
County of Los Angeles • Department of Health Services
Public Health
Acute Communicable Disease Control
Special Studies Report 2000

REPTILE-ASSOCIATED SALMONELLOSIS - A CONTINUING PROBLEM

In early September 2000, Los Angeles County (LAC) Acute Communicable Disease Control (ACDC) was contacted by two different public health nurses (PHNs) working in the same health center regarding two cases of *Salmonella* group B in unrelated children. The epidemiological investigation revealed that both families had purchased small red-eared slider turtles at the same local swap meet in the month before their children became ill. The serotype for both cases was later determined to be *Salmonella* ser. San Diego, an uncommon serotype. ACDC receives periodic complaints about the illegal sale of small turtles at swap meets. The two S. San Diego cases, as well as other salmonellosis cases linked to pet turtles, prompted a press release concerning health risks associated with turtles.

The US banned the interstate commercial distribution of pet turtles <4 inches long in 1975 because it was estimated that turtle exposure caused 14% of all salmonellosis cases in the US at that time. In California, regulations prohibiting the sale of turtles <4 inches long (*California Code of Regulation*, Title 17, Section 2612.1) have been in effect since 1972. Enforcement of this ban has been difficult. Turtles and other reptiles have remained popular pets in the US; their popularity appears to increase after movie and television specials about dinosaurs and reptiles.

Long known to carry *Salmonella* bacteria, reptiles continue to be a source of salmonellosis infection in humans who have contact with them. Epidemiological investigations of 990 reported salmonellosis cases in LAC in 2000 revealed that 10% (95 cases) had exposure to reptiles during their incubation period. Turtle exposure was identified in 5% (46 cases), iguana exposure in 2% (16 cases), snake exposure in 2% (20 cases), and other lizard exposure in 1% (13 cases). Of the 95 cases having reptile exposure, 20% (19 cases) were hospitalized.

One of the CDC recommendations for preventing transmission of *Salmonella* from reptiles to humans is that reptiles should not be kept in households where children aged <5 years or immunocompromised persons live.(1,2) During 2000, 42% (40 cases) of LAC salmonellosis cases having reptile contact were under age 5 years.

In 2000, one LAC turtle-associated case, a one-month-old infant with *Salmonella* serotype Berta developed *Salmonella* meningitis and septicemia. The turtle was tested and was culture positive for S. Berta. A second case, a 2-month-old with S. Marina, had no direct exposure to a household pet iguana. The parents were aware of the risk of disease associated with their pet, and tried to take the appropriate precautions, such as restricting the iguana to an area of the home separate from the infant. However, the baby's bottles were washed in the same sink where the iguana's water dish was washed. The iguana was tested and was culture positive for S. Marina.

A common misconception is that direct contact with the reptile is necessary to acquire salmonellosis. Indirect contact with a reptile is also a risk; this may include contact with a person who handles reptiles, contact with surfaces where the reptile may have crawled (floors, cages), or

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contact with areas where reptile implements such as dishes or aquariums may be washed. Salmonellosis has been reported in infants whose bottles were washed in the same sink where the aquarium was cleaned. Severe complications, including meningitis and death, have occurred as a result of *Salmonella* infections in high-risk individuals such as infants, young children and immunocompromised persons.

Since 1997, LAC ACDC has asked that PHNs in LAC collect specimens for culture from reptiles and their environment whenever the investigation reveals that a reptile resides in the home of a reported case of salmonellosis. These specimens may be collected by either the PHNs or by the owner following instructions provided by the PHN. Table 1 represents 18 LAC salmonellosis cases reported in 2000 in which the reptile tested positive for the same serotype as the human case:

Table 1: Lac Reptile with Same *Salmonella* Serotype as Human Case

Serotype	# of Cases	Reptiles Involved	Comments Re: Human Case
S. Typhimurium	4	Iguana, turtle	3 adults in same household; 4 th case: age 11 years
S. Berta	4	Turtles	3 in same household(2 children, age 1 & 4, and adult) 4 th case a 1month old infant with positive blood and CSF
S. Newport	2	Iguana, turtle	Index cases: age 2 & 3 years (different households)
S. Infantis	1	Turtle	Index case: age 1 year
S. Marina	1	Iguana	Index case: age 2 months
S. Beaudesert	1	Lizard	Index case: age 2 years
S. SaintPaul	1	Iguana	Index case: age 3 years
S. Singapore	1	Turtle	Index case: age 7 months
S. Urbana	1	Iguana	Index case: age 8 months
S. B:b: Incomplete	1	Dragon Lizard	Index case: age 7 years
S. Java	1	Iguana	Index case: age 47

Reptiles are known to carry multiple serotypes of *Salmonella*, and often shed the organism intermittently without showing any sign of the disease. Unfortunately, attempts to eliminate

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Salmonella in reptiles with antibiotics have been unsuccessful. During 2000, the following serotypes were isolated from reptiles that were culture positive for a different serotype than the human case: *S. Hvittingfoss* (lizard), *S. Newport* (snake), *S. Bardo* (tortoise), *S. Chameleon* (iguana), *S. 58:1,z13,z28:z6* (bearded dragon lizard).

Persons choosing to live with reptiles should be educated about the risk of salmonellosis and provided with the CDC recommendations for preventing transmission of salmonellosis from reptiles to humans. Parents must take responsibility to supervise all children who are exposed to reptiles, and teach them to wash hands thoroughly after handling any reptile.

REFERENCES

1. Centers for Disease Control and Prevention: "Reptile-Associated Salmonellosis - Selected States, 1996-1998" MMWR November 12, 1999/48(44); 1009-1013.
2. Centers for Disease Control and Prevention: "Errata: Vol. 48, No. 44" MMWR November 19, 1999/48(45); 1051.