COVID-19 Vaccine for Children

Safety/Side Effects of mRNA Vaccine vs Dangers of COVID-19/MIS-C

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mRNA COVID-19 Vaccines & Children

- Pfizer-BioNTech COVID-19 vaccine received Emergent Use Authorization for use in Children 12 years and older: May 10, 2021
- CDC (7-7-21)
  - CDC recommends everyone ages 12 and older get vaccinated ASAP to help protect against COVID-19 and related, potentially severe complications
- AAP
  - Recommends COVID-19 vaccination for all children and adolescents 12 years of age and older who do not have contraindications
  - Supports coadministration of routine childhood and adolescent immunizations with COVID-19 vaccines for children and adolescents who are behind or due for routine immunizations

mRNA COVID-19 Vaccines & Children

- Pfizer-BioNTech COVID-19 vaccine received Emergent Use Authorization for use in Children 12 years and older: May 10, 2021
  - Statewide:
    - 28.9% of children 12-15 have had 1 vaccine dose
    - 24.2% of children 12-15 have completed vaccination

Safety of mRNA COVID-19 Vaccines

- Serious Adverse events of interest
  - Anaphylaxis: rare; 2-5 per million vaccinated in US
  - **Myocarditis and Pericarditis**: rare
    - As of 7-6-21, **971** cases of myocarditis or pericarditis in patients 30 years old and younger **reported to** Vaccine Adverse Event Reporting System (**VAERS**)
    - Most associated with mRNA vaccines
      - 594 cases confirmed by CDC and FDA
    - Incidence:
      - Males:
        - 67/Million 2nd doses: 12-17 yrs old
        - 56/Million 2nd doses: 18-24 yrs old
        - 20/Million 2nd doses: 25-29 yrs old
      - Females: 9, 6, and 3, respectively.

Myocarditis and Pericarditis following mRNA COVID-19 Vaccination

- Confirmed cases
  - Mostly male adolescents & young adults
  - More often after 2nd dose than 1st dose
  - Typically within several days post mRNA vaccination
- Symptoms:
  - Chest Pain; Shortness of Breath; Palpitations.
  - Elevated cardiac enzymes, ST or T wave changes, and abnormal ECHO findings
- Most patients who require care respond well
- Patients can resume normal daily activities
  - Return to sports or exercise requires physician clearance
- CDC/AAP Recommendation: Cardiac risk of COVID-19 more severe

COVID-19 Risks

- Acute Infection
  - Hospitalization
  - Mortality
- Subacute/Post-Infection
  - Multisystem Inflammatory Syndrome in Childhood (MIS-C)
  - Long COVID

Multisystem Inflammatory Syndrome in Childhood (MIS-C)

- In April 2020, first temporal association between infection with SARS-CoV-2 and MIS-C
  - A post-infectious complication occurring 2-6 weeks after acute SARS-CoV-2 infection
  - Symptoms:
    - Persistent Fever
    - Systemic Sx [Abdominal pain, Vomiting, Headache, Fatigue]
  - Signs: Conjunctival hyperemia and rash
  - Severe Cardiovascular involvement:
    - Multiorgan failure with **shock**
    - ECHO findings: decreased LV function & coronary artery aneurysms
    - Need for inotropic support, ventilatory support, rarely ECMO

Multisystem Inflammatory Syndrome in Childhood (MIS-C)

- Laboratory findings
  - Elevated C-reactive protein and ferritin
  - Cardiac markers: elevated troponin and N-terminal pro-B-type natriuretic peptide
  - Hematologic: Low Platelets, Hgb, and Lymphocytes
- Clinical Impact
  - Early reports: 60% inotropic support, 53% Myocarditis, 80% required ICU
  - US Data (DeBiasi RL, *NEJM*, July 1, 2021)
    - 4000 cases with 35 deaths
  - MI Data (April ‘20-July 1, ‘21) [MDHHS]
    - 155 cases and fewer than 5 deaths; 70% in ICU

Long COVID

- Most patients infected with COVID recover completely but some have lingering symptoms
  - Symptoms include: Fatigue, Headaches, Difficulty concentrating, Palpitations, Insomnia, & Loss of smell
  - Initial pediatric data from the UK Office of National Statistics*
    - **10%** of children **2-11** years old and **15%** of children **12-16** years old **still have symptoms 5 weeks post infection**
    - This 10-15% with persistent symptoms occur irrespective of disease severity at onset.
    - By contrast, adults 35-69 years old: 25% have Sxs 5 weeks later
  - More recent data: 4.4% of 1734 SARS-CoV-2 (+) school age children had symptoms > 4 weeks and 1.8% have symptoms > 8 weeks.^
    - Very few persisted after 8 weeks

*Osmanov, I. M. *et al.* Preprint at medRxiv
^Molteni. E. *et al.* Preprint at medRxiv. May 2021

Questions?