CASE REPORT

Haemophilus somnus Mastitis in a Dairy Cow

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Abstract

A clinical case of peracute bovine mastitis is described in which the most severely affected quarter yielded a heavy growth of *Haemophilus somnus* on culture.

Key words: *Haemophilus somnus*, bovine mastitis.

Résumé

Mammite due à *Haemophilus somnus*, chez une vache laitière

Les auteurs rapportent un cas de mammite bovine suraiguë, dans lequel le lait du quartier le plus gravement touché contenait une flore luxuriante de la bactérie *Haemophilus somnus*.

Mots clés: *Haemophilus somnus*, mammite bovine.

Introduction

Haemophilus somnus infection of cattle usually occurs as a septicemia followed by localization in a variety of organs causing meningoencephalitis, synovitis, pleuritis and pneumonia (1,2,3). It is a common cause of these diseases in feedlots in eastern and western Canada (4,5). It has been associated with abortion, endometritis and more recently otitis (6,7,8).

The experimental production of bovine mastitis with this organism has been described (9). The purpose of this report is to describe a clinical case of bovine mastitis in which *Haemophilus somnus* was cultured from the milk of an affected quarter.

History

At approximately 2000 h, on January 7, 1984 (Day 1) the Western College of Veterinary Medicine Field Service unit received a farm call for a cow that at the evening milking was producing bloody milk in one quarter and running a high fever. The animal was a two year old purebred Holstein cow grading good-plus which had been transported from Ontario with five others two weeks previously. She had calved, with some assistance, three days previously.

Clinical Findings and Treatment

The cow appeared somewhat depressed but was in good bodily condition. The vital signs were temperature (T) 42° C, heart rate (HR) 88/minute, respiratory rate (RR) 32/minute. All quarters were enlarged, swollen and firm but the left hind was markedly enlarged, very firm, and warmer on palpation than the other three. The secretion from this quarter was watery and markedly blood tinged with small fibrin clots. The right hind quarter secretion was also blood tinged, and some fibrinous clots were noticed in the secretion from the left front quarter. No other clinical abnormalities were found and a diagnosis of peracute mastitis, probably due to *Escherichia coli* was made. Milk samples for culture and a blood sample for a complete blood count (CBC) were taken.

The cow was treated intravenously with 2.4 g of trimethoprim and 12 g of sulfadoxine (Trivetrin injection — Coopers Agropharm, Willowdale, Ontario). Also given intravenously was 30 IU of oxytocin (Oxytocin — rogar/STB, Pointe Claire-Dorval, Quebec) after which the cow was completely milked out. The farmer was advised to strip all four quarters, especially the left side quarters, each hour until midnight, then infuse each of the affected quarters with one tube containing chloramphenicol 200 mg, dapsone 5 g and hyaluronidase 125 IU (Chlorosulfone — rogar/STB, Pointe Claire-Dorval, Quebec) after the last stripping. The farmer was told the mastitis was in an early stage and the condition would probably worsen by morning so she should be seen again at this time.

The cow was revisited the next morning, January 8 (Day 2) at approximately 0930 h. She was doing better than expected, her demeanour was brighter than the evening before and vital signs were T 39.8°C, HR 84, RR 36. The left hind quarter was still very swollen and firm but the colour of the secretion had changed to a straw colour with small clots. The rumen was considered hypomotile on auscultation.

The clinical diagnosis of coliform mastitis was maintained and the previous treatment was repeated. For follow-up therapy the farmer was instructed to give the cow 25 mL Trivetrin intramuscularly twice daily and to continue stripping and infusing as above for two more days.

The CBC results from samples taken the previous day revealed a marked leukopenia (WBC 2.3 x 10^9/L). A differential count was not possible due to very low numbers of cells, but cells present were predominantly lymphocytes with toxic band neutrophils. The interpretation was a severe neutropenia with degenerative left shift and this was considered to be consistent with the clinical diagnosis of *Escherichia coli* mastitis.

Three days after the initial visit (January 10) the cow was revisited. She had continued to improve and was eating well (T 38.9, HR 88, RR 20). The milk from the left hind quarter

appeared more normal and that from the left front quarter now appeared normal although both were 3+ on the California Mastitis Test. There was still obvious swelling in the left hind quarter and some generalized udder edema present.

In addition to the treatment described for the mastitis, routine treatment with oral boluses of trichoramethiazide and dexamethasone (Naquasone — Schering, 3535 Trans Canada, Pointe Claire, Quebec) for udder edema was included as well.

Bacteriology

Samples of milk for culture had been taken from all quarters. The left hind quarter yielded a heavy pure growth of *Haemophilus somnus*. This organism gave a luxuriant growth on cysteine heart agar containing 5% bovine blood incubated in 5% CO_2, was cytochrome oxidase positive and produced hydrogen sulphide, detected by lead acetate strips, when grown on triple sugar iron. It reduced nitrate and when grown in an atmosphere of CO_2 in media containing yeast extract and bovine serum produced acid in dextrose and maltose but not in lactose or sucrose. Pathogens were not isolated from the other quarters.

Case Follow Up

The cow survived the attack of peracute *H. somnus* mastitis but continued to have chronic mastitis in the left hind quarter. Her milk production was much lower than expected and she was dried off after five months of lactation. At this time, she was treated with 500 mg of benzathine cloxacillin (Orbenin Dry Cow — Ayerst, 1025 Boulevard Laurentian, St. Laurent, Quebec) infused into each quarter. Because of the genetic value of the cow, she was maintained in the herd. She was bred in April but aborted twin bull calves on October 13. At this time she gave very little milk and still had mastitis in the left hind quarter so she was rapidly dried off and shipped for slaughter three months later. It is unfortunate but due to circumstances beyond our control the cow was not subsequently cultured or the udder retrieved for a pathological diagnosis at slaughter. Other clinical manifestations of *H. somnus* did not occur in the herd.

Discussion

A recent study by Hazlett shows that experimentally, *H. somnus* is capable of causing two clinical forms of mastitis, a subacute mastitis and a very severe gangrenous mastitis (9). These authors are very suspicious that *H. somnus* may be involved in bovine mastitis and cite a spontaneous subacute case in a cow in Switzerland. They also refer to the close relationship of *H. somnus* to *Histophilus ovis* which causes mastitis in sheep (10).

The subject of this report had been exposed to severe stress during the previous two weeks: had been shipped about 2300 kilometres in winter weather; added to a 60 cow herd in a free-stall barn; and she had calved shortly after arrival. Outbreaks of infectious thromboembolic meningoencephalitis in beef calves are consistently associated with the stress of weaning, confinement or extreme cold weather (1). This case would appear to parallel that situation. The question remains whether the heifer was exposed to *H. somnus* upon arrival in the Saskatchewan herd or whether she was exposed in Ontario. Although most of the Canadian literature on *H. somnus* pertains to beef cattle, a recent study on dairy cattle in Quebec reveals an average seroreactor rate of 55.4% (range 27.9% to 94.8%) and a mean $\log_2$ titer of 4.1620 on 231 dairy herds in twelve areas of the province (11,12). The author states that the percentage of seroreactor animals in large dairy herds is the same as in feedlots in his study. We believe a significant number of Canadian dairy cows, whether in Saskatchewan or Ontario, have been exposed to *H. somnus*. We cannot say whether the infection occurred in one location or the other in the cow described here.

In view of the hemorrhagic nature of the secretion from the left hind and two other quarters it is possible that the true condition was thromboembolic with resultant ruptured small vessels rather than a simple mastitis characterized by ascending infection.

This report describes a case of spontaneous acute mastitis in a dairy cow caused by *H. somnus*. This bacterium should be included when listing the causes of bovine mastitis. Additionally, mastitis should be added to the list of clinical diseases caused by *Haemophilus somnus*.

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