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## Travel-related *Salmonella* Agama, Gabon

**To the Editor:** Traveler's diarrhea affects >50% of travelers to regions such as sub-Saharan Africa (1). Worldwide, enterotoxigenic *Escherichia coli* is the leading bacterial pathogen that causes traveler's diarrhea, followed by *Campylobacter jejuni* and then *Salmonella* spp., which are the causative pathogens for ≥25% of traveler's diarrhea in Africa (1). Nontyphoidal salmonellosis is mostly caused by the *Salmonella* serotypes Enteritidis and Typhimurium (2). To our knowledge, only a few cases of salmonellosis due to *S. Agama* have been reported in medical literature, none as a travel-related disease (3,4).

*S. Agama* was characterized in 1956 as a new serotype of *Salmonella enterica* from the feces of the agama lizard (*Agama agama*) in Nigeria (5). Subsequently, *S. Agama* was isolated from geckos and mammals in Africa (4,6,7) and the United Kingdom (8,9). Human infections with *S. Agama* were once reported in Nigeria and related to the lizards as possible reservoirs (4). Another clinical case of *S. Agama* infection was described in France in a 9-month-old child with fever and diarrhea (3); fruits imported from Africa were discussed

as potential source of infection. We report what is, to our knowledge, the first travel-related case of salmonellosis due to *Salmonella* Agama experienced by a tourist who had traveled to Gabon in central Africa.

A previously healthy 25-year-old man in Germany sought treatment for 2 episodes of intermittent fever ≤39°C, as well as headache, nausea, abdominal pain, diarrhea, arthralgia, and cough. Symptoms started the day he returned from a 1-month trip to Gabon, a country in central Africa, where he stayed with a friend who lives near the Albert Schweitzer Hospital in Lambaréné and took occasional excursions to other areas.

Before traveling, the patient had been immunized against hepatitis A, hepatitis B, yellow fever, polio, typhoid fever, tetanus, measles, and mumps; he reported taking atovaquone-proguanil for malaria prophylaxis during his first 3 weeks in Gabon. While in Gabon, he frequently drank tap water, ate food sold by street vendors, and had repeated fresh water contact while swimming in the Ogooué River. He exhibited no symptoms during his trip.

His first examination was performed 2 weeks after his return to Germany and the onset of symptoms. Physical examination showed no pathologic findings, malaria was excluded by repeated thick blood smears, and in the absence of abnormal laboratory findings a common cold disease was assumed on clinical grounds. No specific treatment was prescribed, and the patient recovered from symptoms except for intermittent mild diarrhea.

Four weeks after his return to Germany, a second episode with reappearance of all former symptoms led to a new examination. At this time, the patient was afebrile, and physical examination showed no pathologic findings. Laboratory values were within the normal range except for C-reactive protein, which was elevated at 47mg/dL (normal value <5 mg/dL). Pneu-

monia was excluded by radiography, and a stool sample was obtained for parasitologic examination and bacterial culture. The patient was treated with clarithromycin, 500 mg orally twice a day for 7 days, for a presumed upper respiratory tract infection. The patient's symptoms disappeared.

Stool sample test results were negative for intestinal helminths and other parasites. However, growth of *Salmonella* species was observed in 1 culture. The isolate was characterized as *Salmonella* Agama (*S. enterica* subspecies *enterica* serotype Agama 4,12:i:1,6). It was sensitive to ampicillin, cefotaxime, cefuroxime, ceftriaxone, imipenem, ciprofloxacin, gentamicin, trimethoprim-sulfamethoxazole, and fosfomycin but resistant to clarithromycin (MIC 96 mg/L). Five weeks after clinical resolution, further stool samples were found to be negative for any enteric pathogen.

In the light of the microbiologic evidence of *S. Agama* infection, we interviewed the patient about any consumption of meat or poultry and contact with animals. The patient reported no contact with animals during and after his trip to Gabon and said he is a vegetarian who abstains from consumption of any meat, including poultry. In Gabon, lizards are plentiful around all habitations, including the terrace of the house where the patient stayed; he reported that he ate sitting on the floor of the terrace. Lizards are also sometimes seen in food displays at street markets, including among foods that are commonly eaten uncooked (Figure).

Given microbiologic results and travel history, *S. Agama* was the most likely cause for the gastroenteritic and unspecific symptoms experienced by our patient. We may speculate about transmission of *S. Agama* by direct or indirect contact with lizards, but other routes of transmission cannot be ruled out.

Gastrointestinal and unspecific symptoms lasted 2 weeks with un-



Figure. Photograph taken at a local street market in Gabon shows a lizard in a basket of onions, which are frequently eaten uncooked. *Salmonella enterica* subspecies *enterica* serotype Agama has been isolated from lizards in Africa.

dulating severity and relapsed after a latent period of another 2 weeks. Although the isolate was highly resistant to clarithromycin *in vitro*, the patient improved clinically as symptoms disappeared. Results of stool cultures taken 5 weeks after resolution of clinical symptoms were negative. The clinical course of this patient's illness suggests that *S. Agama* may cause self-limiting infections and asymptomatic shedding, as do other nontyphoidal *Salmonella* infections. The course of disease may be affected by the ingested infective dose, host factors, and virulence of *S. Agama* isolates.

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## Small Anellovirus Infections in Korean Children

**To the Editor:** Recently, Jones et al. (1) identified circular DNA sequences, classified as *Anellovirus* genus, in plasma from patients with acute viral infection syndromes. These anelloviruses were then labeled as "small anellovirus (SAV)" because of their smaller genomes when compared with Torque Teno Virus (TTV) and Torque Teno Mini Virus (TTMV), which have small, circular, single-stranded DNA genomes. Although anelloviruses are not associated with any specific disease, TTV has been suggested to play a role in acute respiratory disease (ARD) and in asthma of children (2,3).

Kawasaki disease and Henoch-Schonlein purpura are important vasculitis disorders in children, possibly triggered by unknown infectious agents. Recently, Gergely et al. (4) reported that molecular mimicry involving TTV and the generation of autoantibodies may have a role in the pathogenesis of systemic lupus erythematosus. The purpose of our study was to investigate the prevalence of SAV and its association with various clinical diseases in children.

The study population comprised 81 serum samples from healthy children and 151 serum samples from children hospitalized with hepatitis (81 cases), ARD (40 cases), Kawasaki disease (12 cases), or Henoch-Schonlein purpura (18 cases) during the period January 2002–June 2006. Nasopharyngeal aspirates paired with serum samples were collected from 34 children with ARD, including upper respiratory tract infections, pneumonia, and acute bronchiolitis. Samples were collected after informed consent was obtained at admission from patients' parents.

PCRs for SAV were performed to amplify a 5' noncoding region of SAV