Reptile-associated Salmonellosis in Man, Italy

To the Editor: Reptiles are reservoirs of a wide variety of *Salmonella* serotypes, including all S*almonella enterica* subspecies and *S. bongori*. In reptiles born in captivity or kept as pets, *S. enterica* subsp. *enterica* is frequently isolated (*1*). *Salmonella* strains are well adapted to reptiles, and they usually cause asymptomatic infections in such animals, while retaining pathogenicity for warm-blooded animals. For several years, reptiles have been recognized as a source of human salmonellosis. In North America, reptile-associated salmonellosis (RAS) has been reported, particularly in children, the elderly, or immunocompromised persons; severe and fatal infections are described occasionally (*2*). In contrast, only a limited amount of information on RAS is available in Europe. We report a case of RAS that occurred in an adult man in Italy.

A 32-year-old man had symptoms of enteritis. For 2 weeks, he had experienced intermittent watery diarrhea, mild fever, and abdominal pain. He was then treated with ciprofloxacin, and after 15 days of treatment, he recovered from enteritis. A stool sample, collected before treatment, underwent bacteriologic analysis, and *Salmonella* spp. were identified biochemically (api 20E, bioMérieux, Marcy l'Etoile, France) and by a polymerase chain reaction assay specific for the *invA* gene of *Salmonella* spp. (*3*). Since the man was a reptile owner, RAS, rather than a foodborne infection, was initially suspected. He owned several cold-blooded animals; all had been tested for *Salmonella* spp. (at least 3 times at 2- to 3-week intervals), and results were negative. Three weeks before the onset of enteric symptoms, he acquired a boa (*Boa imperator*) that was subjected to routine analysis for *Salmonella* spp. in our laboratories (*1*). *Salmonella* spp. were isolated from a cloacal swab of the snake. Subsequently, both the human and reptile *Salmonella* isolates were characterized as *S. enterica* serovar Paratyphi B. In addition, both strains were found to be d-tartrate–fermenting (dT+) biovars (*4*), susceptible to ampicillin, amoxicillin-clavulanic acid, cephalothin, ceftazidime, gentamicin, streptomycin, chloramphenicol, tetracycline, neomycin, nalidixic acid, norfloxacin, and ciprofloxacin and resistant to sulfamethoxazole and co-trimoxazole.

By pulsed-field gel electrophoresis analysis of DNA, the strains displayed the same pattern, which suggests a clonal origin (*4*). The isolates were also assayed for virulence-associated genes. The *Sop*E1 gene was detected in both isolates, and the *avr*A gene was not detected, which is consistent with an invasive pathovar of *S.* Paratyphi B (*4*). Conversely, the *spv*C, *pef*, and *sef* genes were not detected (*5*).

In recent years, a general increase in RAS detection has been observed, which may be the result of the increasing diffusion of reptiles as pets and a better awareness of RAS risk. In the United States, annual reports of RAS cases are published by the Centers for Diseases Control and Prevention (*2*). In Europe, studies on free-living and captive reptiles have shown a high prevalence of *Salmonella* spp. (*1*). Nevertheless, national surveillance systems for RAS do not exist, and epidemiologic data are incomplete.

Notably, since Sweden became a member of the European Union in 1995, and the import restriction rules for reptiles were removed, a marked increase in RAS was observed in that country (6). As the deregulation of the trade in reptiles is applied, in agreement with the European Union laws, a similar scenario may be projected in other European countries. As is the case for nontyphoid salmonellosis, RAS may be underestimated, especially if patients are not hospitalized. Although a few cases of RAS have been previously reported in children in Italy (*7,8*), this report provides the first description of RAS in adults. *S.* Paratyphi B dT+, also known as *S. enterica* serovar Java, has been isolated in reptiles and tropical fish and has been associated with epidemics of human salmonellosis acquired from food, such as goat milk or chicken (*9*). The evidence shows that salmonellosis by *S.* Paratyphi B dT+ apparently occurs more frequently in adults (*10*), while so-called exotic reptile strains seem to be more prone to causing salmonellosis in children (*7,8*), which has led to the proposition that *S.* Paratyphi B dT+ strains may be highly pathogenic. By screening virulence-associated genes, both our isolates were found to be *Sop*E1+ and *avr*A–, a pattern usually observed in the systemic pathovars of *S.* Paratyphi B (*4*) and associated with invasiveness, which suggests a high pathogenic potential. Accordingly, strict preventive sanitation measures should be adopted when handling reptiles (*2*), and reptiles should be always regarded as a potential source of pathogenic *Salmonella* strains for humans.

Marialaura Corrente,*
Marta Totaro,* Vito Martella,*
Marco Campolo,*
Alessio Lorusso,* Massimo Ricci,†
and Canio Buonavoglia*

*University of Bari, Bari, Italy; and †Agenzia Regionale Protezione Ambiente Puglia, Brindisi, Italy

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Address for correspondence: Marialaura Corrente, Department of Health and Animal Well-being, Faculty of Veterinary Medicine of Bari, Str. prov. per Casamassima, km. 3 70010 Valenzano, BA Italy; fax: 39-080-467-9843; email: m.corrente@veterinaria.uniba.it

Congenital Visceral Leishmaniasis

To the Editor: Visceral leishmaniasis (VL) is usually transmitted by phlebotomine sandflies. Nonvector transmission occasionally occurs through blood transfusions, contaminated needles of drug users, organ transplants, or laboratory infection (*1*). Only a few cases of congenital transmission have been reported. We describe a case of VL in a German infant, who never had been to a VL-endemic area. Most likely, the parasite was congenitally transmitted from the asymptomatic mother to her child.

A 9-month-old girl had a 4-week history of intermittent fever, recurrent upper respiratory tract infections, and failure to thrive. Physical examination showed a distressed infant with bilaterally enlarged cervical lymph nodes, hepatosplenomegaly, and a rectal temperature of 40°C. The following laboratory results were remarkable: hemoglobin 6.4 mg/dL, erythrocyte count 3.3 million/μL with 10.9% reticulocytes, platelet count 74,000/μL, and leukocyte count 4,300/μL (29.8% neutrophils, 62.3% lymphocytes, 7.4% monocytes, 0.5% basophils, and 0% eosinophils). Serum electrophoresis showed pronounced hypoalbuminemia and hypergammaglobulinemia. Abdominal sonography verified hepatosplenomegaly. Cultures from blood and other materials as well as additional investigations for a wide spectrum of infectious diseases, including HIV infection, were negative. Leukemia was suspected, and a bone marrow biopsy was performed. It showed enhanced myelo-, erythro-, and thrombopoesis with slight lymphopenia but no leukemic cells. However, *Leishmania* amastigotes were detected in bone marrow macrophages at a density of ≈1 to 2 parasitized macrophages per 400× oil immersion field, corresponding to a Chulay score of 1+ (*2*). Serology was positive for *Leishmania* spp. by indirect immunofluorescence antibody test, with cultured promastigotes of *L. donovani* used as antigen (immunoglobulin G [IgG] antibody titer 1:1,024). Specific antibodies against 14- and 16-kDa proteins of *L. infantum* promastigotes (Figure) were confirmed by immunoblot (*3*). Polymerase chain reaction (PCR) on scrapings of stained bone marrow slides amplified a *Leishmania* spp.–specific sequence of the internal transcribed spacer-1 gene (*4*), and subsequent *Hae*III-restriction fragment length polymorphism helped identify the species as *L. infantum* (Figure). Liposomal amphotericin B, at a daily dose of 4 mg per kg body weight, was given by infusion on 6 consecutive days and repeated on days 14 and 21. The therapy was well tolerated. Within 3 days, the fever subsided. The child recovered completely, and blood cell counts reached normal values 5 weeks after treatment was begun.

Since the child had never been outside Germany, vector transmission seemed highly improbable. The girl was born to a 26-year-old prima gravida, prima para, woman at 39 weeks' gestation by spontaneous labor; the infant's birth weight was 3,350 g, and she was 51 cm long. She showed normal development until the age of 8 months.

The mother had been healthy during pregnancy and had no history of serious disease; she did not show any pathologic findings at clinical investigation or in standard laboratory tests. However, *Leishmania* serologic tests conducted on blood samples from the mother showed positive results (IgG antibody titer 1:128 against promastigotes of *L. donovani*), and immunoblot analysis confirmed specific antibodies (Figure). During the last 15 years, she had spent holidays every year in Spain (Alicante) but had never been to a tropical country. She stayed in Spain during weeks 29–32 of her pregnancy. However, she could