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STUDIES ON THE PREVALENCE OF ANTIBODIES FOR PESTE DES PETITS RUMINANTS (PPR) AND RINDERPEST (RP) VIRUS IN SHEEP AND GOATS SERA

BY

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SUMMARY

A total of 182 sara samples were collected from two sheep breeds (mixed and Barki sheep) as wall as goats raised under arid conditions and examined by serum neutralization test (SNT) for neutralizing antibodies of PPR and RP viruses.

The results showed that at 1:4 serum dilution, 29.41% of mixed breed sheep, 29.82% of Barki sheep and 29.82% of goats sera contained antiboudies to PPR virus, while 2.9%, 12.28% of the two sheep breeds respectively and 7.0% of goats sera have antibodies to RP virus.

It could be concluded that the prevalence of neutralizing antibodies to PPR virus is equal in sheep and goats. No signifcant difference between the two sheep breeds tested for PPR virus antibodies, but RP virus antibodies was higher in the sera of Barki sheep than that of the mixed breed sheep. and the antibodies for PPR virus in the two sheep breeds were more prevalent than in goats.

INTRODUCTION

Peste des petits Ruminants (PPR) is a virus disease of goats and sheep that characterized by fever, nasal and oral discharge and mucosal erosions, often followed by sever enteritis and pneumonia. The disease is distinct from that caused by rinderpest virus in goats and sheep (Lefevre, 1982). Pulmonary involvement predominate in PPR whereas digestive lesions are dominants in rinderpest.

PPR virus has been considered as a variant of rinderpest virus naturally adapted to cause disease in goats and sheep but not cattle (Mornet et al, 1956). Subsequent studies of Gibbs et al., (1979) confirmed the antigenic difference between PPR and RP virus. The two viruses also are closely related serologically but are not identical and cross neutralization differentiate between them (Hamdy et al., 1976). PPR virus protected cattle against rinderpest and RP virus protected sheep and goats against PPR virus (Gibbs et al. (1979) and PPR virus was proposed as a fouth member of the Morbilli virus group.

In Egypt PPR virus was isolated from goats by Ismail and House (1990) and from sheep by Fayed et al., (1990). The pathogenicity of the virus for goats was studied by Ismail et al., (1990) and neutralizing antibodies in a percentage of 28.97 of sheep sera was reported by Hassan (1994).

The aim of this work was to study the prevalence of neutralizing antibodies in sheep breeds as well as goats for both PPR and RP virus.

MATERIAL AND METHODS

Blood samples:

A total of 182 blood samples were collected from 68 mixed breed (Barki x Marino), and 57 Barki sheep as well as 67 goats raised at the Desert Research institute station at Mariott. The sera were separated and kept at -20 C untill examined.

Viruses:

PPR virus strain "Egypt 87" was obtained from the virus strains collection bank of Animal Health Research Institute, and RP virus live attenuated "Kabete O" strain from Abbassia Serum and Vaccine Research Institute.

Call culture:

Vero cell line was obtained from the Virology Department of Animal Health Research Institute, Dokki, Giza, and used for propagation and titration of infectivity of the virus strains and in serum neutralization test (SNT). Growth medium was Eagl's minimal essential medium (MEM) supplemented with 10% newborn calf serum, 100 IU/ml penicillin and 100 ug/ml streptomycin. The maintenance medium was the same as growth medium except the serum concentration was reduced to 2%.

Serum neutralization test (SNT):

The infectivity of both PPR and RP viruses was titerated by the microtechnique according to Rossiter and Jesset, (1982) and the 50% end point of virus infectivity was determined according to Reed and Muench (1938). The sera were heat inactivated at 56C, for 30 minutes and the microtechnique of SNT was done according to Rossiter et al (1985) using 100 TCID 50 of both viruses.

RESULTS

The percentages of sera samples that cont antibodies to PPR and RP viruses and antibody titer for both viruses in 125 sheep from two breeds and 57 goats sera are show Tables, 1 & 2.

Table 1, showed that, Out of 68 sera samples f mixed breed sheep, 25(36.76%), 20 (29.41%), 4 (5.88%) of the samples contained antibodie PPR virus that ranged from 1:2 - 1:8. and sample has a titer of 1:32. Out of 57 sera samp of Barki sheep, 20 (35.08%), 17 (29.82%), an

Table 1: Serum neutralizing (SN) antibodies for PPR virus in sheep and goats sera.

Species & breeds	Nr. of samples.	SN antibody titer									
		1:2		1:4		1:8		1:16		1:32	
		nr.	%	nr.	%	nr.	%	nr.	%	nr.	%
Mixed sheep	68	25	36.76	20	29.41	4	5.88	0	0	1	1.47
Barki Sheep	57	20	35.08	17	29.82	3	5.26	0	0	0	0
Goats	57	18	31.57	17	29.82	1	1.75	0	0	0	0

(5.26%) have antibodies in a titer ranged from - 1:8. Only. Examination of 57 goats sera reve the persence of PPR antibodies in 18 (31.57%) (29.82%) samples in a titer ranged form 1:2 - and only one sample (1.75%) has antibody titer of 1:8.

Table 2, indicated that, RP virus neutrali antibodies are found in mixed breed sheep ser 8(11.76%), 2 (2.94%) and 5 (7.35%) samples titer ranged from 1:2 - 1:8, and one sample h titer of 1:39. Barki sheep sera showed antib to RP virus in 10 (7.54%) 7 (12.28%), 2(3.5%) out of the 57 samples examined and antibody titer ranged from 1:2-1:8, and only sample (1.75%) has a titer of 1:16. Examin of 57 goats sera showed the presence of RP v antibodies in 6(10.52%), 4 (7.01%), and 2 (samples with a titer ranged from 1:2 - 1:8.

DISCUSSION

Examination of sera samples collected from two sheep breeds (Barki and Mixed breeds) as well as goate for the prevalence of the neutralizing antibodies for PPR and Rp virus revealed that (Table 1&2), at 1:4 serum dilution the percentage of sheep sera that contained antibodies to PPR virus was 29.41% in Mixed sheep and 29.82% in Barki sheep and the same rate (29.82%) in goats. This result indicated that there is no significat difference in the prevalence of PPR virus antibodies in the two sheep breeds examined and the prevalence of these antibodies is equally the same in sheep and goats. The anibody titer for PPR virus antibodies in sheep and goats ranged from 1:2-1:8 (Table 1), only in 1.47% of Mixed breed sheep the titer reached 1:32. In this respect, Taylor (1979) and Ekue et al. (1992) reported antibody titer for PPR virus in sheep ranged from 0.6-1.5 and in goats from 0.6-0.9. Obi et al. (1984) reported that sheep has PPR virus antibody titer higher than goats.

Examination of the same sera samples of sheep and goats for antibodies against RP virus (Table 2) revealed that at 1:4 serum dilution the prevalence of RP virus antibodies was hihger in Barki sheep (12.28%) than in Mixed breed sheep (2.94%) and than goats (7.01%). In this respect, Zwart and Row (1966) found that 18.8% of sheep sera and 15.2% of goats contained antibodies to RP virus, Obi et al., (1984) reported higher prevalence of RP virus antibodies in sheep (19.5%) than in goats (6%).

Comparison of the percentages of the positive samples and the antibody titer for both viruses (Table, 1 & 2) revealed that the positive samples for PPR virus anitbodies in Mixed sheep breed (29.41%), Barki sheep (29.82%) and goats (29.82%) were higher than that for rinderpest virus antibody positive samples which was, 2.94% 12.28% and 7.01% for the two sheep breeds and goats respectively, This result indicated that PPR virus neutralizing antibodies are more pervalent than that of RP virus in sheep and gosts. This result conform that of Obi et al. (1984), Taylor (1979), Tawfik et al., (1989), Lefevre et al (1991) and Ekue et al (1992).

The results obtained in this study also agrees with that of Obi et al., (1984), Taylor and Abegunde (1979), in that there is some level of cross neutralization between PPR and RP virus antibodies and it is easy to distinguish the two viruses by titerating sera against both of them (Obi et al., 1964, Taylor, 1979).

Table 2: Serum neutralizing (SN) antibodies for RP virus in sheep and goats sera.

Species & breeds	Nr. of samples.	SN antibody titer									
		1:2		1:4		1:8		1:16		1:32	
		nr.	%	nr.	%	nr.	%	nr.	%	nr.	%
Mixed sheep	68	8	11.76	2	2.94	5	7.35	0	0	1	1.47
Barki Sheep	57	10	17.54	7	12.28	2	3.5	1	1.75	0	0
Goats	57	6	10.52	4	7.01	2	3.5	0	0	0	0

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