COVID-19 Evidence Digest 04/30/21

NYC HEALTH + HOSPITALS | POPULATION HEALTH

Preliminary Findings of mRNA COVID-19 Vaccine Safety in Pregnant Persons (NEJM)

Bottom Line: Early studies do not show increased local and systemic reactogenicity or adverse events among pregnant persons when compared to non-pregnant women who received the vaccine. No differences were found in rate of adverse pregnancy and neonatal outcomes in pregnant persons receiving the COVID-19 vaccine and evidence from peer reviewed studies.

Details: Pregnant persons were excluded in preauthorization clinical trials for the Pfizer-BioNTech and Moderna mRNA COVID-19 vaccines, yet pregnant persons are at increased risk of severe illness and death from COVID-19 infection. After weighing risks and benefits, national clinical organizations have recommended that COVID-19 vaccine should not be withheld from pregnant persons.

The CDC developed v-safe, a smartphone-based application that allows participants to complete online surveys assessing local and systemic signs/symptoms, adverse reactions, and health status up to 12 months after COVID-19 vaccination. Persons participating in v-safe who identified as pregnant were consented and enrolled in the v-safe pregnancy registry. Persons aged 18 or older who received vaccination during pregnancy or peri-conception period were eligible. Enrolled participants provided additional medical and obstetric history while infants are followed through three months of age. Vaccine Adverse Event Reporting System (VAERS) is a national surveillance system governed by the CDC and FDA that receives reports on adverse events after vaccination. Researchers identified reports submitted about pregnant persons.

Researchers compared local and systemic reactogenicity the day after Pfizer-BioNTech or Moderna vaccination of all pregnant persons aged 16 to 54 with completed pregnancies to those outcomes in non-pregnant women aged 16 to 54. Pregnancy loss and neonatal outcomes were reported. VAERS data measured adverse events in pregnancy and neonatal outcomes as well as in non-pregnancy.

Among v-safe participants, 35,691 were identified as pregnant. Most participants were pregnant at time of vaccination. Overall, the most frequently reported solicited reactions and increased reporting or reactogenicity after dose two were similar among pregnant persons and non-pregnant women. Pregnant persons did not report having severe reactions more frequently than non-pregnant women, except slightly increased rates of nausea and vomiting after the second vaccine dose. Among participants, 3,958 provided information about pregnancy and neonatal outcomes. The calculated proportions of pregnancy and neonatal outcomes appeared similar to incidences published in peer-reviewed literature. VAERS analyzes 221 reports involving COVID-19 vaccination in pregnant persons. 70% of these events were non-pregnancy events.

Key Takeaways:

- Early studies do not show increased local and systemic reactogenicity or adverse events among pregnant persons when compared to non-pregnant women who received the vaccine, which supports that pregnant persons should be offered COVID-19 vaccination.

Vaccine Breakthrough Infections with SARS-CoV-2 Variants (NEJM)

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Bottom Line: In this cohort study of 417 individuals, there were two women with COVID-19 breakthrough infections diagnosed more than two weeks after their second dose of either Pfizer-BioNTech (BNT162b2) or Moderna (mRNA-1273).

Details: This cohort study comprised 417 employees and students from Rockefeller University campus who received their second dose of Pfizer-BioNTech (BNT162b2) or Moderna (mRNA-1273) at least two weeks prior and were tested for COVID-19 between January 21 and March 17, 2021 in accordance with NY State regulations for eligibility. Testing occurred weekly and viral load calculation, neutralization assays and targeted and whole viral sequencing was completed. Patient histories were taken for those who tested positive. Two fully vaccinated women had subsequent COVID-19 breakthrough infections.

Patient 1 was a 51 year-old healthy woman, who developed flu like muscle aches ten hours after her second vaccine dose. She tested positive 19 days later, with congestion, headache, sore throat and lost sense of smell. Symptoms gradually resolved over one week.

Patient 2 was a 65 year-old healthy woman with pain in her arm for two days following her second vaccine dose. She tested positive 30 days after completing vaccination and 13 days after her unvaccinated partner tested positive. She experienced symptoms of fatigue, sinus congestion and a headache, which began to resolve within 4 days.

Both patients were infected with virus variants. Further analysis of patient 1 serum, noted the variant was distinct from B.1.1.7 (identified first in the United Kingdom) and B.1.526 (identified first in New York City). The neutralization assay noted an antibody response but that it was insufficient to prevent infection. These findings support the need to maintain mitigation strategies, testing of asymptomatic individuals and rapid virus sequencing as the population continues to be vaccinated.

Key Takeaways:

- Breakthrough infections are possible after successful vaccination.
- A total of two women out 417 individuals in this study, had symptomatic COVID-19 breakthrough infections diagnosed more than two weeks after their second dose of either Pfizer-BioNTech (BNT162b2) or Moderna (mRNA-1273).
- Findings support the need to maintain mitigation strategies, testing of asymptomatic individuals and rapid virus sequencing as the population continues to be vaccinated.

Safety and Efficacy of Single-Dose Ad26.COV2.S Vaccine against COVID-19 (NEJM)

Bottom Line: A single dose of Ad26.COV2.S (Johnson & Johnson) protected against moderate-critical COVID-19, with similar safety to previous phase three trials of COVID-19 vaccines.

Details: In this phase three randomized, double-blinded, placebo-controlled trial, adult participants were randomly assigned 1:1 to either receive a single dose of Ad26.COV2.S or placebo. The primary endpoints were vaccine efficacy against moderate to severe COVID-19 at least 14 days after administration, and at least 28 days after administration in the per-protocol population. A total of 44,325 participants were randomized, and 39,321 participants were included in the per-protocol population (participants who received a dose of trial vaccine or

placebo, were seronegative or had an unknown serostatus at the time that the vaccine or placebo was administered, and had no protocol deviations that were likely to affect vaccine efficacy). Ad26.COV2.S protected against moderate to severe COVID-19 with onset at least 14 days after administration (116 cases in the vaccine group vs. 348 placebo; efficacy 66.9% [95% CI, 59.0-73.4]) and at least 28 days after administration (66 vs. 193 cases; efficacy 66.1% [95% CI, 55.0-74.8]). Vaccine efficacy was higher against severe COVID-19 (efficacy 76.7% [95% CI, 54.6-89.1] for onset at ≥14 days and 85.4% [95% CI, 54.2-96.9] for onset at ≥28 days). Reactogenicity was higher with Ad26.COV2.S than with placebo but was generally mild to moderate and transient. The incidence of serious adverse events was balanced between the two groups.

Key Takeaways:

- The single dose Ad26.COV2.S (Johnson & Johnson) protected against moderate-severe COVID-19 with 66% efficacy.
- The vaccine had higher efficacy at protecting against severe COVID-19.
- Safety of the vaccine was similar to phase three trials of other COVID-19 vaccines.