

Acute Interstitial Pneumonia in Nongrazing Cows^[1] (Merada Otlamayan İneklerde Akut İntersitisyel Pnömoni)

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^[1] This study was previously presented at 1st International Farm Animal Medicine Congress, 14-17 April 2019, Fethiye, Mugla, Turkey and 13rd National-2nd International Veterinary Internal Medicine Congress, 11-13 October 2019, Ankara, Turkey

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Dear Editor,

Acute interstitial pneumonia (AIP) (also known as atypical interstitial pneumonia, acute bovine pulmonary edema and emphysema, fog fever) is an uncommonly observed disease of feedlot cattle caused by the ruminal conversion of tryptophan to 3-methylindole after grazing at lush tryptophan-rich pasture^[1-3]. This letter aims to describe cases of AIP observed in nongrazing lactating Holstein cows and to draw attention to this disease. Owner consent has been obtained for reporting the cases.

Atypical pneumonia was observed in 10 (aged between 3-8 years old) of 74 cows in early lactation over a period of 20 days in a herd of 162 cows. Increased respiratory rate (R=36-60/min), laboured and open-mouth breathing, and frothing around the mouth were seen in affected animals (Fig. 1). Clinical signs were mild in one and moderate-severe in other animals. Fever (T=38.8-39.7°C) or coughing was not present. Animals also demonstrated reluctance to walk and slow movements. Other cows in the early lactation period had decreased milk yields.

Pneumonia treatment was initiated with ceftiofur sodium (1.1 mg/kg, im, once per day, Seftivet®, Deva Holding AS, Istanbul, Turkey), but no improvement was observed. Serum samples obtained from affected animals revealed IBR positivity in one, and BVD, BRSV and PI3 seropositivity in another animal. Necropsy of the first dead cow revealed noncollapsing lungs bearing impressions of costae and widespread emphysema (Fig. 2). Inconsistency of clinical signs with infection, ineffectiveness of antibiotics and observation of severe emphysema at necropsy suggested



Fig 1. Frothing around the mouth and open-mouth breathing in a cow with acute interstitial pneumonia

AIP. Detailed questioning revealed that the animals had been consuming 5 kg of alfalfa hay and in the last 1.5 months additionally 3 kg alfalfa silage daily. Feeding with silage was ceased immediately and treatment for AIP was started with dexamethasone (0.05 mg/kg, im, single dose, Devamed®, Topkim, Istanbul, Turkey) in addition to antibiotics. Clinical signs did not improve except for one animal with mild clinical signs and 9 of the 10 animals died within 2-5 days. Severe emphysema of the lungs was evident at necropsy of all dead animals.

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Fig 2. Emphysema in the lungs of the same cow at necropsy

Cessation of silage resulted in increased milk yield in cows at early lactation and no new cases were observed after 10 days. Alfalfa hay and alfalfa silage samples were analyzed with HPLC-FLD and tryptophan levels were measured as 225 mg/100 g (11.25 g from 5 kg) ve 153 mg/100 g (4.60 g from 3 kg), respectively. Animals were also being fed 22 kg corn silage (containing 3.7 g tryptophan), 12 kg concentrate feed (containing 27.3 g tryptophan), and 2 kg wheat bran (containing 4.9 g tryptophan) which summed up to ingestion of a total of 51.75 g tryptophan daily (personal communication with Dr. Hidir Gencoglu, DVM, on 26th July, 2021).

The cows in the early lactation had a milk yield of 35-40 l/day entailing a daily tryptophan intake of 35-40 g according to the CNCPS model (CNCPS for Cattle, version 6.5.5, Cornell University, Ithaca, NY, USA). The figures revealed that the affected animals had been receiving 11-16 g/day excessive tryptophan in the last 1.5 months.

AIP, a disease of cattle mainly grazing at lush pasture in the northern hemisphere countries, can also occasionally occur due to housing in moldy barns, or exposure to pollens or irritating gases or fumes^[4]. Animals in our cases were housed in semi-open barns and, thus, were not exposed to molds or noxious smokes. AIP has been reported to occur particularly in cattle > than 2-years-old and 4-15 days after introduction to lush pasture. In our case, affected animals were 3-8 years old, were housed in semi-open barns, and the disease occurred after feeding with alfalfa silage. All affected animals were among the cows in the early lactation period, which were fed alfalfa silage and higher amounts of carbohydrates to prevent negative energy balance. Tryptophan, particularly from lush plants, is quickly converted by *Lactobacillus* spp. in rumen to 3-methylindole, the major metabolite causing the disease and consumption of high amounts of carbohydrates increases the number of *Lactobacillus* spp. and, thus, is a contributing factor to the occurrence of the disease⁽⁴⁾.

As a conclusion we would like to emphasize the importance of considering non-infectious etiologies in the differential diagnosis of pneumonia and that AIP may also occur in cows with no access to lush pastures. Levels of tryptophan should be taken into consideration when feeding roughage to lactating cows.

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