboratory procedure was as follows: In the Bangkok area either fecal specimens or three rectal swabs, moistened in alkaline peptone broth, were obtained from each patient. Two of the swabs were placed in enrichment broths (alkaline peptone, selenite-F) and the third streaked directly onto SS and MC agar plates. The alkaline peptone broth was subcultured to alkaline lauryl sulfate tellurite agar for isolation of vibrios. After overnight incubation at 37°C, the selenite-F broth was subcultured on SS and DC plates. Specimens from outside Bangkok were submitted in a holding medium, designed for the transport of enteric bacteria. Upon arrival at the laboratory, plates of SS and MC were streaked and tubes of selenite-F and alkaline peptone broth inoculated. The enrichment broths were subcultured as outlined above. All plates were examined after 24 and 48 hours incubation. Lactose-negative colonies were transferred to Kligler's iron agar slants and subsequently to a battery of media to determine patterns of biochemical activity. Those isolates showing biochemical patterns typical of Salmonellae, Shigellae, or vibrios were definitively identified in accordance with the serological methods described by Edwards and Ewing. During the last 3 months the procedure was modified by an additional subculturing of the Selenite-F broth to SS and MC after it had incubated an additional 24 hours at 37°C.

Progress Results of examinations of 4579 specimens from 2422 individuals are included in this report. Most of the 3866 specimens from Thai nationals were from patients in Children's Hospital, Bangkok, Thailand; other specimens were collected from patients at the Royal Thai Army, Royal Thai Navy, Siriraj, and Praputhabath Hospitals. Most of the 713 specimens from U.S. personnel were from the U.S. Embassy Medical Unit, SMRL and the 5th Field Hospital.

Isolations of enteropathogenic bacteria are summarized in Table 1. Approximately 7.1% of the specimens yielded Salmonellae; 4.1% yielded Shigellae and 8.8% yielded Enteropathogenic Escherichia coli (not shown in table). The predominance of Shigellae isolates from Americans and Salmonellae isolates from Thais are consistent with recovery rates found during the preceding five years. Most of the Salmonella isolates from Thais were S. paratyphi B from inpatients in the diarrheal ward at Children's Hospital. (Table 2) The possibility that some of these and frequently isolated enteropathogenic Escherichia coli (EEC) 025:B19:B23 represented hospital-acquired infections was investigated by comparing isolates from

inpatients and outpatients. The findings indicated that patients infected with S. paratyphi B were more likely to be hospitalized whereas those with shigellosis were not. Salmonellae, particularly S. paratyphi B, persisted in the stool much longer than Shigellae.

In an attempt to detect foci of S. paratyphi B in Children's Hospital, stool cultures or rectal swabs were obtained on 3 consecutive days from all diarrhea patients and 41 associated hospital personnel. Other cultures were carried out on items such as food, formulae, clinical charts, towels, etc. The only isolations of S. paratyphi B were from 2 of 15 diarrhea patients and there were no isolates of EEC 025:B19:B23. All diarrhea patients and 5 hospital personnel harboring other Salmonellae received a 3 day course of oral colymycin, an antibiotic to which all isolates were sensitive. Subsequent stool cultures from these individuals were negative, but the rate of S. paratyphi B isolations from hospitalized diarrhea patients during the following 5 weeks was slightly higher than the rate for the 5 weeks preceding the study. It was concluded that hospital transmission of S. paratyphi B was minimal and that this organism was relatively widespread in the local population.

The data in Table 3 show 13 species to be represented among the 188 shigellae isolates. Sh. flexneri was the predominating organism among the Thais; Sh. sonnei predominated among the Americans. Shigellae were isolated throughout the year and there were no specific outbreaks noted. Strain 025:B19:B23 was the predominant strain of EEC in those children checked for these organisms. The increase of vibrio isolates in recent months reflects sporadic cholera cases in the Bangkok area. These are discussed in the SEATO Medical Research Study on Cholera.

Summary Shigellae were the enteropathogens isolated most frequently from Americans while Salmonellae were isolated most frequently from Thais. There has been a substantial increase in the number of S. paratyphi B isolates. Studies indicated that this increase reflects an increase of paratyphoid fever in the Thai population because hospital-acquired cases were considered minimal.