
Immunization Dialogue

Rabies Vaccination

Q. Ten doses of sheep brain derived anti rabies vaccine were given to a 10 years old boy with Class II bite by a stray dog. Can Vero cell or purified chick embryo vaccine be given to that child 10 days after the above dosage? Will there be any cross reaction or reduction in antigenic response?

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A. Under ordinary circumstances, there should be no reason to give more doses of cell culture-derived rabies vaccine to a child who was already given 10 doses of the sheep-brain rabies vaccine. If the sheep-brain vaccine was inactivated with beta propiolactone instead of phenol, the antigenicity of rabies virus is better preserved, and 7 to 10 doses would be sufficient for post-exposure prophylaxis. However, let me answer the specific question about the immunogenicity of cell culture-derived rabies vaccine in subjects previously inoculated with the sheep-brain vaccine.

The antigen which stimulates the production of virus-neutralizing antibody is the surface glycoprotein G of the rabies virus. The G protein antigen present on the killed rabies virus particles is one and the same irrespective of the substrate in which the virus was grown prior to inactivation or purification and inactivation. In the case of sheep-brain vaccine, the virus is grown in the brain tissue; a 5 or 10% brain suspension (after virus inactivation by beta propiolactone) is the final product. In the

case of cell-culture vaccines, the virus is grown in the cell culture (such as vero cells or chick embryo fibroblast cells or human diploid fibroblast cells), purified and inactivated. In my laboratory we have investigated and found that Cell-culture vaccine acts as an excellent booster stimulus in subjects previously inoculated with sheep-brain vaccine.

Having answered the specific question I must add that I do not approve of the continued use of sheep-brain vaccine which is not a safe vaccine, although it is an effective vaccine. Safe cell culture vaccines have been developed about 2 decades ago and it is shameful for a country like India, with such scientific talent and technological expertise, not to have progressed with the times. In my personal opinion it is unethical to give sheep-brain suspension to humans by injection. It can cause severe allergic encephalomyelitis which can even be fatal, in an occasional subject. If the Government which subsidises the production of sheep-brain vaccine began to subsidise the production of cell-culture rabies vaccine, we could by now have had safe rabies vaccine at affordable prices.

Today there is one manufacturer in India, producing cell culture rabies vaccine, but the basic raw material of "specific pathogen free" (SPF) eggs are in short supply and relatively expensive.

A second manufacturing unit was almost made under public sector, but the government decided to abort the project. I understand that this project was started in 1987 with assistance from France. The technology was based on micro carrier grown vero cells, an excellent substrate in which to grow rabies virus. This technology

would have enabled India to produce large amounts of rabies vaccine, as well as live measles virus vaccine and inactivated polio vaccine. I believe that the fee for technology transfer was the contribution of the French government. I understand that the Government of India met the capital costs of the buildings. Then, in 1993, apparently, the project was abandoned at the decision of the Government of India. Both the investing partners, namely the Governments of France and India did invest funds, to the best of my knowledge, but the project was not allowed to fructify for reasons not clear to me.

Who is to decide whether it is ethical to

continue to use animal-brain rabies vaccine in India? How can we, as individuals and as the Indian Academy of Pediatrics prevail upon the government to make available safe rabies vaccines at affordable prices? These are still weighing on my mind and I do hope that we will get an opportunity to be heard, either by the new government or by the judiciary, in the not-too-far future.

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