SARS-CoV-2 mRNA-1273 vaccine shows signs of potential efficacy

mRNA-1273 vaccine is a novel lipid nanoparticle (LNP)-encapsulated mRNA-based vaccine that encodes for a full-length, prefusion stabilized spike (S) protein of SARS-CoV-2 COVID-19 vaccine candidate co-developed by Moderna and Vaccine Research Centre based at the US-National Institutes of Health. On the 16th of November, Moderna released a press statement stating that “NIH-appointed Data Safety Monitoring Board (DSMB) for the Phase 3 study of mRNA-1273 has informed Moderna that the trial has met the statistical criteria pre-specified in the study protocol for efficacy, with a vaccine efficacy of 94.5% (p < 0.0001).” Interim analysis on 95 cases [90 (placebo group) and 5 (mRNA-1273 group)] of which 11 were severe cases all from the placebo group.

What immunogenicity evidence do we have for the vaccine thus far? Pre-clinical studies have demonstrated safety and immunogenicity of the vaccine in mice and non-human primates (Corbett et al., 2020; Corbett et al., 2020). NHP pre-clinical studies showed that vaccination with 100ug compared with 10ug dose resulted in superior humeral and cellular (Th1 and Tfh) immunity. Further vaccine-induced immunity which prevented the acquisition of SARS-Cov-2 after challenging (n=7/8).

Preliminary report of their Phase 1 Clinical trial demonstrated that vaccination with mRNA-1273 did not result in severe side-effects, however, the frequency of side effects correlated with vaccine antigen concentration (Jackson et al., 2020). Vaccination induced rapid seroconversion, within 15 days of the first vaccination dose and induced robust neutralising antibody titres and spike-protein-specific CD4 Th1 cells responses. Further, they also showed that the vaccine is safe and immunogenic in older (>55 years old) adults inducing similar magnitude of immunity as in younger adults (Anderson et al., 2020).

Moderna also announced that the vaccine has a longer-shelf than previously reported and can remain stable for up to 30 days at standard refrigerator temperatures of 2° to 8°C. This is good news as many low resourced clinical settings may not have access to -20°C freezers which was the recommended (> 7 days) storage temperature.

Press Release: Moderna’s COVID-19 Vaccine Candidate Meets its Primary Efficacy Endpoint in the First Interim Analysis of the Phase 3 COVE Study

Corbett et al., 2020. Evaluation of the mRNA-1273 Vaccine against SARS-CoV-2 in Nonhuman
Primates. NEJM

Also read our other articles about mRNA-1273:

- Safety and immunogenicity of the SARS-CoV-2 mRNA-1273 vaccine candidate in older age.
- NIH COVID-19 lecture on SARS-CoV-2 mRNA vaccine
- mRNA Vaccine against SARS-CoV-2 induces robust Ab responses
- Potential SARS-CoV-2 & COVID-19 Vaccines