

## FOOD-POISONING CAUSED BY *SALMONELLA HADAR*

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### ABSTRACT

A food-poisoning outbreak in a family caused by *Salmonella hadar* was reported. Mutton rice was incriminated as the source of the infection. The strains isolated from stools of 5 members belonged to type 2. This is the predominant phage type found in man and turkeys in England and Wales, where *S. hadar* is now a common cause of salmonella food-poisoning.

### INTRODUCTION

In September 1981, an outbreak of food-poisoning caused by *Salmonella hadar* occurred in a family. The organism was isolated from five of the six members affected with severe diarrhoea. The cause of infection was attributed to the consumption of mutton rice which had been left at room temperature without refrigeration from the previous day. *S. hadar* has not been isolated in Singapore before.

According to a report by Rowe et al. (1) in 1980, *S. hadar* has become a major cause of food-poisoning in England and Wales since 1976. Before 1971, only a few strains were isolated from man and none from animals. In view of the recent increase in the isolation rate (1600 strains were identified in 1979), a phage-typing scheme has now been developed to provide a more precise surveillance of food-poisoning outbreaks and a comprehensive study of the epidemiological spread of *S. hadar*. The common source of infections was often traced to fowls, especially turkeys. Most of the strains isolated from man and turkeys in Britain were found to belong to phage-type 2.

This paper reports the first outbreak of food-poisoning in Singapore caused by *S. hadar*.

### CLINICAL PRESENTATION

All members of the family developed acute gastroenteritis after consuming mutton rice left over from the previous day. They were admitted to Middleton Hospital on 11.10.81. On admission, their general condition was fair and they were not clinically dehydrated. Half of them complained of abdominal pain, two had low-grade fever and another two had nausea. The stools had no blood or mucus. Although all six patients had diarrhoea, *S. hadar* was recovered from five of them. Their condition improved after symptomatic treatment was given and they were discharged on 15.10.81.

### MATERIALS AND METHODS

The patients' stools were examined for the presence of bacterial enteric pathogens in Selenite F broth, alkaline peptone water (with 2% NaCl added), MacConkey and blood agar. For secondary sub-culturing, eosin methylene blue and thiosulphate citrate bile salts sucrose agar media were used. The *S. hadar* was identified by biochemical reactions and confirmed by agglutination reaction against diagnostic antisera. All test cultures were incubated at 37 C for 24 hours except where indicated.

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Antibiotic-susceptibility testing of the strains was performed according to the Bauer et al method (2) using Sensi-Discs (BBL), except that each cell suspension in normal saline was streaked on the agar surface with a cotton swab in three different planes.

Phage-typing of the *S. hadar* strains was done by the Division of Enteric Pathogens, Central Public Health Laboratory, Colindale, London.

**RESULTS**

Results of laboratory studies in Tables 1 and 2 showed that 5 strains of *S. hadar* shared similar reactions biochemically and in antibiotic susceptibility.

**Phage-typing**

All five strains of *S. hadar* isolated from the outbreak belonged to type 2.

**Table 1. Biochemical characteristics of the five *S. hadar* strains.**

Kligler's iron agar	K/A, gas	
Hydrogen sulphide	+	
Indol	-	
Methyl red	+	
Voges Proskauer (Barritt's)	-	
Citrate (Simmons)	+	
Urease (Christensen)	-	
Motility (Edwards & Ewing)	+	
Decarboxylases (Moeller):	lysine	+
	arginine	-
	ornithine	+
Fermentation:	glucose	Acid & gas
	lactose	-
	sucrose	-
	maltose	+
	mannitol	+
	dulcitol	-
	sorbitol	+
	inositol	+
	raffinose	+
	rhamnose	+
	arabinose	+
	trehalose	+
cellobiose	-	
salicin	-	

**DISCUSSION**

In recent years, *S. hadar* has become the second most common salmonella serotype isolated from cases of food-poisoning in England and Wales. In Singapore, this serotype has neither been isolated from man nor animals before

**Table 2. Antibiotic susceptibility testing of the five *S. hadar* strains with BBL Sensi-Discs.**

	Disc potency	Sensitivity
Chloramphenicol	30 mcg.	S
Ampicillin	10 mcg.	S
TM/SMX	25 mcg.	S
Tetracycline	30 mcg.	S
Neomycin	30 mcg.	S
Gentamicin	10 mcg.	S
Kanamycin	30 mcg.	S
Streptomycin	10 mcg.	R
Triple-sulfa	250 mcg.	R

  


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TM = trimethoprim ( 1.25 mcg.)  
 SMX = sulphamethoxazole (23.75 mcg.)  
 S = sensitive  
 R = resistant  
 BBL = Baltimore Biological Laboratory

(personal communication with Dr. C.L. Poh, City Veterinary Centre). Our local strains belonged to phage type 2, which is also the most prevalent phage type found in man and turkeys in England and Wales (1), and Canada (3). Majority of the English strains were dulcitol-positive, while the Canadian strains and those isolated locally failed to ferment dulcitol.

The antibiotic susceptibility pattern of the local strains is shown in Table 3. Most of the strains were susceptible to the antibiotics routinely tested for enteric pathogens, except streptomycin and triplesulfa.

The mutton rice was most probably the source of the infection in this family outbreak of food-poisoning because 5 of the 6 members who consumed it including a 15 month-old infant were infected with the same salmonella serotype, *S. hadar*.

**REFERENCES**

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