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Seroprevalence of *Neospora caninum* in dairy cattle in Eastern Algeria

Bouaziz Omar*, Dib Amira Leila, Aimeur Rachida, Lakhdara Nedjoua, Bouaziz Assia and Bererhi El Hacène

Laboratory of Management of Health and Animals Productions (GSPA), Institute of Veterinary Science, University of Constantine 1, 25100, Algeria

ABSTRACT

Neosporosis is an emergent disease in cattle, due to a protozoan called *Neospora caninum*. In adult cattle, the infection with *Neospora caninum* results particularly in abortions. The abortive role of this parasite was demonstrated for the first time in 1989. Since that, this role was confirmed in number of countries by several authors. The importance of this emergent disease as a principal cause of abortion increased the interest to search this unknown affection in livestock in Algeria. Thus a study has been conducted in order to detect neosporosis in bovine farms in the region of Constantine. The aim of this study is to search the antibodies of anti *Neospora caninum* using the technique ELISA in order to evaluate its prevalence in serum of cows having aborted or not tested serologically negative vis-à-vis of the main abortive diseases of cows in dairy cattle farms in Constantine. The results obtained show a prevalence of 16% of positive females to *Neospora caninum*. On the other hand, the seroprevalence of *Neospora caninum* in cows having aborted is 25%. This study shows that *Neospora caninum* is a parasite present in bovine livestock in Algeria. There is a need to evaluate the importance of this infection in a large number of breedings by seroepidemiological survey.

Key words: *Neospora caninum*, ELISA serology, Abortion, Cattle.

INTRODUCTION

Neospora caninum is recognized as being one of the principal agents responsible of abortion worldwide. In number of countries, it is considered either as the main abortive infectious agent [1], or as one of the main agents: 11,9% in Belgium [2], 17% of the repeated abortions and 24 % of the sporadic abortions in Bretagne [1].

If the implication of *Neospora caninum* in abortions of cattle abroad is no longer demonstrated, few elements are currently known in Algeria.

The importance of this emergent disease as principal causes of abortion of cattle has motivated the interest to search this unknown affection presently in breeding of cattle in Algeria.

The objective of this study is to search the presence of antibodies anti *Neospora caninum* in sera from all cows or having aborted in the bovine breeding in the region of Constantine.

MATERIALS AND METHODS

Material

This study was reported in a herd of 145 cows of Prim – Holstein breeds belonging to 6 breeding where some sporadic cases were reported. The blood samplings were realized on 145 cows, in which 20 have aborted.

Serological test

The research of antibodies anti *Neospora caninum* in cattle sera was realized using an ELISA kit (IDEXX Laboratoires France).

RESULTS AND DISCUSSION**1. Seroprevalence of *Neospora caninum* in cattle**

Table 1 give serological results in 6 cattle breeding. The global prevalence of *Neospora caninum* is 16% in cattle (23 /145).

Table 1: Serology results to *Neospora caninum*

Breeding	Number of analyzed sera	Number of positive sera	Percentage of positive sera
E1	31	9	29
E2	25	3	12
E3	27	4	15
E4	21	0	0
E5	21	4	19
E6	20	3	15
Total	145	23	16

The percentage of positive females to *Neospora caninum* (16%) obtained in this survey is quite similar to those obtained by Journel (1999) [4]. This prevalence is higher to that obtained by Bouaziz *et al.* (1999) who has reported a seroprevalence towards *Neospora caninum* equal to 10,34% [5]. Contrariwise, it is lower to the proportions 26,3% et 28,3% reported respectively by Chemly *et al.* (2002) in Tunisia [6] and Peyron *et al.* (2004) in France [7]. Ghalmi *et al.* (2011) confirmed the occurrence of *Neospora caninum* in cattle breeding in the Algerian North or North East with a mean prevalence in cows of 19%, using the indirect immunofluorescens method (I.F.I.) [8]. The obtained results show that there is not a systematic abortion in the case of infection by *Neospora caninum*: some cows did not abort even with the high seropositivity.

These results are comparable to those reported by Anderson *et al.* (1995). These latter reported that the survey over 2 years in 2 Californian exploitations where 36% et 58% of the cows were seropositive, showed that only 15 à 18% of the infested cows abort and 81% of calves born infested did not show any neurological trouble [9]

Distribution of positive females according to age class

The table 2 gives the distribution of positive animals by age class. It appears that the most affected animals are those whose age varies from 3 and more. There is a significant difference of the seroprevalences among the classes ($P < 0,05$). Razmi and *al.* (2006) reported similar results in Iran [10].

Table 2: Distribution of positive females by class of age

Age classes	Number of positive animals	Percentage of positive animals
-2 years	4	17,4
3 to 5 years	10	43,5
6years and more	9	39,1
Total	23	100

2. Serology of aborted cows

Among the 20 sera withdrawn from the cows having aborted and negative to the other abortive diseases, 5 show a positive reaction to *Neospora caninum*, which is 25 % of the cows. 4 breedings of the 6 studies detain at least one seropositive cow, with a seroprevalence of 66,6 % of the contaminated livestock (table 3).

Table 3: distribution of the positive abortions to *Neospora caninum* accoring to breedings

breedings	Nombre of positive abortions to <i>Neospora caninum</i>	Percentage of positive abortion to <i>Neospora caninum</i>
E1	2	40
E2	0	0
E3	1	20
E4	0	0
E5	1	20
E6	1	20
Total	5	100

25% of sera from cows having aborted are positive to *Neospora caninum*. This corresponds to results obtained in France in the study of Peyron *and al.* (2004) where prevalence to *Neospora caninum* in bovine that aborted is of 25,7 % [7] and in Mexico by Garcia Vasquez *et al.* (2005) who reported that 26% of abortion are attributed to *Neospora caninum* [11].

On the other hand, this frequency is below to that observed in the study of Chemly *and al.* (2002) in Tunisia who reported a seroprevalence of *Neospora caninum* of 31,7% in sera where no other cause of searched abortion was serologically diagnosed [6]. Anderson *et al.* (1995) reported that *Neospora caninum* is responsible of a frequency of 43,5% of abortions in bovine breeding in California [9].

Influence of the gestation stage

The abortions occurred between 6 and 8 months of gestation (tableau 4), as it is described in the study of de Pitel *and al.* (2000) [12]. The size of the samples of the seropositive females (5 cows) does not allow to objectify the impact of *Neospora caninum* on the gestation.

Table 4 Distribution of the number of positive abortions to by *Neospora caninum* according to gestation stage

Months of gestation	Number of positive abortions
6	2
7	1
8	2
Total	5

Nevertheless, the epidemiological data reported by Anderson *et al.* (1995) show that the abortions are sporadic, and occur in dairy breeding of medium size in cows between the 4th and the 8th month of gestation [9].

Barr *and al.* (1991) show the correspondent age at a particular stage of *Neospora caninum* [7]. This age corresponded to the most instable moment in the relation host-parasite and was related to the maturity of immune and inflammatory systems. The majority of abortion occurs from the 5th month of gestation. The part of the abortion attributable to *Neospora caninum* is very variable according to the used tests and the interpretation of the results [7]

CONCLUSION

This study shows that *Neospora caninum* is a parasite present in the bovine population in Algeria. In fact, 16% of the tested animals have serologic traces of an infection of this parasite and 25% of the abortion could be due to this parasite. In order to confirm these data that show the magnitude of the seropositivity of *Neospora caninum* in the abortions, one should not only search directly the parasite in the runt by using powerful tools such as PCR; immunohistochemistry in order to confirm the diagnosis of the emergent protozooses but also evaluate the importance of this infection in a large number of breedings by seroepidemiological surveys.

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