

An outbreak of salmonellosis amongst holidaymakers in Madeira, July 1988

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SUMMARY

In July 1988, 20 of 49 tourists from Northern Ireland became ill with gastro-intestinal symptoms while on holiday in Madeira and four were admitted to hospital. Salmonella enteritidis was subsequently isolated from eight members of the party. Epidemiological investigations implicated fried and/or scrambled eggs as the vehicle of infection

INTRODUCTION

On 12 July, 49 people from Northern Ireland went on a package holiday via Gatwick to the same hotel in Madeira. On Sunday 24 July, approximately 70 hotel guests of varying nationalities became ill with abdominal cramps, vomiting and diarrhoea. At least 15 guests, including one from Northern Ireland, were admitted to the local hospital. Of the 48 holidaymakers who returned home to Belfast on 28 July three had severe gastrointestinal symptoms and had been advised by a doctor in Madeira 'to go straight to hospital' on arrival home. The sick passengers informed the flight crew on the Gatwick/Belfast flight of their illness. Therefore when the aeroplane landed it was met by a community physician and an environmental health officer. They arranged the transfer of the three passengers with severe gastrointestinal symptoms to Belvoir Park Hospital. In addition, an investigation was initiated to document the nature and extent of the outbreak as well as the vehicle of infection.

METHODS

Epidemiological

The three patients in hospital were visited by a community physician, and a detailed clinical and food history was elicited. The party leader was also visited and this combined information was used to construct a postal questionnaire which was sent to each member of the party. This sought information on symptoms arising while abroad, the hotel restaurant used, and details of food eaten in the hotel between 22 and 24 July. A case was defined as a person who

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had vomiting and/or diarrhoea associated with abdominal pain while staying in that hotel in Madeira. The hotel management was requested to supply details of all food served in the 72 hours preceding Sunday 24 July, but unfortunately this information did not become available until after the questionnaires had been distributed.

Microbiological

The names and addresses of the holidaymakers in this party were obtained at the airport. Home visits and the collection of faecal specimens were arranged by the Area Departments of Community Medicine.

Environmental

Information on the hotel and its menu were obtained from patients and the party leader.

RESULTS

Epidemiological

A total of 43 (88%) questionnaires were returned. Twenty (47%) admitted to having had some form of stomach upset while abroad; 19 had diarrhoea, 12 had abdominal pain, nine had nausea, seven had vomiting and five reported fever. Only 14 replies met the case definition. The cases were aged between 36 and 72 years (mean 60.3 years). The dates of onset of symptoms ranged from 18 to 25 July with a peak on 24 July. Of the 14 cases, nine had consulted a doctor while abroad, six received antibiotics and four were admitted to hospital with a length of stay of 8–13 days.

Food-specific attack rates based on food consumed between 22 and 24 July were calculated (Table). A statistically significant association was demonstrated between gastrointestinal illness and the consumption of fried and/or scrambled egg. No significant association was detected between illness and eating boiled eggs or omelette. Three cases developed symptoms before 22 July and these were excluded from the analysis. Gastrointestinal illness in the Northern Ireland party was not significantly associated with the use of any particular restaurant in the hotel.

TABLE
Food-specific attack rates for food eaten 22 – 24 July

<i>Food</i>	<i>Ate</i>			<i>Did not eat</i>			<i>p</i>
	<i>Ill</i>	<i>Not ill</i>	<i>Attack rate %</i>	<i>Ill</i>	<i>Not ill</i>	<i>Attack rate %</i>	
Fried egg	7	5	58	0	15	0	0.0009
Boiled egg	4	6	40	1	14	7	NS
Scrambled egg	9	5	64	0	16	0	0.0001
Omelette	7	11	39	2	11	15	NS
Mousse	3	8	27	4	10	29	NS
Chicken (cold)	4	14	22	3	6	33	NS
Chicken (hot)	4	18	18	2	2	50	NS

Microbiological

Faecal samples were obtained from 20 people who had been symptomatic and *S enteritidis* was isolated from eight. Of these all met the clinical case definition and included the four patients who were admitted to hospital. Five of the eight positive samples were subsequently phage-typed; four were phage type PT4 and the other PT7.

Environmental

The hotel had accommodation for more than 500 people. The party from Northern Ireland stayed on a half-board basis and tended to lunch away from the hotel. There were three main restaurants in the hotel but food was also served at some of the bars. The menu rotated on a fortnightly basis with a choice of about four foods per course. Eggs were always on the breakfast menu.

The outbreak was investigated by Madeira public health officials who visited the hotel on Monday 25 July. They interviewed cases and various food samples, including eggs, were obtained for analysis. *Salmonella* was not isolated from these samples. However, *Salmonella* group D was isolated from stool samples of some of the affected guests. Information on kitchen facilities and hygiene was not available. The local investigators suspected scrambled eggs as being the cause of the outbreak but this was not proven.

DISCUSSION

It is difficult to investigate an outbreak of food poisoning occurring in another country, but this incident provides an opportunity to document morbidity amongst a group of returning holidaymakers. This has been performed elsewhere, notably in Glasgow where 45% of passengers at Glasgow airport returning from package holidays stated that they had been ill while on holiday, or shortly after their return, gastrointestinal symptoms accounting for most of all illnesses.¹ Illness on holiday is common and, with the continued growth in air travel, particularly the number of holiday destinations served by Belfast International Airport, it becomes even more pertinent to enquire about a person's travel history.

The return flight was via Gatwick and although three passengers were obviously distressed, neither they nor their friends mentioned their condition to the cabin crew on the Madeira – Gatwick flight. Had they done so, it is likely that they would have been detained at Gatwick and medical attention sought, but they chose to wait until they were approaching Belfast. This aspect of human nature would have had more important implications for communicable disease control had they been suffering from a more serious communicable disease, or if it had been a long-haul flight. Modern aeroplanes can accommodate up to 500 passengers and some non-stop intercontinental flights may last 12 hours or more. If some passengers have an acute diarrhoeal illness it can impose enormous strain on sanitary facilities, making personal hygiene less easy and increasing the potential for person-to-person spread.

Although the hotel was asked to forward details of all food served in the hotel on 22–24 July the information was incomplete since it did not include breakfast items or food served at the numerous bars in the hotel. Thus it was impossible to elicit from the menu the exact nature of some of the food served and it provided little additional information to that already obtained from detailed case histories.

The epidemiological investigation showed an association between illness and the consumption of fried and/or scrambled eggs and the microbiological investigation

confirmed the organism as *S enteritidis* PT4 and PT7. In this outbreak a narrow clinical case definition was used to exclude the minor gastrointestinal illnesses which occur abroad. Nineteen (44%) of the passengers had diarrhoea while in Madeira. Holidaymakers involved in this epidemic appeared to have a severe infection as a high proportion were admitted to hospital.

Salmonella enteritidis was isolated from eight cases, all of whom had eaten scrambled egg in the three days prior to illness, and seven stated that they had definitely or probably eaten fried egg during the same period. Some of the party commented that the scrambled egg was often cold or lukewarm. However, their comments may have been biased following remarks made by a local doctor implicating scrambled egg. Approximately six weeks after this outbreak, two English tourists staying in the same hotel became unwell and *S enteritidis* was subsequently isolated from them.

This investigation again highlights the association between *S enteritidis* and eggs.² Although the public in the United Kingdom has been advised to eat well-cooked eggs, it may be prudent to extend this advice to those who holiday abroad. This study illustrates the methodology used in the investigation of an outbreak of gastrointestinal illness and also demonstrates the close co-operation that exists between community physicians, laboratories, clinicians and environmental health officers.

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