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Characterization of the Immune Response of Inactivated RVF Vaccine: A Comparative Study in Sheep and Goats as Experimental Model

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Abstract : Rift Valley Fever is an economically specific disease of the health and arboviral disease that affects many types of animals, causing significant economic losses in livestock, and it is transmitted to humans and has public health issues. The vaccine program is the backbone for the control of this disease. The goal of this study was to apply a new approach to evaluate the inactivated RVF vaccine developed in Egypt. In this study, the RVF vaccine was evaluated in young puppies and compared with sheep; the findings showed that young puppies were susceptible to infection with the inhibitory RVF virus and had a strong response of antibodies with two doses of the RVF vaccine within the two-week interval. The neutralization indices began to appear to the protective level on the 7th day at 1.35 and steadily elevated at 14,21 and 28 days to 1.35, 1.43, and 1.20, respectively, in comparison to the control group. While in sheep, the neutralization indices began to appear to the protective level on the 7th day at 1.10 and remain strongly at high titer at 14, 21, and 28 days with NI values 1.20, 1.50, and 1.50, respectively. The new approach for comparing the immune response in puppies and sheep via SNT indicated the high response in both species was evident as well as the neutralization indices values in young puppies at different periods after RVF vaccination reported the value of 1.08±0.03, 1.23±0.04, 1.30±0.03, and 1.45±0.02 after 7, 14, 21, and 28 days post-vaccination respectively. On the other side, a nearly similar immune response was noticed in sheep with NI values of 1.15±0.02, 1.27±0.02, 1.42±0.05, and 1.55±0.03 at 7, 14, 21, and 28 days post-vaccination, respectively. In conclusion, young puppies are similar to sheep in developing antibodies after vaccination with the RVF vaccine and can replace sheep for evaluating the efficacy of the RVF vaccine. Further studies are mandatory to assess more recent methods for evaluating inhibition of the RVF vaccine.

Keywords : immune response, puppies, RVF, sheep, vaccine
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