In vitro Antimicrobial Resistance of Causative Agents to Clinical Mastitis in Danish Dairy Cows - DTU Orbit (26/10/2019)

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This study was undertaken to investigate the antimicrobial resistance patterns of major causative agents to clinical mastitis in Danish dairy cows collected in 2016 to provide data on the current resistance patterns. Such data may subsequently serve as basis for a guideline for prudent use of antimicrobial agents in mastitis treatment. In addition, this study serves as a baseline for future comparison. The minimum inhibitory concentrations in Escherichia coli (n = 62), Klebsiella pneumoniae (n = 18), Staphylococcus aureus (n = 63), coagulase-negative Staphylococci (CNS) (n = 49), Streptococcus uberis (n = 61), Streptococcus dysgalactiae (n = 33), and Streptococcus agalactiae (n = 13) were determined to antimicrobial agents representing most classes relevant for treatment. The occurrence of resistance in the 299 bacterial isolates in total was evaluated using Clinical and Laboratory Standards Institute clinical breakpoints or in-house breakpoint values. For E. coli, low resistance levels were detected, 11.3% being resistant to ampicillin while resistance to other compounds was lower or zero. In contrast, K. pneumoniae revealed frequent ampicillin resistance (83.3%), but was susceptible to most other antimicrobial agents tested. Staphylococci were susceptible to the majority of antimicrobial agents tested, only 17.7% of the S. aureus isolates and 22.4% of the CNS being resistant to penicillin. Species distribution of the CNS isolates revealed that Staphylococcus simulans, Staphylococcus chromogenes, and Staphylococcus epidermidis were the most prevalent species. One S. aureus and one S. chromogenes isolate was found to be cefoxitin resistant and confirmed as methicillin resistant by polymerase chain reaction detection of the mecA gene, showing that methicillin resistance in staphylococci is present. All species of streptococci were susceptible to penicillin. No other critical resistance was found in any species, and resistance was in general low to all clinically relevant compounds. We emphasize the need for continuous surveillance of antibiotic resistance in major mastitis pathogens and the need for harmonization of methods and interpretations.

General information
Publication status: Published
Organisations: National Veterinary Institute, Bacteriology & Parasitology, National Food Institute, Videncenter for landbrug (SEGES), Technical University of Denmark
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Number of pages: 11
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Foodborne pathogens and disease
Volume: 16
Issue number: 8
ISSN (Print): 1535-3141
Ratings:
BFI (2019): BFI-level 1
Web of Science (2019): Indexed yes
Original language: English
Keywords: CNS, Enterobacteriaceae, MALDI-TOF, Staphylococci, Streptococci, antimicrobial susceptibility, bovine mastitis, methicillin-resistant, methicillin-resistant Staphylococcus aureus
DOIs:
10.1089/fpd.2018.2560
Source: FindIt
Source ID: 2446992148
Research output: Contribution to journal › Journal article – Annual report year: 2019 › Research › peer-review