Beta-lactamases among Extended spectrum Beta-lactamase resistant (ESBL) Salmonella from poultry, poultry products and human patients in The Netherlands - DTU Orbit (28/09/2019)

Beta-lactamases among Extended spectrum Beta-lactamase resistant (ESBL) Salmonella from poultry, poultry products and human patients in The Netherlands

Objectives: The purpose of this work was to study the genetic determinants responsible for extended-spectrum beta-lactamase (ESBL) resistance of Salmonella isolated from Dutch poultry, poultry meat and hospitalized humans. Methods: Thirty-four ESBL-resistant Salmonella isolates from The Netherlands were tested towards 21 antimicrobial agents. PCR and sequencing were used to determine the underlying genetic determinants responsible for the ESBL phenotypes. The transferability of the ESBL phenotypes was tested by conjugation to a susceptible Salmonella enterica serovar Dublin and plasmid purification, restriction fragment length polymorphism (RFLP) and pulsed-field gel electrophoresis (PFGE) were employed to further characterize a subset of the isolates. Results: A great genetic diversity was seen among the isolates. The bla(TEM-52) gene was most predominant and was found among Salmonella enterica serovars Blockley, Thomson, London, Enteritidis phage type 14b, Paratyphi B, Virchow and Typhimurium phage types 11 and 507. We also found the bla(TEM-20) gene in S. Paratyphi B var. Java and the bla(TEM-63) gene in S. Isangi. Furthermore, we detected the bla(CTX-M-28) gene in S. Isangi and the bla(CTX-M-3) gene in S. Typhimurium phage type 507. The bla(CTX-M-2) gene was identified in S. Virchow, which also contained a copy of the bla(SHV-2) gene and a copy of the bla(TEM-1) gene. The bla(SHV-12) gene was found alone in S. Concord and together with the bla(TEM-52) gene in S. Typhimurium. Finally, the bla(ACC-1) gene was cloned from a S. Bareilly isolate and was found to be present on indistinguishable plasmids in all S. Bareilly isolates examined as well as in a S. Braenderup isolate and a S. Infantis isolate. Conclusions: Our data underscore the diversity of ESBL genes in Salmonella enterica isolated from animals, food products and human patients.

General information
Publication status: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Contributors: Hasman, H., Mevius, D., Veldman, K., Olesen, I., Aarestrup, F. M.
Pages: 115-121
Publication date: 2006
Peer-reviewed: Yes

Publication information
Journal: Journal of Antimicrobial Chemotherapy
Volume: 56
Issue number: 1
ISSN (Print): 0305-7453
Ratings:
Scopus rating (2006): SJR 1.771 SNIP 1.437
Web of Science (2006): Indexed yes
Original language: English
Source: orbit
Source ID: 237633
Research output: Contribution to journal » Journal article – Annual report year: 2006 » Research » peer-review