

Minimum Inhibitory Concentrations of Tylvalosin against Recent Field Strains of *Mycoplasma hyopneumoniae* Isolated from Four European Countries

Alfonso Lopez Rodriguez¹; Andrew Pridmore²; Hafid Benchaoui¹

¹ ECO Animal Health Ltd., London, ² Don Whitley Scientific, Bingley, West Yorkshire
E-mail: Alfonso.lopez@ecoanimalhealth.com

Introduction

Mycoplasma hyopneumoniae is a primary pathogen within the Porcine Respiratory Disease Complex (PRDC) which leads to health and welfare problems and poor performance. Even with multifaceted approaches to the prevention and control of PRDC on farm, including biosecurity and vaccination, treatment with antibiotics is often necessary. Although macrolides are generally highly effective against *M. hyopneumoniae*, sensitivity testing is helpful in selecting antibiotics and monitoring their efficacy. The objective of this study was to determine the Minimum Inhibitory Concentrations (MICs) of the macrolide tylvalosin (TVN), the active ingredient in Aivlosin[®] (ECO Animal Health Ltd), against recently isolated European strains of *M. hyopneumoniae*.

Materials and Methods

Test article (TVN) was tested for purity, dissolved in sterile deionized water and stored frozen prior to use. Multiple strains of *M. hyopneumoniae* were obtained from collections of recently isolated field strains from pigs with signs of respiratory disease: 10 from Spain (isolated from 2010-2011), 10 from Hungary (isolated 2015), 10 from Belgium (isolated 2015), and 10 from the UK (isolated 2016). In addition, the reference strain NCTC 10110 was used to monitor the performance of the tests. Prior to use, all strains were stored in cryoprotective suspension at -80°C. The test system used broth microdilution MIC methodology^{1,2} modified for suitability for *M. hyopneumoniae*³. Culture media were prepared using supplemented Friis medium adjusted to pH 7.6. Inoculated plates were incubated at 37°C. Sterile microtitre plates were prepared with serial doubling dilutions of test article in 100 µL aliquots of Friis medium to give a concentration range from 0.001 to 4 µg/mL. Each plate included wells acting as positive or negative controls. Wells were inoculated with 100 µL of broth containing approximately 1x10⁶ cfu per mL of each strain of *M. hyopneumoniae*. Plates were read at 24 h intervals and incubated for 4-18 days until all strains produced MIC results. The MIC range, MIC₅₀, and MIC₉₀ were calculated for each test article.

Results and Discussion

The results are presented in Table 1. The range of MICs for TVN against all strains of *M. hyopneumoniae* tested

(including the reference strain) was 0.008–0.031; these were within ±1 doubling dilution of the median which demonstrated the consistency of the test system. These results are comparable to those reported previously for TVN for isolates collected between 1997 and 2000 (MIC₉₀ of 0.06 µg/mL)⁴ and for those reported in 2014 (MIC₉₀ of 0.06 µg/mL)⁵, indicating that to date there has been no relevant change in susceptibility over time.

Table 1. MIC results for 40 European strains (10 per country) of *M. hyopneumoniae*.

	TVN MIC (µg/mL)		
	Range	MIC ₅₀	MIC ₉₀
Spain	0.016 – 0.031	0.016	0.031
Hungary	0.016 – 0.031	0.016	0.031
UK	0.008 - 0.031	0.016	0.031
Belgium	0.016 – 0.031	0.016	0.031
All	0.008 - 0.031	0.016	0.031

Conclusions

The susceptibility to TVN of these recently collected *M. hyopneumoniae* field strains from four European countries was consistently high. These data will be useful in the ongoing monitoring of Aivlosin[®] effectiveness for the management of PRDC in the field. The susceptibility to TVN established in this survey indicates no change over time when compared to previously generated MIC data.

References:

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