



Seroprevalence of Pestiviruses in Some Goat Breeds in Samsun Province

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Abstract: There is a lack of information about the seroprevalence of pestiviruses in indigenous and composite goat breeds in Turkey. In this study, blood samples randomly collected from different domestic goat breeds (Anatolian black goat, Maltese and Saanen). The material consisted of 368 domestic goats, including 121 Anatolian black breeds, 125 Maltese breeds and 122 Saanen breeds from Samsun province. The serum samples were analysed for the presence of antibodies to pestiviruses using an enzyme-linked immunosorbent assay (ELISA). Seropositivity rates in Anatolian black, Saanen and Maltese breeds were detected as 3.31%, 2.46% and 6.40% for pestiviruses, respectively. Out of 368 serum samples examined, 15 (4.08%) were positive for pestiviruses. Maltese breed may be more susceptible for pestivirus infections than Saanen and Anatolian black goat breeds.

Keywords: ELISA, Goat, Pestiviruses, Seroprevalence, Turkey.

Samsun İlindeki Bazı Keçi Irklarında Pestivirusların Seroprevalansı

Öz: Türkiye’de yerli ve kültür ırkı keçi ırklarında pestivirusların seroprevalansına dair yeterli bilgi mevcut değildir. Bu çalışmada, çeşitli keçi ırklarından (Kıl keçisi, Maltız ve Saanen) rastgele örnekleme yoluyla kan örnekleri toplandı. Samsun ilinde 121 kıl keçisi, 125 Maltız keçisi ve 122 Saanen keçisi olmak üzere toplam 368 keçi kan serum örneği toplandı. Serum örnekleri ELISA metodu kullanılarak pestivirus antikorları yönünden test edildi. Seropozitiflik oranı Kıl keçisinde %3.31, Saanen keçisinde %2.46 ve Maltız keçilerinde ise %6.40 olarak tespit edildi. Toplamda 368 serum örneğinin 15’i (%4.08) pestivirus antikorları yönünden pozitif bulundu. Maltız ırkı keçiler, Kıl keçisi ve Saanen keçisi ırklarına göre pestivirus enfeksiyonlarına daha duyarlı olabilirler.

Anahtar Kelimeler: ELISA, Keçi, Pestiviruslar, Seroprevalans, Türkiye.

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INTRODUCTION

Pestivirus infections lead to economical losses both in large and small ruminant species. It is thought that such infections are common around the world. Pestiviruses are classified in the genus *Pestivirus* of the family *Flaviviridae*. The genus *Pestivirus* comprises four species, namely border disease virus (BDV) of small ruminants, bovine virus diarrhoea viruses 1 and 2 (BVDV 1, 2) of cattle and classical swine fever virus of pigs (1-5). Numerous studies have shown that pestiviruses are not highly host-specific. It has been reported that BVDV can infect not only cattle but also sheep, swine, goat, deer and giraffe, while BDV infects sheep, swine and goats (6). Clinical signs of border disease in sheep include barren ewes, abortions, malformations, stillbirths, and the birth of small weak lambs and persistent infections of the offspring. Affected lambs can show tremor, abnormal body conformation and hairy fleeces (so-called 'hairy-shaker' or 'fuzzy' lambs syndrome). BDV has also caused mucosal disease-like lesions in sheep (7).

The goat population in Turkey has reported as 10.347.159 by the Turkish Statistical Institute of Ministry of Development of Turkey (8). According to this report, 37.3% of hair production, 7.3% of meat production and 2.3% of milk production has been provided from goats in Turkey. Despite the importance of goats as economical income for especially rural people, with their milk (cheese production), meat and mohair production in Turkey, there exist no detailed information about serological evidence of pestiviruses of indigenous and composite goat breeds.

The objective of this study was to investigate the pestivirus infection serologically in different indigenous (Anatolian black goat) and composite goat breeds (Maltese and Saanen goats) reared in rural areas of Samsun province, and to detect the factors (age, breed, sex) influencing the epidemiology of pestivirus infections.

MATERIALS and METHODS

Ethical Committee Approval

The study protocols and experimental procedures were approved by the Scientific Ethics Committee of Samsun Veterinary Control Institute (No: 36).

Sample Collection and Processing

The samples were taken with simple random sampling method using the list of all farm owners of the region, from 368 goats (with 95% confidence level and 5% desired accuracy as a 30% expected prevalence). Blood samples were collected from goats, including 121 Anatolian black, 125 Maltese and 122 Saanen breeds from Samsun province and their towns (Havza, Tekkekoy) in the northern part of Turkey between January and September 2012. The age of animals varied from 6 months to 7 years. There was no clinical disorder recorded during the sampling, and no vaccination program had been applied against viruses examined in this study. Blood samples were taken from the jugular veins of the animals. Blood tubes were centrifuged at $3,000 \times g$ for 10 min, and the samples were transferred into sterile tubes and stored in -20°C until used. The commercial BVDV/MD/BDV p80 Protein Antibody ELISA kits were used, and the test was performed according to the producer's description. Plates were read with an ELISA reader at 450 nm and results were calculated. Suspected samples were retested by ELISA.

Statistical Analysis

Use of the chi-square test to determine significance of Maltese goat breed was more susceptible for pestivirus infections than indigenous Anatolian Black and composite Saanen goat breeds ($P < 0.01$)

RESULTS

Seropositivity rates in Anatolian black, Saanen and Maltese breeds were detected as 3.31%, 2.46% and 6.40% for pestiviruses, respectively. Out of 368

serum samples examined, 15 (4.08%) were positive for pestiviruses (Table 1).

Table 1. Positivity distribution of pestiviruses according to goat breeds, towns, sex and age.

Tablo 1. Pestivirusların keçi ırkları, ilçeler, cinsiyet ve yaşa göre dağılımı.

Goat breeds	Towns	Female	Male	Positivity/Total number of animals (%)		
				Kids< 1 year old	Adults > 1 year old	Total (%)
Saanen	Tekkekoy	2/108(1.85)	1/14(7.14)	0/15(-)	3/107(2.80)	3/122(2.46)
Maltese	Havza	8/105(7.62)	0/20(-)	(-)	8/125(6.40)	8/125(6.40)*
Anatolian Black	Tekkekoy	3/96(3.13)	1/25(4.00)	2/35(5.71)	2/86(2.33)	4/121(3.31)
Total		13/309(4.21)	2/59(3.39)	2/50(4.00)	13/318(4.09)	15/368(4.08)

* P<0.01

DISCUSSION and CONCLUSION

Serological studies carried out in the world show that prevalence of pestivirus infections ranged from five to 50% between countries and from region to region within countries (9). Numerous studies (10-16) conducted with regard to the pestivirus infection in Turkey have demonstrated that the infection is widespread in populations of sheep. The limited studies were performed for goat herds (17-20). These studies have reported that in various regions of Turkey pestivirus seroprevalence varies between 18.94-90.27% in sheep, and 5.7-63.6% in goats. This study is the first one to determine the seroprevalence of pestiviruses in randomly sampled different goat breeds in the northern of Turkey. In this study, samples from 15 (4.08%) goats were found seropositive against pestivirus. The range of seropositivity varied between 2.46% and 6.40% in different goat breeds. We did not find any relationships between seropositivity and gender, and age of the animals. But we found that a significant correlation between race of the animals and seropositivity of goat was noticed (P<0.01). This percentage is lower than the percentages found in studies conducted in the past years (17,19,20) and is similar to the percentages reported by Hasircioglu et al. (18). It is widely-known that the result of the seroprevalence studies are influenced by many

factors such as the number of sampled animals, the age of the animals, the time of sampling, the conditions of care and feeding, individual differences and so on. Okur-Gumusova et al. (10) reported significant differences among the prevalence rates of pestivirus in coastal and inland areas of Turkey due to climate characteristics that could play a major role in the spreading of the virus. Havza town is located in inland areas of northern Turkey and seropositivity rate is higher than the coastal areas (Tekkekoy). Also, this situation could be explained with the factors causing increase in the virus resistance, such as; keeping animals in crowded and insufficient aerodynamic conditions, animal breeding in primitive conditions, stress, insufficient feeding, inadequate knowledge of the animal owners with regard to preventive medicine, animal movements from one place to another and inadequate periodic laboratory investigations.

Seroprevalence of pestivirus in goats (4.08%) detected in this study was lower than that of sheep; this is not unusual since most of the previously studies showed similar results (20,21). Goats do not seem to be an efficient host for ruminant pestiviruses; persistent infections, which are vital for virus survival in cattle and sheep, have been rarely reported in goats (21). Another reason for the lower percentage of pestiviruses in goat breeds can

be related to the common use of live vaccines in sheep and cattle for the purpose of the control program for some viral infections, e.g. peste des petits ruminants, sheep and goat pox, etc. The most of the goats were not vaccinated against diseases. Pestiviruses are frequent contaminants of modified live virus vaccines produced on primary ovine and bovine cells, and may play a role in pestivirus maintenance and/or dissemination in the region (22).

It was concluded that, this study was the first statement of pestivirus infections in Maltese goat breed (composite goat breed of Turkey), and this breed was found markedly more susceptible to pestivirus infections than indigenous Anatolian Black and composite Saanen goat breeds.

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