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Coronavirus as Agent of Neonatal Calf Diarrhea in Southern Chile*

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With one figure

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Summary

Neonatal calf diarrhea is one of the most serious problems of cattle industry all over the world. Although the aetiology is complex, it is possible to assess that viruses play a very important role.

During an investigation to study the importance of Rotavirus in enteric problems in calves and piglets, it was possible to demonstrate the presence, for the first time in southern Chile, of Coronavirus-like particles in a faecal sample of a 15 days old calf by means of electron microscopy.

The importance of this diagnosis and some clinical characteristics of the disease are briefly discussed. Finally, the need for more research on this complex subject is recognized.

Key words: Neonatal diarrhea, viral infection, calf

Introduction

As the systems of calf breeding have intensified, a marked increase in neonatal diarrhea has been observed. The economic losses are high and mainly due to a deficient growth of the affected animals, a high mortality on some farms and the expense of the required treatment.

The aetiology of neonatal diarrhea is diverse. Besides infectious agents, other exogenous and endogenous factors participate in the genesis of the disease, such as unbalanced feeding, poor conditions, housing, temperature, transportation and overcrowding (2).

Infectious agents of neonatal diarrhea include bacteria, fungi, viruses and parasites which can act separately or, as often is the case, in a combined form (7, 13).

Among the viral agents of importance described have been: Bovine Viral Diarrhea (BVD) virus, Enterovirus, Parvovirus, Adenovirus, Rotavirus, Coronavirus and Astrovirus (2, 3, 7, 12).

In Chile, the participation of Rotavirus (1) and BVD (10) in diarrheic problems has been reported.

The present communication reports, for the first time in Southern Chile, the participation of Coronavirus as an aetiological agent of neonatal calf diarrhea.

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Material and Methods

Faecal samples were collected from sick calves for a 10 months period, in order to study the importance of Rotavirus in neonatal diarrhea (9).

A total of 146 samples were processed for electron microscopy according to the technique of England et al. (5), using a Philips EM 100.

Results

From the total samples analysed by electron microscopy, one showed several viral particles resembling Coronavirus, with a typical configuration for that type of agent, as can be seen in Fig. 1. The positive sample was from a 15-days-old calf from a farm in the province of Valdivia.

Discussion

Coronavirus was isolated, for the first time in calf diarrhea in 1971 (8), calves being susceptible up to two months of age. However, most affected calves ranged in age from 4 days to 3 weeks (3). The presence of this virus has been shown in different parts in the world (4, 6, 11, 14).

The incubation period of this disease is approximately 20h, followed by a watery yellowish diarrhea which is accompanied by extreme weakness (2).

Studies carried out in other countries have shown that Coronavirus plays an important role in neonatal diarrheas; thus in Belgium, according to electron microscopy studies, 19.9% of the cases in calves are due to this agent (15). Similarly in West Germany, using the same methodology, 22% of positives were due to Coronavirus (3).

The finding reported here, found while searching for another causal agent, reaffirm in Chile that the aetiology of neonatal diarrhea is diverse, as seen in other countries and is a serious national and merits urgently further investigation problem.

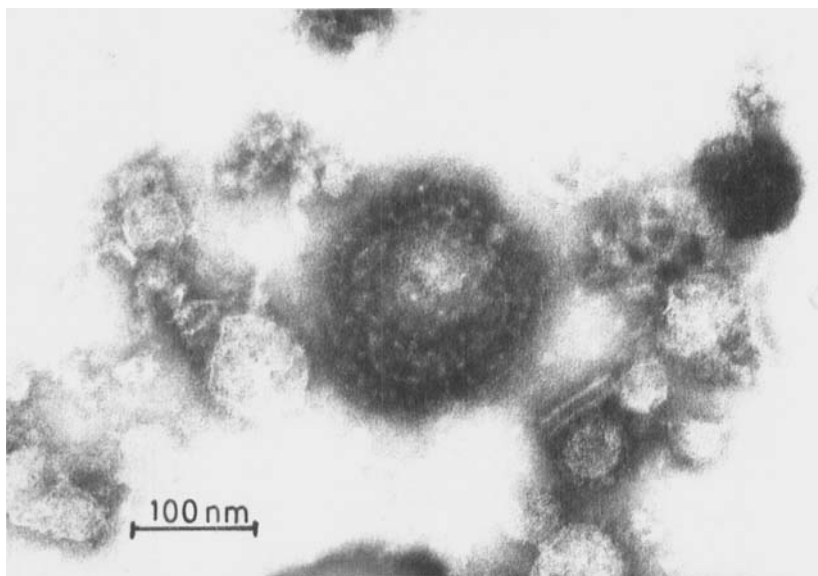


Fig. 1. Electron photomicrograph of a Coronavirus-like particles. Note the hexagonal structure, envelope and typical projections

Zusammenfassung

Coronavirus als Erreger von neonatalem Kälberdurchfall in Südchile

Neonataler Kälberdurchfall gilt weltweit als schwerwiegendes Problem in der Rinderzucht. Obwohl die Ätiologie komplex ist, ist bekannt, daß Viren hier eine sehr wichtige Rolle spielen.

Bei einer Untersuchung, die die Bedeutung von Rotavirus bei enteritischen Erkrankungen von Kälbern und Ferkeln erforschen sollte, wurden in Südchile zum ersten Mal mittels Elektronenmikroskopie Coronavirus-ähnliche Partikel in einer Kotprobe (gewonnen von einem Kalb 15 Tage nach der Geburt) nachgewiesen.

Die Bedeutung dieser Diagnose und einiger klinischen Eigenschaften der Krankheit werden kurz beschrieben. Schließlich wird auch anerkannt, daß in diesem schwierigen Gebiet noch mehr Forschungsarbeit nötig ist.

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