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Immune Response of Rats to Peste Des Petits Ruminant (PPR) Vaccination

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Abstract


Rats were used as animal models to study immune response to vaccination with peste des petits ruminants (PPR) monospecific vaccine. One group (10 rats) was vaccinated with PPR vaccine (Nigeria 75/1). The second group (10 rats) served as unvaccinated control. Two weeks post vaccination, haemagglutination-inhibition (HI) test was done. The vaccinated group had higher HI titre of 6617±653 suggesting that the rats could be used for assessment of immune response to PPR vaccine.

Key words: PPR vaccine, haemagglutination-inhibition test, small ruminants.

Introduction

Peste des Petits Ruminants (PPR) is the greatest cause of morbidity and mortality of sheep and goat in West Africa and Middle East (Ozkul et al., 2002; Abdollahpour et al., 2006). Immunization is considered to be the most effective control measure for PPR. Significant degree of success in PPR prevention has been recorded with use of tissue culture Rinderpest vaccine and PPR monospecific homologous vaccine. Sometimes vaccine failures have also been reported (Bouniwell, 1980; Das et al., 2007). Thus, there is need to assess the immunocompetence of the animals and evaluate potency of the PPR vaccine. This work was designed to use rats as animal models to study immune response of animals to PPR vaccine.

Materials and Methods

Two groups of 10 albino rats each were used for the experiment. One group was vaccinated with one goat dose (1 ml) of a tissue culture PPR vaccine (Nigeria 75/1) from National Veterinary Research Institute, Vom, Nigeria. The second group was left unvaccinated to serve as control. Two weeks post vaccination, the rats were bled from the retrobulbar plexus for total leucocyte count and serum separation.
Equal volume of the reconstituted PPR vaccine and of a synthetic Aluminium-Magnesium Silicate (AMS) (12%) were mixed, incubated at room temperature for one hour, centrifuged and the supernatant used as the PPR haemagglutinin. Chicken red blood cells were prepared (Wosu, 1984). To remove non-specific haemagglutinins from the rats sera, the sera were adsorbed with concentrated goat RBC (Wosu, 1984). The sera so adsorbed were used as 1:2 dilution of the original sera. Fifty micro litres of PBS (pH: 6.8) was used to carry out serial double dilution of each serum. Then equal volume of 4 HAU of the prepared PPR haemagglutinins was added to each well. Then 50 µl of the 0.6% chicken RBC was added to each well. The set up was left at 4°C overnight and then read. Mean HI titre was calculated for each group of rats and the difference in the two means evaluated by students t-test.

**Results and Discussion**

A mean HI titre of 6617±653.24 in vaccinated rats and 11.2±4.17 in the control group (P<0.05) suggested that PPR vaccination provoked humoral immune response. The low HI titre in the unvaccinated group might have resulted from infection of the control rats through inhalation since the two groups of rats were housed in the same room. This could also be attributed to non-specific reaction of HI test.

The vaccinated group had a higher mean lymphocyte count of 82.40±1.43 per cent than the unvaccinated group which had a mean of 76.80±8.64 per cent, which was not significantly different (P>0.05). This suggests that immune response to PPR might not have much of cell mediated immunity.

Sinnathamby *et al.* (2001) suggested that cell mediated immunity may be important in PPR only when there is absence of neutralizing antibodies. They demonstrated that immune response to PPR virus is targeted against the haemagglutinin-neuraminidase glycoprotein. So immune status of sheep and goats before and after vaccination with PPR vaccine may be assessed by the haemagglutination-inhibition test. Such assessment of extent to which immunization has been effective can be a guide to small ruminant practitioners to know when to revaccinate their animals. Vaccines can also be evaluated for potency by their ability to stimulate HI-antibodies. This assay can also be used for serological survey of small ruminants in order to assess seroprevalence rate.

**References**


