RiVax™ is a plant-based vaccine that, when inhaled in sufficient quantities, causes a rapid proliferative respiratory syndrome that can result in death. A vaccine derived from the A-chain moiety of ricin (RiVax™) has been developed by using conventional aluminum adjuvant, lyophilized in conjunction with glassifying reconstituted with Water for Injection. NHPs were exposed to an aerosolized ricin (~3 x LD50) 45 days after the last vaccination. In the first of two cohorts of six NHPs each, all of the NHPs in the vaccinated group survived; one NHP was euthanized on the 7th day post-vaccination; a delayed death was atypical in this model. It was hypothesized that death was due to a secondary bacterial infection unrelated to ricin exposure; pathology was pending. All NHPs in both control groups died within ~36 hours of exposure, including characteristic hemorrhage and edema. All of the vaccinated NHPs developed ELISA-reactive antibodies after two vaccinations and toxin-neutralizing antibodies after the third vaccination. Previous studies with this lyophilization technology have demonstrated that the RiVax™ vaccine is stable for at least 12 months at 40°C and the retained potency is similar in NHPs and humans.

BACKGROUND

Ricin, a potent toxin capable of being weaponized, has well documented toxicity. It is known to be lethal by the aerosol route, resulting in epithelial damage, including characteristic hemorrhage and edema. All of the vaccinated NHPs developed ELISA-reactive antibodies after two vaccinations and toxin-neutralizing antibodies after the third vaccination. Previous studies with this lyophilization technology have demonstrated that the RiVax™ vaccine is stable for at least 12 months at 40°C and the retained potency is similar in NHPs and humans.

RESULTS

Survival: RiVax™-TR against Aerosolized Ricin

Significantly Less Lung Damage in Vaccinated Animals by Histology

CONCLUSIONS

RiVax™-TR was 100% (11/11) efficacious in the NHP primate model of lethal aerosolized ricin toxin.

RAC antibodies were significantly increased after 2 vaccinations while neutralizing antibodies were consistently elevated after 3 vaccinations.

The epitope profile of the neutralizing antibody response was similar in NHPs against ricin.

References

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Thermostable Subunit Vaccine Results in Protective Immunity in Rhesus Macaques in an Inhalational Ricin Model

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