COVID-19 Evidence Digest 02/12/21

Safety and efficacy of an rAd26 and rAd5 vector-based heterologous prime-boost COVID-19 vaccine: an interim analysis of a randomised controlled phase 3 trial in Russia (Lancet)

Bottom Line: The results of an interim, double-blind, randomized control phase 3 trial of the rAd26 and rAd5 vaccine developed in Russia suggested promising effectiveness against COVID-19.

Details: This was an interim, double-blind, randomized control phase 3 trial of an adenovirus vaccine in Moscow, Russia from September 7 to November 24, 2020. Adults (n = 21,977) aged 18 or older were randomly assigned to receive either the vaccine or a placebo in two doses with the second dose given 21 days after the first one. 16,501 participants received the vaccine and 5,476 participants received the placebo. Of all of the participants, 19,866 received both doses of the vaccine and were included in the analysis. Results presented in this study were only 21 days after the first dose. After 21 days of receiving the first dose, 0.1% of those who received the vaccine had COVID-19 compared to 1.3% of those who received the placebo. The vaccine was determined to have 91.6% efficacy. 0.3% of those who received the vaccine had adverse events compared to 0.4% of those who received the placebo. The most common adverse events were flu-like symptoms, injection site reaction, headache, and asthenia (weakness and/or lack of energy). Three deaths in the vaccine group and one in the placebo group were reported. No adverse events or death were considered to be due to the vaccine.

Key Takeaways:

- The rAd26 and rAd5 vaccine is 91.6% effective in preventing COVID-19 after just the first dose and is currently approved for use in Russia by the Ministry of Health.
- Further research is needed to better understand the effectiveness of just a single dose vaccine.

Inhaled budesonide in the treatment of early COVID-19 illness: a randomised controlled trial (MedRxIV)

Bottom Line: Twice-daily inhaled budesonide for patients within 7 days of symptoms from mild COVID-19 infection is associated with 90% relative risk reduction in urgent care visits, ED visits or hospitalizations.

Details:

A randomized-control trial included 146 adults aged 18 or older with symptoms suggestive of mild COVID-19 that began within 7 days. Patients were randomized to receive either a budesonide dry powder inhaler at 800 micrograms twice a day or usual care. Patients recorded daily symptoms, measured their temperature every day and checked pulse oximeter levels. Participants completed nasopharyngeal swabs for SARS-CoV-2 viral load testing at day 0, day 7, and day 14. Budesonide was stopped when symptoms resolved.

Primary outcomes included an urgent care visit related to COVID-19, ED visit, or hospitalization. Secondary outcomes included patient-reported time to symptom resolution, score on two standardized viral symptom questionnaires, pulse oximeter readings, temperature, and SARS-

CoV-2 viral load. ANCOVA models were used to assess continuous variables while chi-square testing was used for categorical variables. Kaplan Meier method was used to assess symptom recovery.

Inhaled budesonide demonstrated a 90% relative risk reduction of urgent care, ED, or hospitalization when compared to individuals who received usual care. Patient-reported clinical recovery time was shorter in patients with confirmed COVID-19 who received budesonide when compared to those receiving usual care. No difference was seen in the proportion of days with a documented fever, proportion of days with O_2 saturation less than 94%, or median cycle threshold for nasopharyngeal SARS-CoV-2 viral load testing between individuals receiving budesonide and those receiving usual care.

Key Takeaways:

- Inhaled budesonide decreases risk of urgent care visits, ED visit or hospitalization among individuals with mild COVID-19 infection.

- Inhaled budesonide decreases length of symptoms among individuals with mild COVID-19 infection.

Robust spike antibody responses and increased reactogenicity in seropositive individuals after a single dose of SARS-CoV-2 mRNA vaccine (MedRxIV)

Bottom Line: The immune response after natural infection with COVID-19 is adequate that these individuals could potentially receive only 1 dose of COVID-19 vaccine without compromising their antibody levels.

Details: 68 individuals without antibody evidence of SARS-CoV-2 antibodies (antibody negative) and 41 individuals with antibodies (antibody positive) were evaluated after receiving their first mRNA vaccine dose. Antibody negative individuals required 2 doses of vaccine to achieve adequate vaccine titers, however antibody positive individuals rapidly developed high levels of antibodies within days of the first dose of vaccine. The antibody titers of individuals who were antibody positive prior to vaccination were 10-20 times higher than those who were antibody negative prior to vaccination ($p < 0.001$). In addition, individuals who were antibody positive prior to vaccination were more likely to report systemic symptoms (headache, chills, fever, muscle pain, joint pain, and fatigue) after the first dose of vaccine as compared to antibody negative individuals ($p < 0.001$).

Key Takeaways:

- Individuals with antibodies to SARS-CoV-2 prior to vaccination have a rapid and robust immune response within days of the first dose of mRNA vaccine.

- These individuals are also more likely to report systemic symptoms after the first dose of mRNA COVID-19 vaccine and have antibody levels 10-20 times higher than those without antibodies prior to vaccination.