

The Effect of 'Blitz' Treatment of *Streptococcus agalactiae* with Ceftiofur Sodium on Bulk Tank Somatic Cell Count and Test-day Milk Yield in a Dairy Herd in Iran

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Introduction

Streptococcus agalactiae (*S. agalactiae*) continues to be one of the major causes of subclinical mastitis in dairy cows and a considerable source of economic loss for the industry, including Iranian dairy herds. High mammary tissue and milk concentrations of ceftiofur following intramammary administration have been previously demonstrated. The objective of this study was to determine the effect of ceftiofur sodium as a therapeutic for blitz treatment of *S. agalactiae* on bulk tank somatic cell count (BTSCC) and milk yield of infected cattle in a large dairy herd in Iran.

Materials and Methods

Based on the bulk tank somatic cell counts and bacteriological cultures, *S. agalactiae* was identified as the major cause of mastitis in a 300-cow dairy herd southeast of Tehran, in which dry cow therapy and post-milking teat dipping were improperly used. Composite milk samples were collected aseptically from 252 lactating cows. *S. agalactiae* was isolated from 77 (30.55%) samples. The infected cows received three intramammary infusions of 125 mg of ceftiofur sodium (Excenel®, Pharmacia Animal Health) in each quarter at 24-hour intervals. Afterwards, milk samples from 24 (31.17%) treated cows were randomized to be cultured on two occasions following treatment, and *S. agalactiae* was isolated from just three cows. Bulk tank milk samples were collected bi-monthly for a period of three months before the treatment and for a similar period

after that, in order to determine BTSCC and culture. BTSCC was measured using direct microscopic counting method, and microbiological procedures were conducted in accordance with National Mastitis Council (NMC) standards.

Results

Two-sample t-tests showed that the arithmetic mean of BTSCC after treatment (251,365 cells/ml) was significantly ($P<0.001$) lower, compared with that before treatment (610,521 cells/ml). Paired t-tests demonstrated that the average test-day production of treated cows five days after the treatment (26.45 kg; 58.2 lb) was significantly ($P<0.01$) higher than production before the treatment (55.4 lb; 25.19 kg). In addition, judging by the result of the Fisher's exact test there was a significant association between the blitz treatment and reduced detection of *S. agalactiae* from the bulk tank samples (from 85.71% of bi-monthly samples prior to the treatment to 14.28% after that; $P=0.014$). A positive correlation between BTSCC and bulk tank concentration of *S. agalactiae* also proved to be significant ($r = 0.537$, $P<0.05$).

Conclusions

We concluded that intramammary administration of ceftiofur at the dose used is efficacious as a treatment to decrease the prevalence of *S. agalactiae* in dairy herds, and could be used to reduce BTSCC and raise milk production in infected cows.