

SHORT COMMUNICATION

EVIDENCE OF *Neospora caninum* IN BEEF CATTLE AND DOGS IN THE STATE OF MATO GROSSO DO SUL, CENTER-WESTERN REGION, BRAZIL

RENATO ANDREOTTI¹; RHONDA D. PINCKNEY²; PEDRO P. PIRES¹; ELAINE A. E SILVA³

ABSTRACT: ANDREOTTI, R.; PINCKNEY, R.D.; PIRES, P.P.; SILVA, E.A. Evidence of *Neospora caninum* in beef cattle and dogs in the state of Mato Grosso do Sul, Center-Western Region, Brazil. [**Evidência de *Neospora caninum* em gado de corte e em cães no estado de Mato Grosso do Sul, região centro-oeste, Brasil.**] *Revista Brasileira de Parasitologia Veterinária* v. 13, n. 3, p. 129-131, 2004. Embrapa Gado de Corte, km 4 da BR 262, Caixa Postal 154, Campo Grande, MS 79002-970, Brazil. E-mail: andreott@cnpqc.embrapa.br

Neospora caninum has a worldwide distribution and is considered an important cause of bovine abortion. Sera from beef cattle from an upland region (Campo Grande) and a wetland one (Pantanal) and from dogs from the upland region (Campo Grande) were evaluated for the presence of *N. caninum* antibodies. Indirect fluorescent antibody test was used to detect antibodies in dogs and a commercial ELISA assay in bovines. In the upland region, the numbers of positive sera of *N. caninum* were 5.58 times as high in cows with an abortion history (43%) as in cows without it (7.7%). In the wetland region, 30% of the heifers evaluated were seropositive. Thirty percent of all dogs evaluated were seropositive. Preliminary data suggest that the evidence of abortion is related to a higher *N. caninum* serology in bovines in Mato Grosso do Sul.

KEY WORDS: *Neospora caninum*, parasite, abortion, beef cattle, dog.

RESUMO

Neospora caninum possui distribuição mundial e é considerada uma importante causa de aborto em bovinos. Amostras de soro sanguíneo de gado de corte provenientes das regiões de Campo Grande e Pantanal e de cães provenientes de Campo Grande foram avaliadas para detectar anticorpos contra *N. caninum*. Para detectar anticorpos de *N. caninum* em cães foi usada a reação de imunofluorescência indireta e em bovinos o teste ELISA comercial. Na região de Campo Grande, soros positivos para *N. caninum* apareceram 5,58 vezes mais em vacas com histórico de aborto (43%) do que em vacas sem

este histórico (7,7%). Na região do Pantanal, 30% das novilhas avaliadas foram soropositivas. Dos cães avaliados, 30% apresentaram resultados positivos. Os resultados preliminares sugerem a presença de abortos relacionados com o aumento da sorologia positiva para *N. caninum* em bovinos no estado de Mato Grosso do Sul.

PALAVRAS-CHAVE: *Neospora caninum*, parasita, aborto, gado de corte, cão.

Infection with the coccidian parasite *Neospora caninum* causes paralysis and death in livestock and dogs (DUBEY; LINDSAY, 1996). The parasite has worldwide distribution and it is considered a major cause of bovine abortion (DUBEY, 1999). *N. caninum* was discovered in the tissues of dogs (DUBEY et al., 1988; LINDSAY et al., 1993), which were described as definitive hosts (McALLISTER et al., 1998), with a wide range of intermediate hosts.

Cattle are presumed to acquire the infection by ingesting

¹ Embrapa Gado de Corte; BR 262, km 4; Caixa postal 154; Campo Grande, MS 79002-970, Brazil. E-mail: andreott@cnpqc.embrapa.br

² University of Wisconsin; 2015 Linden Drive E1 Embrapa Gado de Corte; BR 262, km 4; Caixa postal 154; Campo Grande, MS 79002-970, Brazil. E-mail: andreott@cnpqc.embrapa.br West; Madison, WI 53706, USA.

³ Centro de Controle de Zoonoses, Prefeitura Municipal, Campo Grande, MS 79074-460.

oocysts from contaminated dog feces. Aborted bovine fetuses and congenitally infected calves can have tachyzoites and/or bradyzoites in their tissues, and dogs are infected with *N. caninum* when feeding on contaminated carcasses. In cows, parasite propagation by vertical transmission via placenta can infect offspring (DUBEY, 1999). Venturini et al. (1999) have reported *N. caninum* bovine infections in Argentina. The occurrence of the parasite in dairy cattle in Brazil has been reported by Gondim et al. (1999) and Locatelli-Dittrich et al. (2001).

A beef cattle herd with reported abortion history in the state of Mato Grosso do Sul was investigated to determine infection with *N. caninum*. The state lies in the Center-Western Region, which is economically important for beef cattle production in Brazil.

Blood samples were collected from randomly selected cows from Campo Grande (an upland area, in a plateau roughly 600 meters above sea level) and from the Pantanal floodplain (a wetland area 200 meters above sea level) and from dogs from the upland region. Additional bovine sera were evaluated at owner's request in the event of recent abortion episodes. *Neospora caninum* tachyzoites were used as antigens to identify canine *N. caninum* antibodies in an indirect fluorescent antibody test (IFAT). An enzyme-linked immunosorbent assay (Neospora ELISA kit™, IDEXX Laboratories Inc., Westbrook, Maine, USA) was used to screen the bovine serum samples for antibodies against *N. caninum*.

In the upland region, positive samples were detected in seven out of 91 cows (7.7%), of which 40 were dams and their offspring (20 each, respectively); one cow with a history of abortion was positive. *N. caninum* antibodies were detected in 38 out of 90 cows (43%) with an abortion report. In the wetland region, 18 out of 60 heifers (30%) were positive for *N. caninum* antibodies. Serum samples from cows with a history of abortion from other regions of Brazil were also submitted by farmers for evaluation.

In the upland region, 12 out of 40 dogs (30%) were positive for *N. caninum* antibodies (IFAT, 1:100 titer). In sera samples from cows with an abortion history, anti-*Neospora caninum* antibodies were found to be 5.58 times as high as in cows without a similar history, suggesting that abortion may have been related to neosporosis. These results were similar to those found for cows by Locatelli-Dittrich et al. (2001). The serology results for dogs were similar to those obtained by Fernandes (2002).

In central Brazil, the use of dogs in the management of beef cattle may increase pasture and water contamination. Horizontal infection may occur via ingestion of pasture or feed contaminated with *N. caninum* oocysts shed by dogs (McALLISTER et al., 1998). The breeding season for beef herds extends from November to January and is dependent upon

pasture availability, and part of the gestation period takes place when the protein level is low and pasture is limited. This has an impact on the health condition of cows, which may result in limited immune protection against pathogenic agents.

Our preliminary data reveal the presence *N. caninum* in the beef cattle production system. The occurrence of *N. caninum* in heifers from the Pantanal (wetland) region was higher than that in cows from the Campo Grande (upland) region. The higher humidity and the presence of wild animals, mainly wild canids, may also play an important epidemiological role in the transmission of *N. caninum*. Further research is necessary to determine the regional epidemiology and the economic impact of *N. caninum* in Brazil.

Acknowledgements:- The authors thank FUNDECT-MS, Brazil, for the financial support provided.

REFERENCES

- DUBEY, J. P.; CARPENTER, L. J.; SPEER, C. A.; TOPPER, M. J.; UGGLA, A. Newly recognized fatal protozoan disease of dogs. *Journal of American Veterinary Medicine Association*, v. 192, n. 9, p. 1269-285, 1988.
- DUBEY, J. P.; LINDSAY, D. S. A review of *Neospora caninum* and neosporosis. *Veterinary Parasitology*, v. 67, n. 1, p. 1-59, 1996.
- DUBEY, J. P. Neosporosis in cattle: biology and economic impact. *Journal of the American Veterinary Medicine Association*, v. 214, n. 8, p. 1160-1163, 1999.
- FERNANDES B. C. T. M.; GENNARI, S. M.; SOUZA, S. L. P.; CARVALHO, J.; OLIVEIRA, W. G.; CURY M. C. Frequency for antibodies to *Neospora caninum* in dogs from urban, periurban and rural areas to Triangulo Mineiro, Minas Gerais, Brazil. In: CONGRESSO BRASILEIRO DE PARASITOLOGIA VETERINÁRIA, 12., 2002, Rio de Janeiro. *Anais...* Rio de Janeiro: CBPV, 2002. CD-ROM.
- GONDIM, L. F.; SARTOR, I. F.; HASEGAWA, M.; YAMANE, I. Seroprevalence of *Neospora caninum* in dairy cattle in Bahia, Brazil. *Veterinary Parasitology*, v. 86, n. 1, p. 71-75, 1999.
- LINDSAY, D. S.; SPEER, C. A.; TOIVIO-KINNUNAN, A. A.; DUBEY, J. P.; BLAGBURN, B. L. Use of infected cultured cells to compare ultra structural features of *Neospora caninum* from dogs and *Toxoplasma gondii*. *American Journal of Veterinary Research*, v. 54, n. 1, p. 103-106, 1993.
- LOCATELLI-DITTRICH, R.; SOCCOL, V. T.; RICHARTZ, R. R. T. B.; GASINO-JOINEAU, M. E.; VINNE, R.; PINCKNEY, R. D. Serological Diagnosis of Neosporosis in a Herd of Dairy Cattle in Southern Brazil. *Journal of Parasitology*, v. 87, n. 6, p. 1493-1494, 2001.
- McALLISTER, M. M.; DUBEY, J. P.; LINDAY, D. S.; JOLLEY,

- W.R.; WILLS, R. A.; McGUIRRE, A. M. Dogs are definitive hosts of *Neospora caninum*. *International Journal for Parasitology*, v. 28, n. 9, p.1473-1478, 1998.
- VENTURINI, M. C.; VENTURINI, L.; BACIGALUPE, D.; MACHUCA, M.; ECHAIDE, I.; BASSO, W.; UNZAGA, J. M.; DILORENZO, C.; GUGLIELMONE, A.; JENKINS, M. C.; DUBEY, J. P. *Neospora caninum* infections in bovine fetuses and dairy cows with abortions in Argentina. *International Journal for Parasitology*, v. 29, n. 10, p. 1705-1708, 1999.

Recebido em 24 de junho de 2004

Aceito para publicação em 03 de novembro de 2004.