His diet consisted of West Indian and European food, but he said that he cooked all eggs well. When he was seen in the outpatient department he was specifically asked if he drank egg nog, and he then admitted drinking it frequently, using a recipe of raw eggs, brandy, sugar, milk, and vanilla essence.

Comment

We can find no previous reports of *S enteritidis* infection presenting as an eyelid abscess. Probably our patient had a subclinical gastrointestinal infection and subsequent bacteraemia with distant seeding possibly in a rudimentary frontal sinus. Gastrointestinal infection with salmonella is more likely to lead to bacteraemia in those with underlying disease, especially gastric disorders. It is also much more common in the over 70s, the rate of bacteraemia in this age group being two to four times that in young adults.[1,2] Although rare, with the great increase in *S enteritidis* infections extraintestinal infection is likely to become more common, especially in elderly and ill patients. In such cases the possibility of underlying osteomyelitis should be considered as it has important therapeutic implications, needing prolonged treatment with antibiotics and often an operation. Salmonella osteomyelitis is classically associated with sickle cell anaemia, though our patient's haemoglobin was normal. In about two thirds of cases salmonella osteomyelitis affects the long bones.[3] One case of frontal bone osteomyelitis caused by *S paratyphi* has been reported.[4]

From 1981 to 1986 the proportion of salmonella infections caused by *S enteritidis* rose from 11% to 28%.[5] This rise was due mainly to a rise in phage type 4 infections; transmission of this phage type has been increasingly associated with poultry, and it is now known to be transmitted in eggs. Egg borne *S enteritidis* is destroyed by thorough cooking. The raw egg in the egg nog may have been the vehicle of infection. Unless specifically asked for a history of egg nog drinking may not emerge on dietary questioning.

We thank Dr P Isphani for her help with the case, Professor J Hampton for permission to report the case, and Suzanne Watson for typing the script.

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"Let's twist again"

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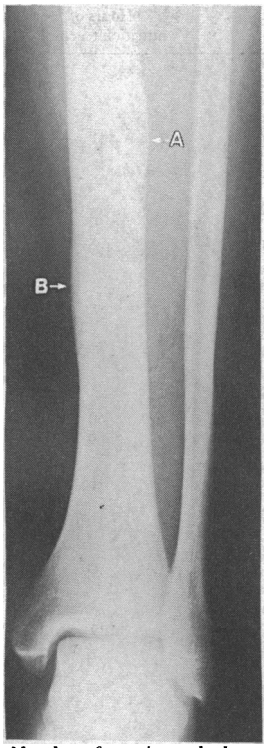
Delayed *x* ray pictures may be imporant in patients in whom stress fractures are suspected. The full *x* ray picture should be studied even when one site of fracture is found because spiral stress fractures are possible, though rare.

Case report

A 21 year old man presented to the accident and emergency department complaining of severe pain in his left lower leg. A week previously, while on holiday abroad, he had hurt his leg when disco dancing. He admitted to many "heavy dancing sessions" lasting several hours, including dancing with his girlfriend on his shoulders, during his holiday. The pain had been sudden and severe and persisted when he returned to the United Kingdom. A stress fracture was suspected, but *x* ray pictures did not show any abnormality so he was advised to rest. Three days later his lower leg was warm to touch and seemed mildly inflamed without bony tenderness. After a further four days he complained of persistent, worsening pain in his lower leg with difficulty in bearing weight. An isotope bone scan showed distinct irregular uptake in the distal half of his left tibia extending to the ankle joint. The appearances were not classic for a stress fracture, and secondary osteomyelitis was considered a possibility.

The patient was systemically well, with no fever, a white cell count of $6{\cdot}3 \times 10^9/l$, and an erythrocyte sedimentation rate of 1 mm in the first hour. A second plain *x* ray picture of the lower tibia showed a periosteal reaction at the midshaft. He was therefore treated conservatively and advised to use the leg gently with crutches. Three months after the initial injury he had recovered fully. Another plain *x* ray picture showed an unusual appearance. There were two areas of periosteal reaction, one above the other but on either side of the tibia, suggesting that the initial injury was a spiral stress fracture (figure). With hindsight the second area of periosteal elevation (corresponding to B in the figure) could be seen in the second plain *x* ray picture.



New bone formation on both sides of tibia suggesting spiral fracture

Comment

There are two main theories about the cause of stress fractures.[1] Firstly, the fatigue theory states that muscles pass their peak of endurance during protracted effort and are no longer able to support the skeleton; the load is therefore transferred directly to the bone. Secondly, the overload theory states that muscle groups when contracting cause the bones to which they are attached to bend like a drawn bow. After repeated contractions the innate strength of the bone is exceeded and it breaks. Morris suggests that within the first two weeks of symptoms the bone undergoes osteoclastic activity resulting in local osteoporosis.[2] Periosteal and endosteal calluses then begin to form. Excessive stress during the stages of osteoporosis or early callus formation may result in a cortical crack or a complete fracture. Swelling, occasionally to the point of pitting oedema, occurs and is often rather diffuse. Less commonly, the affected part is erythematous with an associated increase in temperature on palpation as was noted in our case.

Symptoms begin insidiously in half of cases and acutely, without apparent injury, in the other half. Two fifths to a half of *x* ray pictures show changes initially, but first signs may be evident only after three to four weeks. Our patient was typical in his presentation, but spiral stress fractures are quite unusual. We could find only one other reported case.[3]

I thank Major General Kirby for his help in compiling this report and Miss J Clancey for her typing skills.

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