Salmonella bongori 48:z$_{35}$:– The first Italian case of human infection outside Sicily

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Summary

Salmonella bongori 48:z$_{35}$:– is considered endemic to Sicily (Italy) due to its epidemiological peculiarity. To our knowledge, no previous cases of human infection caused by *S. bongori* 48:z$_{35}$:– have ever been reported in mainland Italy. Here we describe the isolation of *S. bongori* 48:z$_{35}$:– from a 1-year-old symptomatic child in northwest Italy (Piedmont Region). The strain showed no antimicrobial resistance. Reporting of *S. bongori* 48:z$_{35}$:– in a previously safe area is important to identify epidemiological changes.

Introduction

Strains of *Salmonella bongori* with the antigenic formula 48:z$_{35}$:– have been isolated from various different sources in Sicily: 23 children (aged 1 month to 3 years), an HIV-positive patient, a healthy human carrier, foodstuffs (soft cheese and hen's eggs), pigeons, blackcaps, and urban sewerage plants. In the majority of the human cases, illness occurred in infants and toddlers, manifesting with moderate to severe diarrhea and fever. One instance of infection with *S. bongori* 48:z$_{35}$:– was reported in a dog with diarrhea in Calabria, Cosenza (southern Italy) in 1999. The apparently exclusive presence of *S. bongori* 48:z$_{35}$:– strains suggests that this serovar is endemically circulating in Sicily (2,4).

To our knowledge, no cases of human infection with *S. bongori* 48:z$_{35}$:– have ever been reported outside Sicily. Elsewhere, the only recorded isolates were the isolation from a lizard in Chad in 1966, reported as the first isolated strain, and isolates from foodstuffs in England and Turkey (1,4).

We report a recent case of infection with *S. bongori* 48:z$_{35}$:– in a 1-year-old child in northwest Italy.

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Case Report

In August 2014, a toddler was admitted to the Hospital of Alessandria (northwest Italy) because of severe haemorrhagic diarrhoea and fever. The remainder of the physical examination was unremarkable and hydration was normal. Bleeding punctate abrasions were seen on the perianal skin. Paracetamol was given. The child was hospitalised for 2 days and discharged after remission of symptoms. Treatment with ceftibuten for 4 days and probiotics for 10 days was prescribed. Blood and stool samples were sent to the hospital's microbiology laboratory for pathogen detection. *Salmonella* spp. strain was isolated and identified from the stool samples.

The strain was subsequently typed as *S. bongori* 48:z$_{35}$:– by the Regional Reference Laboratory for Salmonella typing according to the Kauffman-White and Le Minor scheme. *S. bongori* was confirmed by 16S rDNA sequencing using the MicroSEQ Full Gene system (Life Technologies). Antimicrobial resistance was verified by the disk diffusion method; the antibiotic used and their concentrations (g) were: nalidixic acid (NAL, 30), ampicillin (A, 10), cefotaxime (CTX, 5), ceftazidime (CAZ, 10), amoxicillin/clavulanic acid 2:1 (AMC, 30), meropenem (MEM, 10), chloramphenicol (C, 30), gentamicin (G, 10), kanamycin (K, 30), streptomycin (S, 10), sulfonamides (Su, 0.25), tetracycline (T, 30), trimethoprim (TMP, 5), and trimethoprim-sulfamethoxazole (SXT, 1.25/23.75). The reference strain *Escherichia coli* ATCC 25922 was used as a control for each experiment. EUCAST guidelines were applied for category interpretation of antibiotics, as

described by Garcìa-Fernàndez (3). The strain was fully susceptible against the tested antibiotics (Table 1).

Epidemiological investigation by telephone interview with the child's mother revealed that the child and his family had recently returned by ferry from Sardinia but yielded scant clues about possible sources or routes of infection. No previous contacts with birds or cold-blooded animals were reported. No clear link between the illness and the consumption of food or drink could be established. Infection might have occurred during the family's stay in Sardinia or while aboard the ferry.

Conclusions

The prevalence of *S. bongori* is reportedly low but persistent in southern Italy (4). Unfortunately, the epidemiological investigation failed to identify the source of infection in the present case, which a more detailed and accurate investigation might conceivably have resolved. Since the child's parents showed no symptoms, no biological samples were obtained for microbiological analysis. The hospital protocol does not provide for sampling asymptomatic family members when a child is admitted for gastroenteritis. However, because asymptomatic human carriers are a known source of infection, microbiological analysis of biological samples from the parents could have added useful information to solve this case (5). Furthermore, no samples of the food the child ate on the ferry were available for microbiological analysis, which, because food can be a vehicle for infection with *S. bongori* (1), could have aided in uncovering the source of infection.

Monitoring the spread of *S. bongori* 48:z_{35}:– is needed to collect more information about this serovar, which, until now, seemed to be confined to southern Italy. Reporting the isolation of a new pathogen in a previously safe area is the first step to identify epidemiological changes and plan surveillance programs.

Table 1. Antimicrobial susceptibility of *Salmonella bongori* 48:z_{35}:–

Antimicrobial	Concentration (μg)	Susceptibility
Nalidixic acid	30	Susceptible
Ampicillin	10	Susceptible
Cefotaxime	5	Susceptible
Caftazidime	10	Susceptible
Amoxicillin/clavulanic acid 2:1	30	Susceptible
Meropenem	10	Susceptible
Chloramphenicol	30	Susceptible
Gentamicin	10	Susceptible
Kanamycin	30	Susceptible
Streptomycin	10	Susceptible
Sulfonamides	0.25	Susceptible
Tetracycline	30	Susceptible
Trimethoprim	5	Susceptible
Trimethoprim-sulfamethoxazole	1.25/23.75	Susceptible

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