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Longitudinal study of udder cleft dermatitis in 5 Dutch dairy cattle herds

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ABSTRACT

Udder cleft dermatitis (UCD) is a skin lesion in dairy cows, most often located between anterior parts of the udder and abdomen, but also found between the front quarters. A few recent studies have investigated the prevalence of UCD, but relatively little is known about its pathogenesis, clinical course, and duration. Therefore, the aim of this study was to investigate the incidence and recovery of UCD on high-prevalence herds. Five Dutch dairy herds with a UCD prevalence of at least 6% were visited weekly for 19 wk, followed by visits every other week for 26 wk. During each visit, all dry and lactating cows were inspected for the presence of UCD signs. If a UCD case was detected, the affected skin was photographed and the photo was subsequently examined by a research assistant. Cows were then classified according to the appearance of the skin into 3 categories: healthy (no photo: no signs), mild (photo: affected skin but no wound), or severe (photo: open wound). The overall mean within-herd prevalence of UCD was 38% and the overall mean incidence was 1.94 UCD episodes per 100 cow-weeks at risk. Incidence of UCD was significantly higher in cows in third or higher parity and significantly increased with DIM. Median observed duration of UCD was 16 wk. The UCD recovery was 3 times more likely for mild than for severe lesions. The probability to move from one category to another between 2 consecutive visits was very low, indicating that rapid changes in appearance did not occur. The observed incidence of UCD was rather low, and the relatively high prevalence in the selected herds was most likely due to the long duration of lesions rather than a high incidence of new UCD cases.

Key words: udder cleft dermatitis, incidence, longitudinal study, dairy cow

INTRODUCTION

In recent years, severe skin lesions around the anterior parts of the udder of dairy cows have been reported. The lesions, known as udder cleft dermatitis, **UCD** (Beattie and Taylor, 2000; Warnick et al., 2002; Olde Riekerink et al., 2014; Persson Waller et al., 2014), are mainly located between anterior parts of the udder and abdomen, but also found between the 2 front quarters. The lesions may vary in (clinical) appearance and size, but are usually characterized by a variety of the following signs: erythema, sebum, transudate, crusts, and thickened skin. In more severe cases, signs of necrosis of the skin and open wounds can be found, but signs of general disease are hardly seen (Persson Waller et al., 2014). In the worst cases, UCD can result in death caused by laceration of the mammary vein.

Reports of UCD cases are scarce, and not much is known about its etiology, clinical course, or duration. A few studies on UCD provide data on the prevalence of UCD in a specific problem herd (Beattie and Taylor, 2000; Warnick et al., 2002; Evans et al., 2010). More recently, studies have been carried out on randomly selected herds that included multiple herds (Olde Riekerink et al., 2014; Persson Waller et al., 2014). The prevalence in these latter studies varied from 0 to 39% affected cows per herd at any particular moment. Several risk factors, such as milk production level and the occurrence of mastitis or digital dermatitis, have been suggested to be associated with UCD (Boyer and Singleton, 1998; Stamm et al., 2009; Persson Waller et al., 2014), but a causal mechanism has not yet been identified.

Cross-sectional prevalence studies provide a snapshot of the situation at one time point but do not take into account the course of the condition in individual cows or within the herd. Therefore, the aims of this longitudinal study were to determine the incidence and duration of UCD in high-prevalence Dutch dairy herds and to identify possible cow-level risk factors.

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MATERIALS AND METHODS

A longitudinal study was performed from January 23 to December 9, 2013, on 5 Dutch dairy farms in the middle of the Netherlands. Farms were visited weekly or every other week, and during every herd visit all cows present were inspected for signs of UCD.

Selection of Herds

Five dairy herds were selected from the University Large Animal Practice (ULP) at Harmelen, the Netherlands, to participate. The housing system was comparable, and cows were housed in freestalls with concrete slatted floors. One herd used an automatic milking system, and the other 4 used a herringbone parlor. Bedding material in the boxes varied (Table 1). Study size was limited by expected weekly cow inspection on a fixed day every week and by financial restraints. The main criterion on which herds were selected was a UCD prevalence of at least 6%, to ensure sufficient cases. Other herd inclusion criteria were a milk production level of >7,500 kg of milk/cow-year, participation in a milk recording system every 4 to 6 wk, and a herd size of approximately 60 to 100 cows. The latter criterion was chosen for practical reasons, as all cows present had to be inspected every herd visit. In addition, this reflected the 2013 average Dutch herd size of 82 cows. Veterinarians from ULP provided information to identify herds with cows suffering from UCD. Of the 335 farms serviced by ULP veterinarians, 12 herds were identified for potential inclusion based on UCD information. Six herds did not meet the criteria because prevalence was too low and one farmer did not agree with the research protocol, with the remaining 5 herds included in the study.

Farmers consented to refrain from any treatment of UCD affected cows. This observational study was approved by the Ethical Committee of Utrecht University, and was not deemed an animal experiment under the Dutch Law.

Collection of Data

Herds were visited weekly between January 23 and June 7, 2013, on a fixed weekday, and every 2 wk from then on until December 9, 2013. Visit frequency was decreased because neither clinical appearance nor occurrence of cases changed rapidly. During the final 2 visits of the study period, only UCD-affected animals were followed up for potential recovery; no new cases were included.

On the day of the visit, following morning milking, all lactating and dry cows were fixed into headlocks and visually inspected one by one. Inspection of the animals was always carried out by the same research technician, whereas assistance could vary during the visits. The research technician used a lamp and hand mirror in one hand and spread the front quarters of the udder with the other hand for proper inspection of the skin between the 2 front quarters and skin of the anterior junction between the udder and the abdominal wall. Signs indicative for UCD were presence of crusts, transudate, sebum, erythema, granulation tissue, scar tissue, or an open wound. If a UCD case was observed, front quarters were spread by hand by one person and the research technician made a ventral photo of the lesions using a stick to which a mirror and camera were attached. Photos of the UCD lesions were taken via the mirror. Cow identification cards were clipped on a folding ruler and were photographed together with the lesion. When no signs indicative for UCD were observed, the udder of the cow was not photographed and therefore the cow was not recorded.

Interpretation of Photos

Initially, photos were evaluated using the scoring system by Olde Riekerink et al., (2014), in which individual signs were scored and the scores combined. However, when we checked the repeatability of this scoring system by submitting 15 photos to be examined by 5 ULP veterinarians, we found that their scores varied consid-

Table 1. Characteristics of the 5 Dutch dairy herds included in the longitudinal udder cleft dermatitis (UCD) study and number of UCD episodes observed per herd

Herd	Herd size (no. of cows)	305-d milk production (kg)	Bedding material in cubicle	Type of milking parlor	Pasturing in summer	UCD episodes, ¹ n = 289
1	56	9,151	None	2 × 5 parallel herringbone	Yes	45
2	79	9,163	Straw	2 × 6 herringbone	No	59
3	66	10,378	Sawdust	2 × 5 herringbone	Yes	50
4	89	8,648	Sawdust	2 × 6 herringbone	Yes	66
5	91	9,252	Straw	Automatic milking system	No	69

¹UCD episode = at least 2 consecutive UCD observations regardless of the visiting interval.

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