Розділ 7. Паразитологія

PREVALENCE OF NEOSPORA CANINUM ANTIBODIES IN CATTLE

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Neosporosis is a worldwide protozoan disease of cattle that has been associated with endemic, epidemic and sporadic abortions and decreased milk production. Abortion can occur at any stage of pregnancy. Early fetal death and fetal resorption have also been reported. Most important route of transmission is vertical, from infected cow to foetus during pregnancy. Definitive host is a dog, which shedding infective oocists by feces. Aim of this study is estimate the seroprevalence of N. caninum in cattle from different region of Vojvodina, northen part of Serbia and one from Bosnia. We examined 67 serum samples and found 26,87% seropositive cattle. High prevalence is present in grazing cattle, which have direct contact with dogs, final parasite host. We registered highest seroprevalence (48,15%) in Banatski Dvor, lowest in Han Pijesk, 11,1%. There was apparent association between N. caninum seroprevalence and animal husbandry practices, and the cattle under confinement feeding had significantly lower seroprevalence than the grazing cows. The results of the present survey indicated that infection with N. caninum in dairy cattle is widespread in Vojvodina Province, and it appears to be an important cause of bovine abortion.

Neospora caninum is pathogenic protozoa considered as the mayor cause of abortion in cattle around the world (Dubey et al., 2007). Until now the infections described in all domestic animals, cattle, sheep, goats, horses, etc. A few studies have so far proven anti-bodies by people, except in imunocompromised, HIV positive (Dubey, 2007). The most important route of transmission is transplacental, vertical transmission of infectious tachyzoites from cows to the foetus during pregnancy (Dubey et al., 2007). In developmental cycle there are three known infectious stages: tachyzoites and tissue cysts are located in the intermediate hosts, and they occur intracellularly. Tachyzoites are approximately 6 by 2 μm. Tissue cysts are round or oval, and found primarily in the central nervous system. The tissue cyst are enclosed with bradyzoites (Dubey et al., 2007). Extraneural tissues, especially muscles, may contain tissue cysts (Dubey et al.2004). Oocysts, which are the environmentally resistant stage of parasite, are excreted in the feces of final host, dogs and coyotes in an unsporulated stage (188). Oocysts sporulate outside the host in around 24 hours (Dubey et al., 2007). Carnivores probably become infected by ingesting tissues containing bradyzoites, and herbivores probably become infected by the ingestion of food or drinking water contaminated by *N. caninum* sporulated oocysts (Dubey et al., 2007). Dogs have so far been the most important final hosts, and in the latest literature has proven to be the foxes and other wild carnivores. The possibility of sylvatic cycle could have important implications since they might influence the prevalence of infection in cattle (Sobrino at al. 2008).

The most common clinical sign associated with canine neosporosis is ascending paralysis in young congenitally infected pups. Pups may also experience difficulty swallowing, muscle atrophy, and heart failure. However, dogs of any age may be affected by neosporosis. Cases of nodular dermatitis, polymyositis, and focal or multifocal central nervous system disease because of neosporosis in dogs from 18 months to 6 years old have been documented (Knowler and Wheeler 1995; Patitucci et al. 1997). Although the parasite can be transmitted transplacentally in several hosts and the vertical route is the major mode of its transmission in cattle, the role of the definitive host in spreading the infection through shedding of oocyst is important. Carnivores can acquire infection by ingestion of infected tissues (McAllister et al. 1998; Dijkstra et al. 2001). Neosporosis of cattle that has been associated with endemic, epidemic and sporadic abortions (Dubey et al. 2007; Hall et al. 2005; Kul et al. 2009) and decreased milk production (Thurmond and Hietala 1997). Abortion can occur at any stage of pregnancy; however, infected cows can also give birth to diseased, sub-clinically infected or healthy calves (Dubey et al. 2007). Early foetal death and foetal resorption have also been reported (Dubey1999).

The aim of the work was to determine prevalence of *Neospora caninum* antibodies in the cattle from different herds in Vojvodina and mountain region of Bosnia.

Material and methods. Research has been done in the Laboratory for Parasitology, at Department for veterinary medicine, Faculty of Agriculture in Novi Sad. Randomised blood samples were taken for serology from 67 cows in four herds with a history of sporadic abortion. Blood samples have been collecting in the period from March to July 2009. from four regions: three from Vojvodina (Banatski Dvor, Krčedin and Novi Sad) and one from Han Pijesak,osnia, Blood samples were collected from the jugular vein using vacutainer tubes, stored for 1 to 2 h at room temperature and then centrifuged at 1,500×g for 10 min. The sera were stored at −20°C until used. They were assayed using indirect fluorescent antibody assay (IFAT) for the detection of anti-*N. caninum* antibodies, as described elsewhere (Dubey et al., 1988). We prepared IFAT with commercial antigen (VMRD, USA). We used anti-cattle IgG commercial conjugate, positive and negative control sera, from the same producer. To achieve high specificity, the dilutions of 1:200 were adopted as cut-off points, according to the instructions producers. Only samples that demonstrate complete peripheral fluorescence of the tachyzoites were considered positive. Samples showing only apical fluorescence were considered negative.

Samples from Banatski Dvor and Krcedin were from dairy cattle but other was from beef calves. Cattle from Banatski Dvor grow to be freely is kept in the untethered indoors so that they are in constant closed contact with dogs, while the other three groups are grown under confinement feeding and do not have contact with dogs.

Results and discussion. In order to determine prevalence of antibodies to the *Neospora caninum* have been examined the 67 serum samples and antibodies are proven by 18 (26.87 %) cattle.

Statistical analysis, with the $\chi 2$ test, was proven statistical significant differences in appear antibodies to the *Neospora caninum*. We registered highest seroprevalence in dairy cows from Banatski dvor (48.15%) and lowest in Han Pijesak (11,11%) .Results are shown in Table 1.

There was apparent association between *N. caninum* seroprevalence and animal husbandry practices, and the cattle under confinement feeding had significantly lower seroprevalence than the grazing cows ($P<0.05$).

The results of the present survey indicated that infection with *N. caninum* in dairy cattle is widespread in Vojvodina Province, and it appears to be an important cause of bovine abortion.

Table 1 – Prevalence of antibodies to N. caninum in cattle from Vojvodina and BiH

Location	*Number of samples*	*Positive*
Banatski dvor	27	13/48.15%
Krčedin	25	3/12.00%
Novi Sad	6	1/16.67
Han Pijesak	9	1/11,11%
total (%)	67	18/26.87%

In numerous studies prepared in the past few years, seropositivity is proven by almost all domestic and wild animals, except in birds. In Argentina, (Moore et.al 2002) prevalence of antibodies to *N. caninum* ranging from 16.6 per cent, up to 64.5 per cent by dairy calves in different regions, the largest percentage is able to cows with abortus.

In Australia *Neospora caninum* was registered at 14.9 per cent cattle and by 24% dairy cows (Boultron et al.1995) while in Mexico (Morales et al. 2001) prevalence even stood at 77 %. According to data from USA 1991, prevalence it stood at 24.4 per cent while at the research in 1995 stood at 42.5 per cent (Anderson et al. 1995), which indicates that the percentage infected cattle increases.

According to the other authors, the largest seroprevalence show cows in which the registered abortions, while the seroprevalence by beef cattle mainly lower and depends on the way keeping animals and the cattle under confinement feeding had significantly lower seroprevalence than the grazing cows (Wang C. at all. 2009). Dogs as well as the most important final hosts is a permanent source of infection, especially those in the cattle herds (Kamga-Walajadjo et al. 2009).

A large number of studies conducted back several years, shows an exceptional importance *N. caninum* in vetrinary medicine and animal production, due to losses that causes in breeding cattle (Vaclavek et al., 2003).

Even though the parasite first described in 1984 it's taxonomically position is clear from last 10 years (Dubey et al., 1996). But his pathogenic importance and epidemiological features is not very clear.

Due to the extreme similarities with *Toxoplasma gondii* very important causal agent of abortions in humans which is the only verified definitive host cat, it can be expected that the only in the future *N. caninum* become interesting for human population. There are still recruited data about it and *N. caninum* for now unknowns out there. Several serological study cannot with certainty excluded zoonotic importance of this parasite (McCann et al., 2008).

Conclusion. Our research has shown that the antibodies to the *Neospora caninum* present at 26.87 per cent examined cattle. There was apparent association between *N. caninum* seroprevalence and animal husbandry practices, and the cattle under confinement feeding had significantly lower seroprevalence than the grazing cows. The results of the present survey indicated that infection with *N. caninum* in dairy cattle is widespread in Vojvodina Province, and it appears to be an important cause of abortion in cows.

Literature

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РОЗПОВСЮДЖЕНІСТЬ АНТИТІЛ *NEOSPORA CANINUM* У ВЕЛИКОЇ РОГАТОЇ ХУДОБИ

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Неоспороз – широко розповсюджене протозойне захворювання великої рогатої худоби, яке асоціюється з ендемічними, епідемічними та спорадичними абортами та зниженням виробки молока. Метою даного дослідження є оцінка розповсюдженості N. canipum у великої рогатої худоби з різних областей Воєводіни, північної частини Сербії та з однієї області Боснії.