Trends in antimicrobial susceptibility of salmonella recovered from cattle diagnostic samples in Ohio

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Introduction

Salmonella enterica is an important cause of illness and death in humans. There has been a great deal of efforts to reduce its impact; yet Salmonella infections continue to burden the health of U.S. consumers more than any other foodborne pathogen. Salmonellosis is also an important cause of disease in cattle, causing diarrhea, dehydration, depression, fever, decreased milk production, and anorexia. Surveillance for antimicrobial resistance within healthy food animal populations captures predominantly susceptible Salmonella serovars that are infrequent causes of human illness; however, data from cattle diagnostic submissions can be used to capture trends in antimicrobial susceptibility of strains with a higher public health relevance. Our objective was to evaluate trends in antimicrobial susceptibility of Salmonella recovered from diagnostic samples from clinically ill cattle submitted to the Ohio Department of Agriculture between 2006 and 2017.

Materials and Methods

Retrospective antimicrobial susceptibility and serovar data for Salmonella spp. recovered from bovine diagnostic specimens between January 2006 and mid-February 2017 were retrieved from the Ohio Department of Agriculture Animal Disease Diagnostic Laboratory. The data were analyzed to describe the distribution of serovars and resistance phenotypes and identify significant changes in the proportions of isolates non-susceptible to 10 different antimicrobials over time.

Results

The most common serovars recovered were Cerro (32.8%), Dublin (12.3%), Typhimurium (10.7%), and Newport (5.8%). Across all Salmonella serovars, the proportion of isolates non-susceptible significantly decreased for ampicillin, ceftiofur, tetracycline, florfenicol, and neomycin, but the proportion increased for enrofloxacin. Serovar Cerro isolates had the highest susceptibility, and serovar Dublin isolates had the lowest. Significant within-serovar changes in susceptibility were infrequent through the study period.

Significance

Levels of antimicrobial resistance significantly declined for Salmonella isolates recovered from clinically ill cattle in Ohio within the last 10 years. Changes were primarily due to shifts in the population of serotypes, rather than within-serotype changes.