

A LABORATORY STUDY OF *SALMONELLA* *PARATYPHI-A* ISOLATED FROM AN OUTBREAK IN 1979

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SYNOPSIS

The first outbreak of paratyphoid-A was reported in Singapore, 1979, with a total of 67 bacteriologically confirmed cases. Majority of the strains isolated were untypable with the standard range of *S. paratyphi-A* phages, and were susceptible to the common antibiotics used in routine work. Clinically, the infection resembled typhoid and was mainly confined to the age-group between 15 and 35 year-old.

INTRODUCTION

Typhoid has always been a public health problem in Singapore. Paratyphoids are relatively rare and most of the sporadic cases reported in the past years were imported from other countries. Table 1 shows the incidence of paratyphoid-A cases confirmed bacteriologically. For the first time in Singapore, an unusually big number of cases was recorded in 1979. This paper presents a detailed study of the recent outbreak of paratyphoid-A infection.

TABLE 1
INCIDENCE OF PARATYPHOID-A IN SINGAPORE

Year	No. of cases	Phage-types:	1	2	3	4	5	6	Untypable
1975	7	N.D.							
1976	13	"							
1977	9	"							
1978	11		(3)	(2)	(2)	(2)	(2)		
1979	67		(2)	(3)	(1)	(4)	(8)	(2)	(47)

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METHODS AND MATERIALS

Patients' stools were inoculated on eosin methylene blue and MacConkey agar, and in enriched selenite broth. Blood or blood clots recovered from specimens requested for the Widal test were cultured in blood culture or ox-gall medium respectively. All cultures were incubated at 37 C overnight. The salmonellae isolated were serotyped and those identified as *S. paratyphi-A* were further phage-typed according to the method of Anderson and Williams (1956). Antibiotic susceptibility of the organisms was determined by Kirby-Bauer method (1966) against the following antibiotics prepared by Baltimore Biological Laboratory: chloramphenicol (30 mcg), ampicillin (10 mcg), septrin (sulfamethoxazole 23.75 mcg, trimethoprim 1.25 mcg), tetracycline (30 mcg), neomycin (30 mcg), triple-sulpha (250 mcg) and gentamicin (10 mcg).

**TABLE 2
MONTHLY DISTRIBUTION OF *S. PARATYPHI-A*
PHAGE TYPES IN 1979**

	Phage type						Untypable
	1	2	3	4	5	6	
January	(1)		(1)	(1)	(1)	(2)	
February	(1)	(1)					
March							
April					(1)		
May							
June					(2)		
July		(2)		(2)	(1)		(2)
August					(3)		(7)
September							(14)
October							(14)
November							(7)
December				(1)			(3)

**TABLE 3
AGE DISTRIBUTION OF PARATYPHOID-A IN 1979**

	No. of cases (collective phage-types)	No. of cases (untypable phage-type)
5 — 14	5	3
15 — 24	29	25
25 — 34	23	16
35 — 44	7	2
45 — 54	1	0
55 — 64	2	1
Total =	(67)	(47)

**TABLE 4
BIOCHEMICAL CHARACTERISTICS OF THE
S. PARATYPHI-A ISOLATED IN 1979**

Hydrogen sulphide production	Negative	(98.5%)
Citrate utilization (Simmons)	Negative	(100%)
Lysine decarboxylation (Moeller's)	Negative	(100%)
Carbohydrate fermentation: glucose	Acid & gas	(100%)
arabinose	Acid & gas	(100%)
xylose	Negative	(100%)

Sex & race distributions

About 61% of the 67 cases were males while 39% were females. Out of the four ethnic groups, Chinese predominated with a 79%, while the remaining 14 cases (21%) belonged to Indians, Malays and others.

DISCUSSION

A total of 67 paratyphoid-A cases (confirmed by positive cultures from clinical specimens) was reported in 1979. The sharp rise over the past years (Table 1) was attributed to a sudden increase in the second half of the year (Table 2) during which time the strains also became untypable against the standard range of phages. About 70% of the total strains were untypable and 87% of these belonged to the age-group between 15 and 35 year-old (Table 3). As shown in Table 4, the biochemical characteristics (37 C incubation within 24 hours) were consistent with the typical strains of *S. paratyphi-A*. Only one strain was found to produce a small amount of hydrogen sulphide within 24 hours.

Clinically, the infection was similar to typhoid, and like the local strains of *S. typhi*, the *S. paratyphi-A* was 100% susceptible to most of the antibiotics except for tetracycline (97%) and triple-sulpha (4%).

REFERENCES

- Anderson E.S. and Williams R.E.O.: Bacteriophage typing of enteric pathogens and Staphylococci and its use in epidemiology. *J. clin. Path.* 9: 94-127, 1956.
- Bauer A.W., Kirby W.W.M., Sherris J.C. and Turck M: Antibiotic susceptibility testing by a standardized single disc method. *Amer. J. Clin. Path.* 45: 493, 1966.