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Title: North American Mycoplasma hyopneumoniae MICs

Introduction

Mycoplasma hyopneumoniae (M. hyopneumoniae) is recognized as the causative agent of enzootic pneumonia and is a primary contributor to the porcine respiratory disease complex (1). Information about M. hyopneumoniae antimicrobial susceptibility is largely limited, as this species is especially hard to culture and antibiograms are not routinely performed. Indeed, the most current publicly available data on antimicrobial susceptibility for M. hyopneumoniae isolates from the US is dated several decades (2). In this context, the aim of this study was to determine the in vitro susceptibility to different antibiotics of M. hyopneumoniae contemporary isolates originated from field clinical cases in the US.

Materials and Methods

Eleven M. hyopneumoniae isolates were obtained from US swine farm clinical specimens within the most recent six years. Minimum inhibitory concentration values (MICs) of the examined antibiotics against the isolates were determined by a microbroth dilution method (3). Briefly, 100 µL of the appropriate antimicrobial solution was distributed into the corresponding well of microtiter plates, with a final range of antimicrobials from 0.001 to 64 µg/mL. The test was accomplished on 104 CCU/mL of each isolate. All isolates were tested in three independent replicates. For each isolate and plate, two positive (growth) controls were included by adding 100 µL of sterile medium in the wells with no antimicrobial. For negative (uninoculated) controls, four wells were filled with 200 µL of sterile medium. M. hyopneumoniae 11 (ATCC 25095) was used as reference strain for the MIC tests. The range of MICs recorded as well as the concentrations of compounds to which 50% or 90% of the isolates were susceptible (MIC50 or MIC90) were reported.

Results and Discussion

In comparison to the ATCC 25095 reference strain MICs, the M. hyopneumoniae US isolate MIC50/90 values were higher for Enrofloxacin, Marbofloxacin, Tylvalosin, and Oxytetracycline. The highest MIC90 values for M. hyopneumoniae US isolates were found at ≤8 µg/mL for Tilmicosin and Oxytetracycline, whereas the lowest MIC90 value was obtained at ≤0.016 µg/mL for Tylvalosin. Overall, a high in vitro efficacy of the tested agents against M. hyopneumoniae contemporary isolates was observed. Results from this study represent a renewed step towards appropriate and accurate antibiotic treatment of M. hyopneumoniae-driven disease.

References

1. Pieters M & Maes D 2019. Diseases of Swine 56:863-883.
2. Williams PP 1978. Antimicrob Agents Chemother 14:210-213.
3. Klein UA et al. 2017. Vet Microbiol 204:188.