Outbreak of salmonella food poisoning at Junior World Rowing Championships

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Abstract

This paper describes an outbreak of *Salmonella enteritidis* occurring at the Junior World Rowing Championships at Poznan, Poland, in August 1995 which was to have a significant effect on the performance of several of the largest national teams.

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Key terms: rowing; gastroenteritis; salmonella enteritidis

At junior level, athletes usually only have one year when they can qualify to represent their country, and qualification depends on about 10 months of intensive training as well as costs in the region of £1000. This year infection rendered 10% of the athletes either unable to compete or significantly weakened, with a deleterious effect on championship results.

Poznan has an excellent modern rowing course. Our accommodation, however, was in a dingy multistorey student residence. Floors and bathrooms were dirty and the food was of poor quality and cooked badly. The serving staff had little idea of hygiene, handling food and eating behind the counter. There was little evidence of refrigeration despite the fact that the ambient temperature varied between 20° and 30°C. Because of the quality of the food the competitors were soon supplementing their diet at MacDonald's—a recent introduction to the town. Food in the restaurants was cheap and of good quality.

The outbreak

Three days before the racing started and two days after arriving, team members began to present with headache, pyrexia of up to 39°C, diarrhoea (often bloody), muscle pain, nausea, and vomiting. Over three days eight athletes and eight coaches fell ill and it was necessary to substitute six athletes after the competition started.

During July 31 it became apparent that other teams were affected, some worse than Great Britain, and by August 2 the full severity of the outbreak was apparent, with crews rowing with substitute oarsmen, and there was the strange sight of boats racing in the heats with crew members missing. Throughout the championship, I had 104 consultations relating to gastroenteritis.

I treated our athletes with Dioralyte rehydration solution, loperamide, cinnarizine, paracetamol, and ciprofloxacin. The German doctor treated six team members with intravenous fluids while in their rooms. Five athletes from other teams required hospital admission. As

soon as gastroenteritis had been recognised I saw the whole team and advised on meticulous hygiene, with the introduction of a bathroom cleaning rota.

I collected illness statistics at the end of the championship from each team (table).

The Polish Organising Committee called in the public health authorities and it was discovered that the infective agent was *Salmonella enteritidis*. The source was thought to be a carrier who was working in the kitchen. The food infected was a dish of egg mayonnaise with chives and a meat and cream sauce served 12 hours before the onset of symptoms.

Salmonella enteritidis

Salmonellae are Gram negative bacilli growing aerobically and anaerobically at an optimum temperature of 37°C and they are readily killed by temperatures above 55°C. They have been isolated from the intestines of man and animals and from food of animal origin, such as meat, and eggs.¹ *Salmonella enteritidis* phage type 4 (implicated in this outbreak) is the most common pathogen associated with outbreaks of food borne disease in Europe in recent years.^{2,3} Salmonella infection causes a gastroenteritis of varying severity, depending of the susceptibility of the individual, with an incubation of 6-72 hours or more and depending on food type and dose of organisms.⁴ Salmonellae caused 13 of the 15 deaths from food poisoning in England and Wales during 1992-3.⁵

Mayonnaise is made by emulsifying together raw egg, oil, and vinegar or lemon juice. Depending on the eventual pH of the liquid it can be ideal for bacterial growth and it should be eaten within a short time of preparation (one to two hours) unless stored in a refrigerator. Many mayonnaise associated salmonella outbreaks have been reported.^{4,6}

Discussion

Whether the kitchen worker implicated as the carrier started the outbreak or was another victim is uncertain, given the frequency with which *S enteritidis* phage type 4 has been associated with egg and egg based foods. However, it was likely that poor standards of hygiene, such as inappropriate storage, cross contamination from uncooked to cooked foods, or inadequate cooking, were to blame.

It is obvious that the athletes, having suffered salmonella food poisoning, could not become race fit in a few days. I have no doubt that this outbreak had a major detrimental impact on the performance of some of the largest teams in the competition. The British team suffered 50% illness in its best boats, and our most promising athlete watched his boat missing a

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Table 1 Illness statistics

Country	Ill athletes	Total athletes in team	Per cent athletes ill	Ill coaches, doctors, and management
South Africa	9	14	64	1
Rumania	9	17	53	4
Argentina	1	2	50	1
Yugoslavia	6	16	38	—
Germany	16	52	31	10
Bulgaria	5	20	25	3
Australia	10	42	24	6
Portugal	3	13	23	2
Czechoslovakia	9	41	22	7
Great Britain	8	38	21	8
Brazil	1	10	10	3
France	1	16	6	—
Total	78	780 (including all teams)	10	45

medal, sitting in the grandstand with a pyrexia of 38°C. Several larger teams take spare athletes as reserves, but this policy would not have helped in this situation.

Although food poisoning can occur anywhere, it may be false economy for teams to choose the cheaper accommodation and facilities, particularly when competing in countries where there is inexperienced management and financial constraint.

Many international travellers and some sporting teams take prophylactic antibiotics when travelling in areas where traveller's diarrhoea is common. Ciprofloxacin (Ciproxin) 500 mg once daily afforded 94% protection in a double blind placebo controlled study.⁷ While possessing good antibacterial activity against salmonella species, ciprofloxacin has poor activity against the normal anaerobic stool flora. However, Bayer inform me that they are not licensed for the prophylactic use of Ciproxin.

All aspects of international rowing are the responsibility of the Fédération Internationale des Sociétés d'Aviron (FISA), based in Switzerland.

At the FISA meeting following the Championships, the President of FISA made a statement to congress apologising for the outbreak of food poisoning and said that FISA had set up a task force to look at health and hygiene. I believe FISA should have assessed the Polish Organising Committee's accommodation and catering arrangements and seen that they were inadequate. FISA must be responsible for ensuring that the athletes are not put at any risk, particularly at junior level. FISA should insist on having an overriding power to "wade in" with specialist help, and should be ready to aid the organising committee should any similar problem develop in the future.

The team doctors at this competition felt there should be a system of notification of any infectious conditions occurring during the competition and that there should be frequent medical meetings; athletes without their own doctor should be encouraged to consult one of the other doctors present.

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