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Salmonella Michigan soft tissue infection in an immunocompromised child

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ABSTRACT
A rare case of soft tissue infection due to Salmonella Michigan in an immunocompromised child is reported. The same organism was isolated from a tortoise kept in the home. Immunocompromised patients are especially susceptible to reptile-associated salmonellosis and should be advised appropriately.

A 12-year-old boy was diagnosed in October 2005 with a low-grade glioma. As the tumour was non-resectable, he commenced chemotherapy with vincristine and carboplatin in November 2005. He required a syringoperitoneal shunt, further chemotherapy with vincristine, cyclophosphamide and cisplatin, and subsequently temozolamide and radiotherapy. In September 2006 he then required a further syringoperitoneal shunt to control symptoms. Soon after the shunt was inserted he became neutropenic, but his neutrophil counts rose in the following few weeks to between 4×10⁹/l and 5×10⁹/l.

The boy then developed a non-erythematous swelling at the lateral edge of the abdominal wound of the most recent cervical syringoperitoneal shunt. This area subsequently became inflamed and discharged pus. Swabs were sent to Microbiology for culture and were plated onto blood agar and chocolate agar (incubated aerobically for 24 h in 5% carbon dioxide at 37°C), and a nalidixic acid blood agar plate (incubated anaerobically at 37°C for 48 h). Cultures of two successive wound swabs revealed a growth of Klebsiella pneumoniae and Salmonella ser. Michigan. No other Salmonella spp was isolated from the other animals.

As the patient was not found to be a faecal carrier, infection was probably as a direct result of hand contamination of the wound in a patient with damaged skin due to eczema and previous staphylococcal infection.

DISCUSSION
Salmonella enterica subsp. enterica serovar Michigan (serotype I 17:1, v:1,5) was first described in Michigan by Juenker and Caldwell (cited in oral communication, E de Pinna, HPA, 8 December 2006). It is a rare cause of human salmonellosis, isolated infrequently from human sources in the USA but not previously reported from animal sources.4,5 It has not previously been reported in the UK (oral communication, E de Pinna, 8 December 2006). There have been no reports since it was first described.

Salmonella enterica is a known cause of skin and soft tissue infection; focal infection typically results from bacteraemia following gastrointestinal infection.6,7 However its occurrence in the absence of gastrointestinal infection is rare and is almost exclusively associated with immune compromise.7 Two cases have been described of soft tissue infection without gastrointestinal symptoms in otherwise healthy children.8,9

The incidence of reptile-associated salmonellosis is well documented. It is thought that over 90% of all reptiles carry Salmonella spp, usually asymptptomatically,10 and are often colonised with rare serotypes such as Java, Marina, Stanley, Poona and Chameleon.11 As a proportion of overall cases
of human salmonellosis, rates of reptile-associated infection have been reported as high as 7%. Serious sequelae may result from invasive infection, especially in young children, pregnant women and the immunocompromised, such as septicaemia, meningitis and spontaneous abortion. These sequelae, which may occur with any form of salmonellosis, are more common in reptile-associated disease. Transmission may arise from direct contact with the animal, or from indirect contact with family members or with the reptile’s droppings. Poor hand hygiene has a role to play in the spread of infection. Infection has been shown to be independently associated with both direct contact with the animal and with having a reptile or amphibian in the home. Attempts to eliminate carriage in reptiles with antibiotics have been unsuccessful.

In the early 1970s, reptile-associated salmonellosis accounted for around 18% of all cases of salmonellosis in children in the USA, with around 15 million turtles being sold per year. In the USA, the Food and Drug Administration banned commercial distribution of small turtles in 1975 due to increasing public health concerns, resulting in a reduction of around 100 000 cases. It was thought that larger turtles posed a lesser threat, as children are unable to fit them in their mouths. However, a more recent increase in the rates of infection prompted the Centers for Disease Control and Prevention to issue guidelines around contact with reptiles and amphibians, and it has recommended that immunocompromised patients and young children avoid contact and do not keep such animals in their homes.

This case report highlights the importance of infection control procedures in the home to prevent infection in immunocompromised patients. Advice needs to be given to parents and older children regarding avoiding handling such pets when immunocompromised, and hand hygiene if contact occurs. The importance of cross-infection from other family members also needs to be highlighted. Advice is given on our oncology unit regarding such issues by way of an information leaflet and informal discussion once an initial diagnosis has been made.

This rare serotype of Salmonella has not previously been described in reptile-associated disease; practitioners should be aware of the risks to children and immunocompromised patients from contact with reptiles, and advise on appropriate infection control practices in the home.

Competing interests: None.

Patient consent: Informed consent has been obtained for the publication of the details in this report.

REFERENCES