

INTRODUCTION

Although the causative agents of diarrheal disease have been reported from many parts of the world, knowledge of the bacterial cause is still incomplete. The genus Salmonella is one of the important agents which causes gastrointestinal tract infection. The generic definition Salmonella was formulated by White (46) and then amended by the Salmonella subcommittee in 1934 and 1949. It is definitely known that many of Salmonellae are causative agents of enteric fever, about 1,000 serotypes have been included in this genus. The wide distribution of the microorganisms in environment with the poor education of people caused high mortality rate at the beginning of 18th century by Salmonellae. The improvement in environmental sanitation and a better knowledge of epidemiology of the disease led to dramatic reduction in morbidity. This has been followed by the advent antibiotic therapy.

In 1888, Chantemesse and Widal (9) isolated a bacterium from feces in five cases of acute dysentery. Cultures isolated by Chantemesse and Widal (9) were studied by Vailard and Dopter (44) who found it to be the same as that described by Shiga (36). Grigorieff (16) isolated cultures from eleven cases of dysentery in Russia, which he considered to be identical with the bacterium described by Chantemesse and Widal (9). The extensive epidemics of bacillary dysentery occurred in Japan and according to Shiga (36), 89,400 cases with 22,300 deaths were reported within one short period. The bacterium was reported to be Shiga's



microorganism and was selected subsequently as the type species of genus Shigella (8). The other reports followed that of Shiga such as Kruse (20), Strong and Musgrave (39), Gardner (14), Felsen (13), Wilson and Miles (47) and Madsen (24), and confirmed that the causative organisms of dysentery was the genus Shigella.

Escherichia coli strains predominate among the aerobic commensal organisms present in healthy human guts. The organisms are also incriminated as pathogens. They are found most frequently in pyogenic infections of the urinary tract as either pure cultures or mixed with faecal Streptococci. They also occur in appendix abscess, peritonitis, cholecystitis, septic wounds and bed-sores. The suspicion that Escherichia coli might also be capable of causing gastroenteritis particular in infancy has only been confirmed as a result of recent serologic evidence. Bray (4) first emphasised the pathogenic role of certain coli types in infantile gastroenteritis. The strain is now known as Escherichia coli O 111 and in common with other enteropathogenic types, it possesses a B types of K antigen.

The majority of reported epidemics of gastroenteritis have occurred among infants, however, it is not restricted to infants alone, the report of Mc Naught and Stevenson (25), show the enteritis in adult.

The organisms in Family Enterobacteriaceae which are the less common infections of gastrointestinal tract are Arizona and Proteus. Arizona cause the same disease as Salmonella.

Proteus mirabilis is the major strain isolated from pathogenic specimens and human feces. Besides Enterobacteria, the classical Vibrio cholerae are the virulent organisms which cause diarrhea. During the nineteenth century, pandemics of cholera broke out from Bengal, India. Outbreak occurred in recent years in Egypt (1947), Thailand (1958-1959) and Italy (1958). In 1961, Cholera due to the El Tor Vibrio, which had been confirmed to be endemic in foci in the Celebes began to spread to other parts of Indonesia. In the past few years epidemic of this Vibrio occurred in Hong Kong, Macao, the Philippines, Korea, South East Asia and Middle East. Clinically infection due to the El Tor Vibrio is indistinguishable from cholera due to Vibrio cholerae.

The drug therapy has been induced to combat the infections. In vitro sensitivity tests are still the best method used prior to the start of the treatment.

In Thailand, continuing studies on diarrheal diseases have been done for many years by the South East Asia Treaty Organization (SEATO) Medical Research Laboratories, and many other Institutes in Bangkok.

In the year 1966 they reported that approximately 18 percent of stool specimens from diarrheal patients were positive for known bacterial pathogens. In the Bangkok area the organisms most frequently isolated were Salmonella paratyphi B and Salmonella derby. In the north-eastern part of Thailand there was a series of outbreaks of acute diarrhea. The enteric pathogens most frequently isolated were enteropathogenic Escherichia coli and Shigella dysenteriae 1, the latter being

resistant to chloramphenicol, tetracycline, sulfathiazole and sulfadiazine but sensitive to colistin and kanamycin.

In the year 1968-1969, Shigellae were enteropathogens isolated most frequently from Americans in Thailand while Salmonellae were isolated most frequently from Thais. Most enteropathogens tested were sensitive in vitro to colistin follow in order of decreasing effectiveness by furazolidone, ampicillin, neomycin sulfate, chloramphenicol and oxytetracycline (33).

In the year 1970, Salmonella panama and Salmonella derby were the enteropathogens isolated most frequently from Thai children with acute diarrhea. Most enteropathogens tested were sensitive in vitro to colimycin and furazolidone and resistant to kanamycin, neomycin, oxytetracycline and chloramphenicol (29).

The objectives of this study were to determine the frequency of occurrence and distribution of enteropathogens in stools of patients with acute or chronic diarrhea and to determine the bacteriostatic levels of antimicrobial for these enteropathogens.

The present studies were directed at:

- i. Enteropathogen survey of stools from Diarrheal patients.
- ii. Monitoring of antimicrobial sensitivity patterns of diarrheal agents.

In Thailand, enteric disease represent one of the most important medical problems especially in children. The knowledge of the etiology

and therapy of enteric diseases is very important, because enteric bacilli are commonly resistant to several antimicrobial agents (30). Therapy of illness due to enteric bacilli is, therefore, often difficult. The development of resistance of these bacteria to antimicrobials occurs frequently, and current knowledge of effective antimicrobials is of continuing interest, especially to those medical facilities in the area lacking bacteriological laboratories.

The results from this study will provide data for selection of effective antimicrobials to combat diarrhea in civil populations.

For examples:

i. Base on the studies of Seato Medical Research Laboratory about in vitro sensitivity tests of enteropathogens to antimicrobials showed that the use of chloramphenicol or oxytetracycline is not indicated for therapy of most cases of bacterial diarrhea in Thailand and the finding that most isolates of both Salmonellae and Shigellae have remained sensitive in vitro to furazolidone and colistin justifies using them rather than broad spectrum antibiotics when antimicrobials are used arbitrarily to treat diarrheal diseases.

ii. Determination of the bacteriostatic levels of antimicrobials for enteric bacteria isolated from patients with acute diarrhea were made over the period 1963-1967 (30). Among those tested in 1963 oxytetracycline appeared to be the most effective antimicrobial against Salmonellae and Escherichia coli and was only slightly less effective

against Shigellae. In 1967 colimycin was the most effective against all three groups. In general the susceptibilities of these organisms were inversely proportional to the current usage and directly proportional to the costs of the antimicrobials on the local market.

So, indeed the current knowledge of effective antimicrobials is still a necessity for physicians and patients.