Respiratory syncytial virus vaccine mRNA lipid nanoparticles pattern determined via bioinformatics

Mohammed Kassab¹

¹Cairo University Department of Microbiology and Immunology

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Abstract

Background: RSV, or respiratory syncytial virus, is a deadly condition that is present all over the world today. Without systemic transmission, the infection is initially contained to the lower respiratory tract. The objective of the study: Bioinformatics was used in Egypt to create an mRNA vaccine against the Respiratory syncytial virus (RSV). Methodology: In the present screening experimental study, lipid nanoparticles vaccine of mRNA of surface fusion protein of Respiratory syncytial virus was manufactured. The present vaccine delivery system was lipid nanoparticles with particle size approximately 90 nanometre which were manufactured by hot micro-emulsion method. In stages 1 and 2 of clinical trials, the immunogenicity of the current mRNA RSV vaccine was evaluated. Results: The current vaccine demonstrated 81% immunogenicity in animal testing, but only 69% in stages 1 and 2 of clinical trials. Its side effects were manageable. The results persisted for a while. In the current trial, the vaccination proved effective as a preventative measure against RSV infection. The current vaccination lacked antibody-dependent enhancement, which causes non-protective antibodies to develop. These non neutralizing antibodies exacerbate infection by the activation of cytokines and complement cascade through the formation of immune complexes or enhancement of the virus entry and replication in the host cells. On the other hand, the current RSV mRNA vaccine of the surface fusion protein consequent on production of powerful neutralizing antibodies with prolonged immunity especially to infants and elderly candidates whom received the optimal dosage regimen.

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