

PRELIMINARY RESULTS ON SEROPREVALENCE OF BLUETONGUE IN SHEEP IN KOSOVO

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Abstract

In recent years animal viral diseases transmitted by vectors are distributed fairly quickly in different regions of the world, including bluetongue virus (BTV). BT is a disease of ruminants transmitted by midges of the species Culicoides. The objective of the study was to describe seroprevalence rate of bluetongue virus in sheep flocks in different regions in Kosovo. The blood samples were collected randomly from sheep herds. The total 355 samples were collected, in 55 sheep herds, from 9 municipalities in 42 villages in whole Kosovo, between year 2014 and 2015. Antibodies for BTV in sera were detected by competitive enzyme-linked immunosorbent assay (c-ELISA) according to manufacturer instructions. Out of total 355 serum samples 32 sheep (9.014) were positive for BTV antibodies, from 9 municipalities in two regions. The highest prevalence of BTV antibodies were detected in Vitia municipality (16.42%) followed by Kamenica (14.81%), and Gjilani (10.00%), municipalities belonging to the same region, and the lowest prevalence in Shterpc (5.56), and Kaçanik (5.26%). This study describes seroprevalence of BTV in sheep flocks in Kosovo indicating widespread prevalence of BTV antibodies in studied regions.

Key words: bluetongue virus, seroprevalence, sheep herds, Kosovo.

INTRODUCTION

Bluetongue (BT) is a disease of ruminants caused by bluetongue virus (BTV), a non-contagious vectorborne Orbivirus (Wilson and Mellor, 2009). Already they reported 24 serotypes of the virus. The virus can be replicated to all ruminants (domestic and wild), but the disease, with clinical signs, are most commonly seen in improved breeds of sheep (Hofmann et al., 2008).

Clinical signs in sheep are: fever up to 42°C, depression, lameness, oedema of the lips, tongue and head, conjunctivitis, coronitis, excessive salivation, nasal discharge, hyperaemia and pain at muco-cutaneous junctions, such as the gums and vulva. Pulmonary oedema can cause difficulty in breathing. Erosions in tongue can progress to ulcers (Bërxfholi and Haas, 2014).

The BTV is transmitted between its ruminant hosts by certain species of biting midges of the genus *Culicoides*. Cattle are the main reservoir for the BT virus, although, currently the cattle show no clinical signs. After infection, cattle

develop viremia phase, which can last up to 100 days (Purse et al., 2005).

The European BTV outbreaks registered in 1998, reported high mortality in sheep. The importance and the potential impact of BT outbreaks on animal production have been heightened by the recent re-emergence of BT in Mediterranean and south-eastern Europe (Baylis and Mellor, 2001). The disease can appear in the form of acute, subacute or without clinical signs (Mellor and Wittmann, 2002). The severity of the disease depends on the breed of the animal, the animal's age (older sheeps are more sensitive) and the serotype of the virus (Mellor et al., 2009).

The spread of these pathogens by vectors is the consequence of the climate change and of the human activities upon the environment. (Randolph, 2008). The spread of the disease is seasonal and depends on the presence of vectors, appearing more in the late summer season (July-September) (Hendrickx, 2009).

The recommended laboratory methods for the detection of BTV antibody are the agar-gel immunodiffusion (AGID) and c-ELISA

(enzyme-linked immunosorbent competitive assay) (Velic, 2004). BT disease cases were reported in Kosovo in 2001 from BTV serotype 9 (Osmani et al., 2006) and in 2014 (personal observation, N. Marku). Presence of *Culicoides* in Kosovo as disease vectors are reported in year 2010 (Berisha et al., 2010).

The purpose of this research is to assess the seroprevalence of BTV in sheep's in Kosovo.

MATERIALS AND METHODS

The collection of sheep blood samples: were collected 355 serum samples, from different sheep, as age and gender, during 2014 and 2015. Samples were taken in 9 municipalities (Podujeva, Prishtinë, Obiliq, Kamenica, Gjilan, Kaçanik, Shterpc, Suhareka and Viti), 42 villages, from 55 sheep herds (Table 1). Serum samples were kept frozen at -20°C until tested. All sera were tested using competitive enzyme-linked immunosorbent assay (c-ELISA).

Group-specific antibodies for BTV in sera were detected by competitive enzyme-linked immunosorbent assay (c-ELISA) according to manufacturer instructions (IDEXX®, Westbrook, USA), at Food and Veterinary Laboratory in Kosovo.

RESULTS

All samples were analyzed by c-ELISA test. The overall prevalence rate of BTV antibodies among sheep was estimated 9.014% BTV (32 out of 355 samples).

The number of positive samples was with highest prevalence in Viti 16.42%, (22 samples positive) followed by Kamenica with 14.81% (4 samples positive) and Gjilan 10.00% (4 samples positive). The number of positive samples by municipality is presented in fig 1.

Positive samples were from five municipalities, including Kamenica, Gjilan, Shtërpc, Kaçanik and Viti, and no positive cases are found in Podujeva, Prishtina, Obiliq and Suhareka. The current results indicate widespread prevalence of BTV antibodies in studied regions.



Fig. 1. Percentages of animals tested seropositive for bluetongue virus in different municipalities in Kosovo in 2014-2015.

Table 1. Results from samples analysed for BTV in sheep samples taken in different municipalities in Kosovo in 2014 and 2015.

Municipality	No. villages	Animal	No. sample	Positive cases	%
Podujeva	5	Sheep	26	0	0.00%
Prishtinë	3	Sheep	29	0	0.00%
Obiliq	2	Sheep	27	0	0.00%
Kamenica	6	Sheep	27	4	14.81%
Gjilan	5	Sheep	40	4	10.00%
Shterpc	1	Sheep	18	1	5.56%
Kaçanik	4	Sheep	19	1	5.26%
Suhareka	4	Sheep	35	0	0.00%
Viti	12	Sheep	134	22	16.42%
Total	42		355	32	9.014 %

DISCUSSIONS

In recent years the BT disease is prevalent in many countries in different regions of the world, according to many authors this is due to climate change as the main factor (MacLachlan, 2004). The BTV is considered a major problem for veterinary medicine due to the rapid spread, mortality and economic losses caused by this disease (Saegerman, 2008).

The first disease outbreak occurred in Kosovo in sheep in 2001 in caused by BTV serotype 9 (Osmani et al., 2006). The BTV-9 are reported in neighbouring countries in Greece, Bulgaria and Turkey (Nomikou et al., 2004), Serbia, Croatia, Bosnia (Maan et al., 2004). The second disease outbreak is observed in 2014 (personal observation N. Marku).

The preliminary results of this survey confirm the presence and high prevalence of the BTV in sheep, in Kosovo. According to these results, infection has different levels in different regions, but still higher prevalence are found in municipalities belonging from same region, including Viti (16.42%), and followed by the Kamenica (14.82%) and Gjilani 10.00%. The prevalence of BTV antibodies of 9.014% in sheep blood samples, and the presence of disease vectors, are the conditions for the persistence of BT virus in Kosovo, so the infection became endemic. Detection of BT positive samples in five municipalities shows that the virus is widespread in different areas within the country.

The high level of seroprevalence reported in this research, is asking the application of preventive measures for BT virus in Kosovo. Maybe vaccination can be an effective measure as reported in Purse et al., (2005). According to previous data (Pioz et al., 2014), the application of vaccination has significantly decreased the spread of the BTV in France.

CONCLUSIONS

The detection of specific antibodies from 355 samples analyzed for BTV, it found 32 samples positive (9.014%), expressing a high prevalence of BTV in Kosovo.

The new studies should analyse other risk factors that affect the spread of the virus and the presence of BTV, including factors

associated with animals, vectors and environment. Data from this research should serve to develop a strategy for monitoring and controlling the BT disease.

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