Salmonella perils of pet reptiles

Linda Ward

Salmonella enterica is a major cause of gastroenteritis in humans, and many of the infections originate in food-producing animals that are infected with salmonella. Members of the public are less likely to know that domestic pets, birds, and rodents also harbour salmonellas.

Cold blooded animals, including tropical fish and reptiles (which are becoming more common as ‘exotic’ pets), have been recognised as a source of human salmonellosis for almost forty years. S. enterica was isolated from snakes in 1944 and from ‘turtles’ (definition includes tortoises and terrapins) and lizards in 1946. The first human salmonella infection associated with a turtle was reported in the United States (US) in 1963. Well over 90% of all reptiles may carry S. enterica and up to five different serotypes have been isolated from a single reptile. Infections in reptiles are usually asymptomatic and excretion rates for the organisms may vary considerably, making it difficult to establish whether the reptile is a carrier. There have also been reports of symptomatic salmonellosis in reptiles, but feeding experiments in snakes, tortoises, and lizards failed to produce disease and resulted only in faecal shedding of the pathogen. While reptiles must be considered to be asymptomatic carriers of S. enterica the organisms they shed intermittently in faeces can cause serious illness in humans.

There are over 2400 different salmonella serotypes. Most belong to subspecies I and cause infection mainly in humans and other warm blooded animals. S. enterica carried by reptiles are usually rare serotypes and often belong to S. enterica subspecies II, S. enterica subspecies IIIa and IIIb, (the Arizona group), and to S. enterica subspecies IV. S. enterica Paratyphi B variant Java (= S. Java), which belongs to subspecies I, however, has been linked to reptiles (particularly tortoises and terrapins) for many years and has been responsible for many infections in children. In recent years this serotype has also caused human infections in association with tropical fish tanks (author’s unpublished data).

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Young children who acquire salmonella infections from reptiles may develop invasive illness including sepsis and meningitis. An increase in the numbers of cases of salmonellosis associated with exotic pets in children and infants is causing concern in England and Wales. In the past three months the PHLS Laboratory of Enteric Pathogens reported on six cases (5 children and 1 adult) who acquired infection from reptiles. Three infants developed meningitis, and one died following infection with S. Rubislaw. An outbreak of S. Tel-el-kebir infection in Ireland associated with terrapins imported from America affected seven children and one adult. In the US the numbers of reported cases of reptile-associated salmonellosis rose fivefold in the late 1990s.

Exotic pets such as iguanas and snakes are becoming popular in the United Kingdom. Reptiles are not generally thought to be cuddly, but children like to handle and pet them, which may result in their hands and fingers becoming contaminated. Infants may be infected indirectly by parents and other family members who have handled the reptile and not washed their hands before feeding or handling the child. Infants and small children may also acquire infection from reptile droppings, particularly if the pet is free to roam around the family rooms.

The following recommendations for reducing risk of transmission of Salmonella spp. from reptiles to humans based on guidelines developed by the Association of Reptilian and Amphibian Veterinarians (ARAV) and the Centers for Disease Control and Prevention in the US could be applied to England and Wales.

- People at increased risk of infection or serious complications of salmonellosis (for example, pregnant women, children of under 5 years of age, and those with impaired immunity), should avoid contact with reptiles.

- Reptiles should not be kept in childcare centres and may not be appropriate pets in households whose occupants are at increased risk of infection.

- Veterinarians and pet shop owners should provide information to potential purchasers and owners of reptiles about the risk of acquiring salmonellosis from reptiles. They should also advise reptile owners always to wash their hands after handling reptiles and reptile cages.

- Reptiles should be kept out of food preparation areas. Kitchen sinks should not be used to bathe reptiles or to wash reptile dishes, cages, or aquariums. If bath tubs are used for these purposes, they should be cleaned thoroughly and disinfected with bleach.

Personal hygiene and publicity about the inherent risk of salmonella infection associated with exotic pets are vital if these serious salmonella infections are to be avoided.

Linda Ward is head of the Salmonella Reference Unit at the PHLS Laboratory of Enteric Pathogens.
‘All the history that you can remember’ from the twentieth century

Stuart Handsides

In a previous article I noted that more landmarks had been offered for the twentieth century than for all the preceding centuries put together. Two reasons for this – these events had occurred too recently to have been forgotten and scientific activity had increased in the twentieth century – were offered recently in the Lancet. ‘Much of the material record of modern medicine must be deliberately discarded so that a manageable amount remains for use by present and future historians’, the author wrote. He noted that between 80% and 90% of all the scientists who have ever lived are alive today, and that the medical publishing record doubles every 12 to 15 years. Somehow, the author argued, the fittest science survives, through repeated exposure by those who find it valuable or diligence of individuals or institutions that keep good records. Increasingly, the problem is accessibility. Eight years ago the then editor of JAMA estimated that two million biomedical articles were published each year (6000 a day). Even if the entire body of scientific knowledge were accessible, who would have the time to read and evaluate even the parts relevant to their field?

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A century, in comparison with a millennium or with all recorded history, seems a very short period. I expect that most readers in 2000 will have known people who were born in the nineteenth century and therefore may have heard stories about what life was like early in the twentieth century. The twentieth was the first century in which photographic and sound records were available from start to finish, increasing the range of material that could be archived. Motion picture records were available for most of the century and the development of radio and television broadcasting (and more recently the internet) created previously unimaginable opportunities for spreading information. The parallel development of powered transport on land and in the air increased the mobility both of people and of infectious diseases.

The twentieth century began when the germ theory of infection was relatively young, and several landmarks in its first 50 years concerned the discovery and use of chemotherapeutic ‘magic bullets’. Microorganisms fought back by acquiring resistance to antimicrobials and, as the century ended, the medical world was on the defensive, devising policies to hold back the advance of antimicrobial resistance. Chromosomes were discovered in 1902, and 50 years later their structure was elucidated. In another ten years the genetic code was cracked, and by the end of the