

Relationship Between Antibiotic Susceptibility of Mastitis Pathogens and Treatment Outcomes

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Introduction

The efficacy of mastitis therapy depends on inherent characteristics of the pathogen, the duration of therapy, host factors and the concentration of antibiotic that can be maintained at the site of infection. Susceptibility tests of mastitis pathogens are often used to guide treatment decisions, but the clinical relevancy of susceptibility testing has been challenged. The objective of this study was to determine the relationship between minimum inhibitory concentration (MIC) of mastitis pathogens and outcomes of clinical mastitis.

Materials and Methods

Duplicate quarter milk samples were obtained from cows observed with mild to moderate mastitis in a single quarter. Cows were ineligible if they had secondary clinical signs or had received antibiotics within the previous 30 days. Cows were treated with intramammary pirlimycin and could not receive ancillary treatments such as oxytocin or anti-inflammatories. Milk samples were collected before treatment and 14 and 21 days after treatment. Microbiological procedures were as described by the National Mastitis Council. MIC values were determined using a commercial microdilution method (Sensititre, Westlake, OH).

Results

Of eligible milk samples ($n = 217$), 58 samples were no growth, 17 produced different growth on the dupli-

cates and six were contaminated. MICs were obtained for: *Streptococcus* spp (34.6%), *Escherichia coli* (25.7%), CNS (19.1%), *Klebsiella* spp (9.6%) and other minor pathogens (14.0%). The mean days of treatment and days until clinical cure were 2.9 and 3.6 days, respectively. No significant difference was observed for days of treatment (2.8 and 2.9) and days until clinical cure (3.5 and 3.8) for gram-positive and gram-negative isolates, respectively ($P > 0.09$). No significant difference was observed for days of treatment (2.8 and 2.9) and days until clinical cure (3.4 and 3.8) for isolates that were susceptible or resistant to pirlimycin, respectively ($P > 0.9$). No significant difference in bacteriological cures were observed for gram-positive (40.9 and 50.7%) and gram-negative (50 and 50.9%) isolates at day 14 and 21, respectively ($P > 0.60$). No significant difference in bacteriological cures were observed at day 14 (41.2 and 47.8%) or day 21 (50.7 and 50.9%) for susceptible or resistant isolates, respectively ($P > 0.5$).

Significance

There was no association between farm and mean MIC for any antibiotic included in the mastitis susceptibility panel. This study did not identify an association between results of susceptibility testing and clinical outcomes of mastitis.