Relationship of Teat-end Hyperkeratosis to Incidence of Clinical Mastitis and Composite Milk Somatic Cell Count in a Large Holstein Dairy Herd with an Environmental Mastitis Problem

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Introduction

Several studies have demonstrated a positive association between teat-end hyperkeratosis (TEHK) and subclinical or clinical mastitis. Some studies found no positive correlation between them. To the knowledge of the authors, there is only one longitudinal study which demonstrated a negative association between teat-end callosity thickness and clinical Escherichia coli mastitis (Neijenhuis et al, 2001). The objective of this study was to determine whether TEHK is associated with an increased risk of clinical or subclinical mastitis in a large Holstein dairy herd in Tehran province of Iran, in which the monthly incidence rate of clinical mastitis was 9% prior to the beginning of the study.

Materials and Methods

Using a system of teat-end lesion classification (described by Neijenhuis et al, 2000), all teats (n=3332) were scored immediately after the clusters were removed. The degree of TEHK was determined using the scores N (normal) to VR (very rough). Teat-ends were classified as group 1: moderate-to-severely hyperkeratotic (scores R: rough or VR) or group 2: normal-to-slightly hyperkeratotic (score N or S: slight). The incidence rate of clinical mastitis (IRCM) was calculated in two groups within a month following the scoring. Composite milk somatic cell count (CMSCC) was measured using the fluoro-optoelectronic cell counting method (COMBIFOSS 5000, Fossomatic, Foss Electric, Denmark). During the study period, the farm’s personnel took randomly aseptic milk samples from a proportion of the clinically mastitic quarters. Microbiological procedures were conducted in accordance with National Mastitis Council (NMC) standards. Statistical analysis was performed using a Chi-squared test with 95% confidence interval (CI).

Results

Based on bacterial culture, E. coli was identified as the predominant cause of clinical mastitis. There is a significant difference between IRCM in group 1 (1.41%; 16 out of 1131 quarters) and group 2 (2.58%; 57 out of 2201) (P<0.05). Udder quarters with corresponding teat-ends from group 1 were at 0.54 times more risk of getting clinical mastitis, compared to quarters with corresponding teat-ends from group 2 during the study period (Relative risk=0.54, 95% CI: 0.33, 0.87). There is no significant difference between mean CMSCC in cows with at least one teat-end from group 1 (265,000 cells/ml) and those with four teat-ends of group 2 (343,000) (P>0.05).

Significance

The present study found a negative association between moderate-to-severe TEHK and IRCM in a herd with a predominantly E. coli mastitis problem, suggesting that the association between TEHK and clinical mastitis might be pathogen-specific. No relationship between TEHK and CMSCC was found at the test day.