Unusual Occurrence of Salmonella Mikawasima in 2012–2013 in the Czech Republic: Part of a Multistate Outbreak?

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Abstract

An increased number of cases of salmonellosis caused by the rare serotype Mikawasima was noted in the years 2012 and 2013 in the Czech Republic. A potential on-going outbreak caused by this serotype in European countries has also been reported. Altogether 14 human and 1 environmental isolates from the year 2012 and 11 human isolates from the year 2013 from different locations of the Czech Republic were sent to our laboratory for typing. Macrorestriction analysis together with antimicrobial susceptibility testing and PCR for ESBL and plasmid-mediated quinolone resistance detection were performed to compare our isolates. Twenty-one isolates created two very similar clusters and 5 isolates had different profiles. Twenty-five isolates were fully susceptible to all agents used. One isolate showed resistance to 12 microbial agents and possessed bla\textsubscript{TEM}, bla\textsubscript{SHV}, bla\textsubscript{OXA}, bla\textsubscript{CTX-M} and qnr\textsubscript{B} genes.

Key words: Salmonella, β-lactam resistance, multistate outbreak, quinolone resistance
Twenty-five out of twenty-six isolates were susceptible to all tested antimicrobial agents. However, a human isolate from 2013 was discovered to be resistant to 12 agents (A/Ctx/C/S/K/Cn/Su/Sxt/W/Te/Na/Atm). This isolate carried genes \( \text{bla}_{\text{TEM}}, \text{bla}_{\text{OXA}}, \text{bla}_{\text{CTX-M}} \) and plasmid mediated \( \text{qnrB} \).

Altogether six rather similar macrorestriction profiles (almost 90% similarity) were detected (Fig. 1). Within the first major group (21 isolates) two subprofiles could be recognized (95% similarity), SMw-Xba-1 most typical for isolates from 2012 and SMw-Xba-1a most typical for isolates from 2013. There were five isolates with different profiles, two from 2012 (SMw-Xba-3, SMw-Xba-6) and three from 2013 (SMw-Xba-2, SMw-Xba-4, SMw-Xba-5). The environmental isolate from waste water shared the most common profile from 2012 (SMw-Xba-1). Most cases (37.5%) belonged to patients of the age group ≥ 65 years.

Czech isolates of the serotype Mikawasima from the years 2012 and 2013 showed great similarity apart from five human isolates. Moreover, our PFGE profiles matched profiles from other European countries (ECDC, 2013). Interestingly, the isolates with the outbreak profile were obtained in various and also distant areas of our country which also indicates the Czech Republic became a part of an outbreak of a greater extent. Unfortunately, no isolate of food origin was obtained. However, it is noteworthy that the majority of cases belonged to the adult age group. The isolate showing 12 antimicrobial agents resistance pattern and pulse profile SMw-Xba-2 isolated in 2013 from a long-term hospitalized elderly patient (83 years) without any travel history might have received a plasmid carrying resistance genes. Nevertheless, to confirm this hypothesis, a further examination is needed.

Apparently, there has been an on-going outbreak of salmonellosis in Europe caused by the rare serotype Mikawasima. It is important to find out how many countries have been affected and try to detect the source of the infection.
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Literature


