

IMMUNIZATION OF SWINE AGAINST LEPTOSPIRA INTERROGANS
 SEROVAR TARASSOVI INFECTION.
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Vaccination of swine is generally accepted as an effective method of protection against clinical leptospirosis. The evaluation of immunity of vaccinated animals creates problems. A direct challenge is the best method but requires virulent strains to reproduce clinical signs of disease, and is very expensive. Indirectly the evaluation of the immunity can be based on the presence of protective antibodies in sera from vaccinated animals, detectable in hamster passive protection test /1,2,3/, or growth inhibition test /4,5/. The latter test requires strains pathogenic for hamster and is expensive. Present experiment was undertaken to evaluate the experimental tarassovi bacterin, and establish correlation between level of growth-inhibiting and agglutinating antibodies in vaccinated sows, and their resistance to contact infection with serovar tarassovi.

Materials and methods.

Animals. Thirty eight sows 6 months old, from the farm without history of leptospirosis were used. Sera from these animals were negative when tested with the MA and GI tests, using tarassovi, pomona, grippotyphosa and icterohaemorrhagiae antigens.

Bacterin. The culture of *L. interrogans* serovar tarassovi containing 10^8 organisms/ml was inactivated with 0.2% of formalin and 10% of aluminium hydroxide was added.

Immunization of sows. Nineteen animals were vaccinated twice subcutaneously with 5.0ml of the bacterin, with two-week interval between injections. The remaining 19 sows were nonvaccinated controls. Two weeks after vaccination both groups were introduced into herd of pigs with current tarassovi infection and covered. During six-month period animals were observed for clinical signs of leptospirosis. Blood samples for antibody measurement were collected 1, 3, 5 and 6 months after vaccination.

Microscopic agglutination test. Two-fold dilutions of sera were made in p.saline. Each dilution/0.2ml/was mixed with equal volume of 7 - 10 day old culture of tarassovi, incubated at 30°C for 2h and the result was read under dark-field microscopy.

Growth inhibition test. Two-fold dilutions of sera were made in duplicate, in Korthof broth starting from 1:10. Each tube containing 5.0ml of dilution was then inoculated with 0.1ml of actively growing culture of tarassovi, containing approximately 10^8 organisms/ml, incubated at 30°C for two weeks, and examined grossly for growth. The tubes with no turbidity were considered positive for the antibody.

Results.

Clinical signs of leptospirosis were not observed in the group of the vaccinated sows introduced into the infected herd. The immunization stimulated significant antibody response. One month after vaccination the MA antibodies were demonstrated in sera from all sows with mean titer 1:117. The titer decreased to 1:7.7 and 1:6.8 on the 3rd and 5th month respectively. Six months after vaccination only 10 of 19 /52.6%/ immunized sows had detectable MA antibodies, and mean titer was 1:4. The GI antibodies did persist through the test period in the sera from

all immune animals. One month after vaccination the mean titer was 1:109 and then decreased to 1:73 and 1:30 on 3rd and 5th month respectively. Six months after immunization GI antibodies were demonstrated in all sows and mean GI titer was 1:18.

In the control group clinical signs of the disease were observed: 4 of 19 sows delivered litters with fetal deaths. Also serological evidence of the infection was demonstrated. One month after the sows were introduced into the infected herd, MA antibodies were detected in sera from 8 of 19 animals and mean titer was 1:14. Then the titer increased to 1:68 and 1:157 on the 3rd and 5th month respectively. After six months the mean MA titer reached value 1:733 and all sera tested were positive.

Discussion.

Growth inhibition test was used by other workers /4,5/ to evaluate the immune response after vaccination with pomona, hardjo and grippotyphosa bacterins. In the earlier studies /Nowakowski, in press/ author demonstrated relationship between protection of dogs against challenge inoculation, one year after vaccination with icterohaemorrhagiae bacterin, and the level of protective antibodies as determined by hamster protection test and growth inhibition test. The results of the present experiment indicated that sows vaccinated with tarassovi bacterin were resistant to the infection and sera collected from all immune animals six months after vaccination had GI titers from 1:10 to 1:40. These results also indicated that levels of GI antibodies correlated positively with the protection of sows against clinical leptospirosis and that GI test can be used to determine the immune status of swine vaccinated with tarassovi bacterin. Six months after vaccination agglutinins were detected only in 52.6% of the immunized animals with low mean titer of 1:4. This confirms other reports that MA test cannot be used for the evaluation of the immunity of the vaccinated animals.

Conclusions:

1. Sows immunized with the experimental tarassovi bacterin were resistant to infection for at least six months.
2. Six months after vaccination GI antibodies were present in sera from all sows, while only 10 of 19 animals had low titers of the agglutinins.
3. Growth inhibition test can be used to evaluate the immunity of swine against tarassovi infection.

Selected references:

1. Huhn, R. G., Hanson, L. I., Killinger, A. H., Cardella, M. A., Am. J. Vet. Res. 36:59, 1975.
2. Morsi, H. M., Shibley, G. P., Strother, H. L., Am. J. Vet. Res. 34:1253, 1973.
3. Negi, S. K., Myers, W. L., Segre, D., Am. J. Vet. Res. 32: 1915, 1971.
4. Tripathy, D. N., Hanson, L. E., Mansfield, M. E., In Proceedings. 77th Ann. Meet. US Anim. Health Assoc., 1973, 113.
5. Tripathy, D. N., Smith, A. R., Hanson, L. E., Am. J. Vet. Res. 36:1735, 1975.