



SHORT COMMUNICATION

Serological Status of Bovine Herpes Virus Type 1 in Cattle in Small Scale Private Farms in the Central Black Sea Region, Turkey

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ABSTRACT

Bovine herpesvirus type 1 (BHV-1) is associated with a variety of clinical manifestations in cattle including respiratory and genital diseases. The current study was undertaken to investigate the serological status of BHV-1 in cattle in four provinces of the Central Black Sea Region Turkey. Blood samples were collected from 501 cattle and analyzed using Enzyme Linked Immunosorbent Assay (ELISA). A total of 224 (44.71%) serum samples were found positive against BHV-1. Seropositivity rate ranged from 34.66 to 67.74%. The result indicates that BHV-1 is widely disseminated in unvaccinated cattle in Black Sea Region and control strategies, including comprehensive vaccination program should be adopted.

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INTRODUCTION

Bovine herpesvirus type 1 (BHV-1) is a member of the genus *Varicellovirus* in the subfamily *Alphaherpesvirinae* which belongs to the *Herpesviridae* family (Ackermann and Engels, 2006). Virus causes respiratory and genital tract infections in domestic and wild cattle known as infectious bovine rhinotracheitis (IBR) and infectious pustular vulvovaginitis (IPV) (Nandi *et al.*, 2011). BHV-1 can establish latent infection in animals which subsequently becomes a major source for virus spread (Ackermann and Engels, 2006).

BHV-1 is a worldwide disseminated pathogen causing great economic losses, mainly due to a variety of genital disorders, including abortion, infertility, decreased milk production and weight loss in the livestock industry (Tan *et al.*, 2006; Yan *et al.*, 2008). Some countries in the European Union, including Denmark, Finland, Sweden, Austria have successfully eradicated BHV-1 (Ackermann and Engels, 2006). Previous studies on the BHV-1 infection in cattle in Turkey reported a seroprevalence in the range of 19.5 to 74 % (Alkan *et al.*, 2005; Tan *et al.*, 2006; Gumusova *et al.*, 2007; Gür, 2011).

This study was aimed at investigation of seroprevalence and the potential risk of BHV-1 infection in cattle on small scale farms in rural areas of Central Black Sea Region, Turkey.

MATERIALS AND METHODS

A total of 501 blood samples were collected from cattle in rural areas of four different provinces (Sinop, Tokat, Amasya, Samsun) of Central Black Sea Region, Turkey. Animals were randomly selected from small scale private farms. Cattle were apparently healthy, unvaccinated and ≥ 1 year old. Sera were extracted, inactivated at 56°C for 30 min and stored at -20°C until tested. A commercial gB-blocking ELISA (Idexx, P03145, France) test kit based on the competition between the bovine serum and anti gB antibody was used for the detection of antibodies against BHV-1 by following manufacturer's instructions. The sensitivity and specificity of this assay was up to 95 and 99% respectively. Plates were read using ELISA reader (BioTek instruments, USA) at 450 nm. Data was analyzed statistical analysis by using Chi-square test. The Results were considered statistically significant at $P < 0.05$.

RESULTS AND DISCUSSION

A total of 501 serum samples were examined for antibodies against BHV-1 (Table 1). Out of these, 224 (44.71%) samples were found positive. Seropositivity rate ranged from 34.66 to 67.74%. Seroprevalence for BHV-1 was the highest (67.74%) in Amasya followed by Samsun (44.03%), Sinop (37.09%) and Tokat (34.66%). There

Table 1: Seroprevalence of BHV-1 by ELISA in cattle from four different provinces of Central Blacksea Region, Turkey

Provinces	No of cattle tested	ELISA test results for BHV-1	
		Number of Positive Sera	Percentage of Seropositivity (%)
Samsun	302	133	44.03 ^b
Sinop	62	23	37.09 ^b
Amasya	62	42	67.74 ^a
Tokat	75	26	34.66 ^b
Total	501	224	44.71

Values bearing different superscript in column differ significantly (P<0.05).

was a statistically significant difference in BoHV-1 seroprevalence in Amasya province (67.74%) compared with other three provinces (Table 1). There was no significant difference in the prevalence of antibodies against BHV-1 between Samsun, Sinop and Tokat provinces.

Worldwide, seroprevalence of BHV-1 has been reported to be 33-36, 35.8, 37.7, 39.2 and 61% in Belgium Boelaert *et al.*, 2000), China (Yan *et al.*, 2008), Poland (Rypula *et al.*, 2012), India (Nandi *et al.*, 2011) and Italy (Cavinari, 2006), respectively. In Turkey, 19.5 to 74% seroprevalence of BoHV-1 has been reported in the previous years (Alkan *et al.*, 2005; Tan *et al.*, 2006; Gumusova *et al.*, 2007). In present study, the overall seroprevalence of BHV-1 was 44.71% with ELISA and this seroprevalence varied between 34.66 to 67.74% in the investigated provinces. In a previous study, Alkan *et al.*, (2005), reported an overall 48.3% seroprevalence of BoHV-1 with NT in Blacksea Region of Turkey. The seropositivity rate obtained in current study (44.1%) is lower than that reported by Alkan *et al.* (2005). In the past, Alkan *et al.* (2005) and Gumusova *et al.* (2007) reported 73.5 and 61% seroprevalence for BHV-1 in the Samsun province, respectively. Their seropositivity rate was higher than the results of present study.

However, in contrast to previous studies, in this study unvaccinated cattle at small scale private farms were screened. In this context, seropositivity rate in Samsun was significantly high. This ratio depends on several factors such as ongoing BHV-1 infection, procurement of animals without screening against BoHV-1 and uncontrolled animal movement (Tan *et al.*, 2006). Especially, uncontrolled animal movement is important for Samsun province having large livestock markets. Alkan *et al.* (2005) determined as 0.5% seropositivity of BHV-1 in Amasya province and 3.9% seropositivity in Tokat province whereas in the present study 67.74% animals were positive in Amasya and 34.66% in Tokat. These rates were higher than the results of previous study (Alkan *et al.* 2005) and may be due to above mentioned

factors. The other major point, animal tested in our study was over 12 months of age. The cattle of any age are susceptible to BHV-1 but the disease frequently occurs in animals over 6 months old. Because these animals loss maternal immunity and are more prone to infectious agents.

Conclusion: The results of this study demonstrated that the overall seroprevalence of BHV-1 was 44.71% in Small Scale Private Farms in the Central Black Sea Region of Turkey in unvaccinated cattle. BHV-1 also be investigated in other regions of Turkey so that a comprehensive control strategy including restricting animal movements between regions and a vaccination program be proposed.

Author's contribution: ZY and HA conceived and designed the experiment. All authors performed the experiment. ZY wrote the manuscript, all authors read and approved the final manuscript.

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