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Editorial

Ebola Vaccines: An Update

Attapon Cheepsattayakorn[1,2]* and Ruangrong Cheepsattayakorn[3]

[1]10th Zonal Tuberculosis and Chest Disease Center, Chiang Mai, Thailand
[2]5th Office of Disease Prevention and Control, Ratchaburi, Department of Disease Control, Ministry of Public Health, Thailand
[3]Department of Pathology, Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

***Corresponding Author:** Attapon Cheepsattayakorn, 10th Zonal Tuberculosis and Chest Disease Center, 143 Sridornchai Road Changklan Muang Chiang Mai 50100 Thailand.

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The experimental vaccine was studied and given in 2015 people in Guinea who were in contact with confirmed cases of Ebola disease. After a few months of trials, the World Health Organization said that the preliminary results were an "extremely promising development ". Ebola-virus-disease survivors demonstrated significant higher and more rapid induction of virus-specific immunoglobulin (Ig) M response, a protective role against Ebola virus, compared to nonsurvivors. Monoclonal antibodies isolated from the patients can neutralize Ebola virus *in vitro* and revealed passive transfer of monoclonal antibodies conferred pre- and post-exposure protection against Ebola virus in different animal models. Although DNA vaccine-induced protection in murine models was associated with high tier glycoprotein-specific IgG antibodies, passive transfer of hyperimmune sera did not protect naïve. However, IgG antibody titer to virus glycoprotein provided a quantitative correlate of protection following vaccination. This correlation between survival and the high titer IgG antibodies pre-challenge was demonstrated with Ebola vaccines based on rAd5-DNA, rAd5, replicating vesicular stomatitis virus (rVSV), and virus-liked particles (VLPs) encoding Ebola virus glycoprotein both in murine and nonhuman primate models. Thus, IgG antibodies to the Ebola virus glycoprotein measured by enzyme-linked immunosorbent assay (ELISA) are currently the best available quantitative correlate of protection. Adoptive transfer of Ebola virus nucleoprotein-specific CD8+ T cells in mice was able to protect naïve mice against lethal viral infection. This indicates that cellular immune responses also play an important role in mediating viral protection.

preclinical development of a variety of different platforms, including recombinant viral vectors, DNA vaccines, VLPs, subunit proteins, recombinant simian adenovirus vectors, non-replicating vaccinia virus vectors, replicating vesicular stomatitis virus vector, recombinant human adenovirus vectors, and recombinant proteins. Eight vaccines in clinical trials have been targeted on the Ebola virus glycoprotein, but differing in the predominant immune response induced, vaccine reactogenicity, and the manner in which the antigen is delivered. Nevertheless, any vaccines have not yet been approved by any regulatory authority, but it is considered much effective that an emergency stockpile of 300,000 doses has already been created for use should an Ebola-virus-disease outbreak flare up again.

In conclusions, the field of Ebola vaccine development has advanced at an exponential rate with multiple candidate vaccines in advanced stages of clinical development. Several trials being undertaken in Africa, USA, and Europe have already demonstrated that most of these vaccines are well-tolerated and safe. A single dose of rVSV and high dose of ChAd3. EBOZ can generate putative protective antibody titers although a human correlation of protection remains unknown.

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