SALMONELLOSIS IN REPTILES

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Recently the Centers for Disease Control in Atlanta, Georgia, published a warning to iguana owners to be on the lookout for Salmonellosis in their pet iguanas. Since this article came out our hospital has been inundated with calls from pet iguana owners wanting to know more about the disease. Some have called in a panic wanting to euthanize their iguanas for fear that their children may contract the deadly Salmonella bacteria and die.

Fortunately, although Salmonellosis is a very serious disease, with proper understanding of the problem it is one that can be managed without the necessity of euthanizing cherished family pets. Knowledge of the disease, its symptoms and its control will help veterinarians better educate their clientele.

Salmonella is perhaps the single-most infamous zoonosis associated with reptiles. There are approximately 2,000 serotypes of this gram-negative bacterium. There are three different species within the genus *Salmonella*. *Salmonella typhi* and *S. cholerasuis* have only one serotype each. The serotypes which are considered pathogenic to both man and animals belong to the species *S. enteritidis*.

Over 200 different serotypes have been isolated from reptiles, including aquatic turtles, land tortoises, lizards, snakes and crocodilians.

The red-eared slider was the terrapin that received the majority of the negative publicity. At the time that Salmonellosis was a major disease concern the slider was the most common type of turtle kept as pets in the United States. In the early 1970's it was estimated that about 280,000 cases of human Salmonellosis were contracted from pet turtles. In 1975 the Food and Drug Administration passed a law stating that it was illegal to sell viable turtle eggs or live turtles with a carapace, or shell length of less than four inches in the United States. It was felt that animals larger than four inches in length did not pose the same threat and were still legal for trade.

The disease of Salmonellosis in reptiles is usually asymptomatic. On occasion an animal may develop a loss of appetite, become lethargic or have diarrhea. More commonly, the animal appears healthy and acts as a carrier, infecting other animals and people for up to twelve months by shedding the Salmonella bacteria in its feces.

Salmonella organisms are ubiquitous in nature and are transmitted by the fecal-oral route. An example of animal to animal transmission occurs when two animals are housed together, where one has the Salmonella bacteria and its feces contaminate the food or water supply that the other cagemate is consuming. This occurs frequently in small, crowded cages. In people, contamination occurs when a person places objects or food in their mouths after handling Salmonella contaminated material without utilizing proper hygiene (eg. washing their hands with soap and water).

Salmonellosis is best diagnosed by a veterinarian. Microbiological cultures of the animal's feces, cloaca or blood may identify the organism. A positive test result is diagnostic for the disease, but a negative Salmonella culture can be misleading since the organism may not always be identified, even from a known positive animal. It is wise to recheck all negative animals two or three times, with a two week waiting period between each test, to be certain that the Salmonella organism is not present. Concerned owners are encouraged to set up a screening program with their veterinarian for Salmonellosis and other important reptilian diseases.

Since this is such a dangerous disease it is wise for all reptile and amphibian owners to use meticulous hygiene when handling or working with their animals. I give the following guidelines to all clients with questions regarding Salmonellosis, and especially to those clients where Salmonellosis has been diagnosed on a bacterial culture. It is prudent to make a note in the client's records that this information has been made available to them. If the owner has any symptoms relating to a gastro-

intestinal upset or any questions regarding Salmonellosis in humans refer them to their family physician, and once again document the recommendation in their pet's record.

A Guide to Salmonella Prevention/ Control for Reptile Owners

1. Never eat or put anything in your mouth when working with your animals.
2. Never clean cages in the kitchen or anywhere you prepare food for human consumption.
3. Always wash your hands with a disinfectant soap after handling your animals. Iodine based soaps are available from any pharmacy. Trade names such as Betadyne, Wescodyne, Prepodyne are some of the more common brands available.
4. Have your veterinarian examine sick animals, or perform necropsies (animal autopsies) on animals which die suddenly, to check for Salmonella.
5. Make it a practice to keep cages clean. Proper husbandry and hygiene are fundamental to keeping healthy animals and minimizing disease transmission (this is true for all diseases, not just Salmonella).
6. Young children and people on medical care from their physicians (such as antibiotic therapy, immune suppressive drugs, etc.) should not handle reptiles and amphibians while taking the medications.
7. If you feel that you have been exposed to the Salmonella bacteria, or if you have any questions regarding human Salmonellosis, you are encouraged to see your family physician immediately.

Salmonellosis is not a disease to be taken lightly. It is very serious and can cause death in animals and people. Since this is a zoonotic disease, and there are really no proven treatments in reptiles, our hospital usually suggests euthanizing the clinically affected animals. Although this may seem harsh, it is often a better alternative than potentially risking exposure of this disease to other animals in the household, or worse yet, to humans which come in contact with the infected pet.

The real dilemma, whether or not to treat, arises when a clinically healthy pet tests positive on routine health screens. Since many reptiles can act as carriers, and treating these animals can often result in resistant organisms, inapparent carriers and/or fulminant disease developing, I usually recommend not treating the positive animals. I do, however, recommend strict adherence to quarantine procedures and isolation of the positive animal.

Many different antibiotics against Salmonella have been tried. What usually happens with treatment is that the animal will temporarily stop shedding the bacteria through its feces, and will harbor the disease internally, only to begin shedding it again at a later date. Even animals which have microbiologically tested negative on three separate occasions can potentially harbor and shed Salmonella organisms under certain circumstances.

Our veterinary hospital treats a wide variety of exotic and non-domestic pets every day. It appears that one of our staff members came down with Salmonellosis from handling a sick animal brought to our clinic. The individual became so dehydrated from the associated diarrhea that she had to be hospitalized and placed on intravenous fluids.

Even though we are extremely careful how we handle sick animals, this incident points out that the potential disease threats from animals are real, and everyone that works with reptiles and amphibians should be extremely careful.

To put this whole problem in perspective, veterinarians, veterinary staff and owners are at a greater risk of contracting Salmonellosis from uncooked chicken than they are from handling reptiles if good hygiene is practiced. A conscious effort at maintaining a sanitary work place and animal quarters, with proper attention to personal hygiene will minimize the risk of infection with the Salmonella bacteria.

References

For a comprehensive reference list on Salmonellosis see:

Fox, J.G. 1991. *Campylobacter* infections and Salmonellosis. In: Marcus L.C. *Seminars in Veterinary Medicine and Surgery (Small Animal): Zoonotic Diseases.* 6:212-218.

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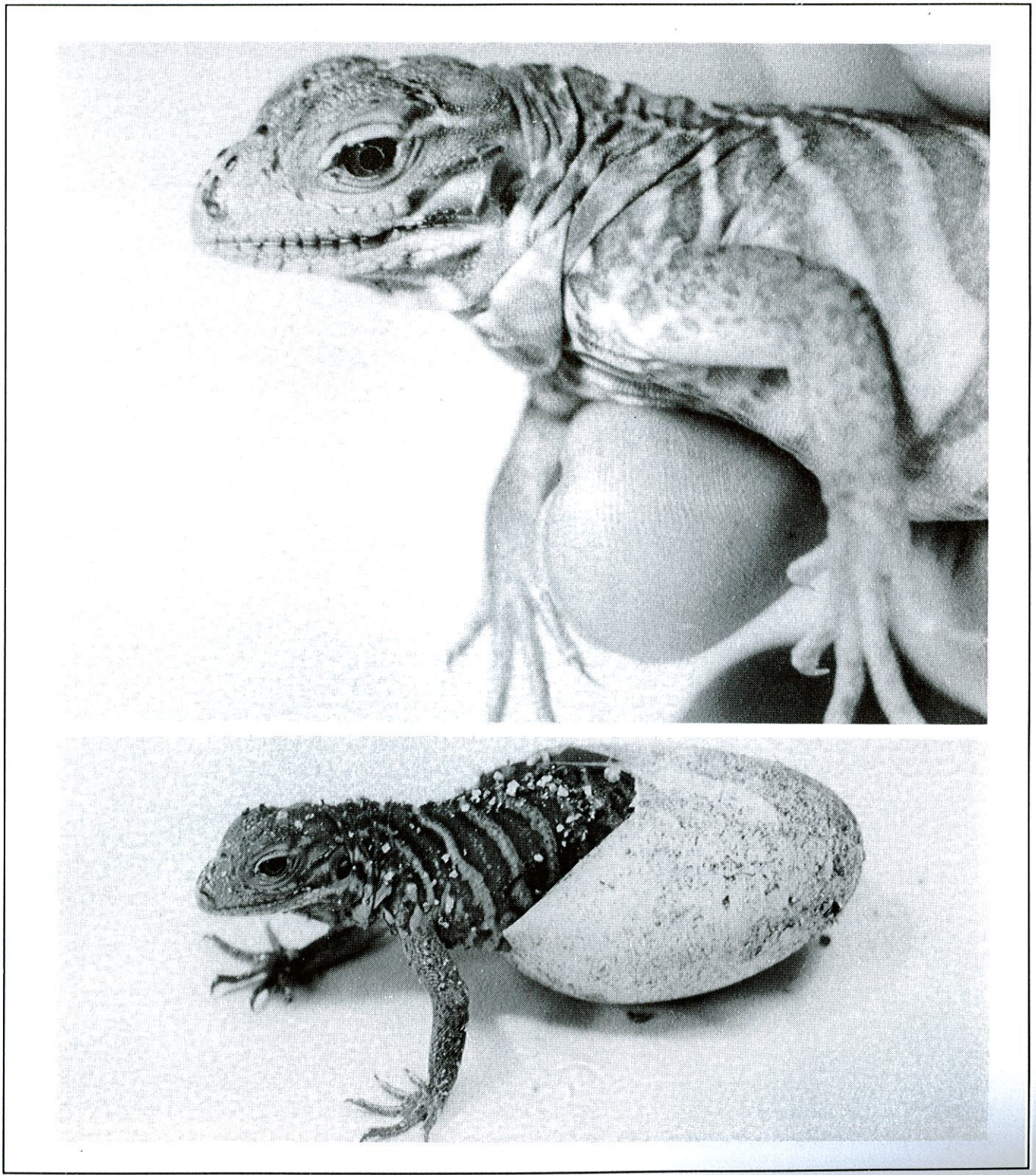

Hatching of a Rhino Iguana, *Cyclura cornuta*, October 1992. *Photograph: Ron Harrod*