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DEVELOPMENT OF NEUTRALIZING ANTIBODIES AGAINST PESTE DES PETITS RUMINANT VIRUS IN SHEEP AND GOATS AFTER ITS VACCINATION WITH RINDERPEST VACCINE

(With Two Tabes)

By

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إستبيان المستوى المناعى ضد فيروس طاعون العترات الصغيرة فى الأغنام والماعز بعد تحصينها بلقاح الطاعون البقرى

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اختبر لقاح الطاعون البقرى النسيجى لتحصين الأغنام والماعز فى وسط وشمال المملكة العربية السعودية تم جمع عدد ٢٦٠عينة دم من الأغنام والماعز بعد تحصينها بلقاح الطاعون البقرى لم يلاحظ تأثير مخالف فى الأغنام والماعز المحصنة وتم قياس مستوى الأجسام المناعية ضد فيروس طاعون المجترات الصغيرة وثبت أن جميع الحيوانات المحصنة كونت أجسام مناعية كافية لصد المرض وتراوح معيار هذه الأجسام بين [LOG 10 0.3 - 1.0/ml] فى الأغنام بين [LOG 10 0.6 - 1.5/ml] فى الماعز .

SUMMARY

A lyophilized rinderpest vaccine experimental prepared from Kabete "O" attenuated strain was produced and tested for safety, purity, serological response and potency for use in Saudi Arabia under field condition. A total of 260 serum samples were collected from sheep and goat farms previously vaccinated with rinderpest vaccine. Neutralizing antibodies were determined against peste des petits ruminant virus (PPR). The vaccinated animals produced high protective level of neutralizing antiodies between [0.3 - 1.0 Log 10/ml] in sheep and [0.6 - 1.5 log 10/ml] in goats.

Key words: *Neutralizing antibodies against Pestedes petits ruminant virus*

INTRODUCTION

Peste des petits ruminant (PPR) is an acute or subacute contagious viral disease of goats and sheep. Mortality rate may range from 10 to 90% (Cottral, 1978). PPR virus is closely related antigenically and immunogenically to rinderpest virus. Rinderpest vaccine is very effective in immunization of sheep and goats against PPR virus (Tailor, 1979). The Veterinary Vaccine Center produced an experimental batch of rinderpest (RP) vaccine to be used to protect sheep and goats against PPR infection under field condition. Neutralizing antibody titres were determined in sera of sheep and goats after vaccination. This investigation was performed in the veterinary vaccine center production (saudi Arabia).

MATERIAL and METHODS

Vaccine:

Rinderpest vaccine Kabete "O" attenuated strain (PROK96) was produced in bovine kidney cells and evaluated according to the methods of Languet et al. (1985).

Samples:

260 sera samples were collected from two previously vaccinated sheep farms - one in Central and the other in Northern Saudi Arabia. Each animal was vaccinated S/C with 1 ml. of 1/50 of the RP vaccine (titer $10^{-5.1}$/ml.

$TCID_{50}$). All sera samples were inactivated at 56°C for 30 minutes before use.

Serum neutralization test:

The neutralization test with sheep and goats sera were undertaken in vero cells according to Tailor and Rowe (1984). A local strain of PPR virus was used as antigen confirmed by personal communication with pirbright laboratory (Anon, 1994) (confirmed by Pirbright in 1994). Cultures were examined daily for 7 days for the development of specific CPE. The results were evaluated using Spearman Karber method (Cottral, 1978).

RESULTS

Distribution of the unvaccinated and vaccinated animals and their seroneutralizing antibody titers are presented in Table 1 and 2. From the tables, it is noticed that anti-PPR seroneutralizing antibody titers were decreased in the unvaccinated animals from 0.7 to 0.3 (Log 10 SN_{50}) in the animals aged up to 8 months. In case of vaccinated animals more than 8 months of age, it is clear to note that titers of more than 0.3 were detected in 90% of samples.

DISCUSSION

The high level of sero conversion (90%) exhibited by the vaccinated sheep and goats indicated that RP vaccine proved to be an effective immunogen. Previously, Tayler (1979) and Asmar et al. (1980) suggested the possible use of Rinderpest (RP) vaccien to control PPR infection in sheep.

The maternal anti-PPR neutralizing antibodies declined at steady rate with time. At the 8^{th} month of age, a titer of 0.3 Log 10 SN_{50} was detected. The maternal antibodies remained and protected the neonatal animals up to 8 months of age. The vaccinated goats developed neutralizing anti-PPR antibodies higher than that of sheep. The period from 6 to 8 months of age may be considered a suitable time for vaccination of sheep and goats against PPR infection. These results are in agreement with Ata, et al. (1989), who said that maternal antibody titres in kids declined to a titre of 1 : 2 by the 17^{th} week of age.

In conclusion, RP vaccine proved to be safe in sheep and goats as well as active due to sero conversion point of view and consequently it will be efficacious offering resistance to the pathogenic original virus.

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Table-1. Distribution of anti-PPR seroneutralizing antibody titers (Log 10 SN_{50}) in vaccinated and non-vaccinated sheep.

Number of Sheep	Age	Vaccination History	Antibody Titer (Log 10 SN_{50})
20 animals	2 months	non-vaccinated	0.7
20 animals	4 months	non-vaccinated	0.7
20 animals	8 months	non-vaccinated	0.3
40 animals	10 months	at 2 months of age	0.7
20 animals	12 months	at 4 months of age	0.7
20 animals	22 months	at 6 months of age	0.3
20 animals	24 months	at 8 months of age	1.0
20 animals	28 months	at 18 months of age	1.0
20 animals	7 years	at 5.5 years of age	0.7
Total 200			

Table-2. Distribution of anti-PPR seroneutralizing antibody titers (Log 10 SN_{50}) in vaccinated and non-vaccinated goats.

Number of Sheep	Age	Vaccination History	Antibody Titer (Log 10 SN_{50})
30 animals	10 months	at 7 months of age	0.9
30 animals	9 months	at 6 months of age	1.5
Total 60			