



A prospective study of the effect of *Neospora caninum* and BVDV infections on bovine abortions in a dairy herd in Arequipa, Peru

K. Ståhl^{a,*}, C. Björkman^b, U. Emanuelson^b,
H. Rivera^c, A. Zelada^d, J. Moreno-López^a

^a Department of Biomedical Sciences and Veterinary Public Health, Section of Parasitology and Virology, SLU, Uppsala, Sweden

^b Department of Clinical Sciences, SLU, Uppsala, Sweden

^c Laboratorio de Virología, Facultad de Medicina Veterinaria, UNMSM, Lima, Peru

^d Majes, Arequipa, Peru

Received 20 June 2005; received in revised form 18 January 2006; accepted 21 February 2006

Abstract

We used a prospective seroepidemiological approach to investigate endemic abortion in a dairy herd in Arequipa, Peru, and its association with *Neospora caninum* and bovine viral diarrhoea virus (BVDV) infections. Between January 2002 and March 2004, 1094 pregnancies were confirmed in 538 cows. Of these, 137 pregnancies (13%) in 121 cows ended in abortion. The serological status to *N. caninum* was assessed using a single serological screening, whereas BVDV status was assessed at the herd level through consecutive samplings of young stock.

Cox proportional-hazards models were used to estimate the effect of *N. caninum* and BVDV on the hazard of early (between day 42 and day 100 in gestation), and late (after day 100) abortions, respectively. Serological status to *N. caninum* was included as a dichotomous variable, and the effect of BVDV estimated at the herd level, as a time-dependent seasonal effect. Because data from repeated pregnancies were included, we considered possible lack of independence between observations and included frailty effects into the models. Our models also considered the possible confounding by parity and animal origin.

* Corresponding author. Tel.: +46 18674628; fax: +46 18674669.
E-mail address: Karl.Stahl@bvf.slu.se (K. Ståhl).

Only multiparity was associated with the hazard of early abortion (HR = 2.8 compared to nulliparous heifers). *N. caninum* seropositivity significantly affected the hazard of late abortion, but interacted with parity. The HRs for Neospora-positive animals were 6.4, 3.7 and 1.9, respectively, for nulliparous heifers, first-lactation cows and multiparous cows. Evidence of BVDV circulating (or not) among the young stock was not associated with abortions, but few cows in this herd were susceptible to incident infection.

© 2006 Elsevier B.V. All rights reserved.

Keywords: *Neospora caninum*; BVDV; Abortions; Peru; Cox proportional-hazard

1. Introduction

Neospora caninum is a major cause of bovine abortions, and both chronically and acutely infected cattle run an increased risk of aborting (for review see: Anderson et al., 2000; Dubey, 2003). Abortions associated with the infection occur from month 3 of gestation to term with a peak in incidence during months 4–6. Whether *N. caninum* infection also causes foetal loss in the earlier stages of gestation is less clear. The main transmission route in cattle is vertical, i.e. transplacental infection from cow to calf during gestation, and infected calves remain persistently infected and can pass the infection to their offspring (Björkman et al., 1996). Postnatal transmission also occurs (Thurmond et al., 1997; McAllister et al., 2000; Dijkstra et al., 2002b), apparently through ingestion of oocytes excreted by a definitive host (De Marez et al., 1999; Dijkstra et al., 2002a).

Bovine viral-diarrhoea virus (BVDV), endemic in most cattle-raising countries, also causes reproductive failure. Infections during pregnancy can result in embryonic death, abortions, birth of stillborn or weak calves, or can lead to birth of persistently infected (PI) calves that will shed virus throughout their lifetime (for review see Grooms, 2004). BVDV is immunosuppressive, which might increase susceptibility to other infectious agents (Elvander et al., 1998).

Abortion due to *N. caninum* is the result of transplacental transmission of the infection to the foetus after a maternal parasitemia. The mechanism for reactivation of latent *N. caninum* infections and what decides the outcome of pregnancy in an infected cow is still unknown (Innes et al., 2002). Immunosuppressive events during pregnancy have been suggested and the role of immunosuppression by concurrent infection has been addressed (Dubey, 2003). Björkman et al. (2000) reported an association between *N. caninum* and BVDV seropositivity and abortions, but results from other studies are contradictory (Bartels et al., 1999; Davison et al., 1999b; Mainar-Jaime et al., 2001). These previous studies have used case–control approaches to relate abortions with *N. caninum* and BVDV seropositivity in individual animals. Thus, they have not been able to discriminate between animals with active BVDV infection, vaccinated animals or previously exposed animals. So far, to our knowledge, no one has reported a study of the effect of an active BVDV infection on *N. caninum*-associated abortions.

We used a prospective seroepidemiological approach to investigate endemic abortion in a dairy herd in Arequipa, Peru, and its association with *N. caninum* infections in a herd with active BVDV infection.

Download English Version:

<https://daneshyari.com/en/article/2453710>

Download Persian Version:

<https://daneshyari.com/article/2453710>

[Daneshyari.com](https://daneshyari.com)