Unexpected risks of COVID-19 on asthma control in children

Nicolas M. Oreskovic, MD, MPH

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Outline

• Childhood Asthma in USA and California
• Asthma disparities
• Defining childhood asthma control
• Childhood asthma stakeholders
• Managing childhood asthma during the COVID-19 pandemic
• Stakeholder experiences during the COVID-19 pandemic
• Key takeaway points
• Q&A
Childhood Asthma in the USA: Disease burden by the Numbers

- Uncontrolled asthma can significantly impact on quality of life, school attendance, family well-being, missed work days, and cost to families and society

- US prevalence of childhood asthma: 1 in 12 (6 million children)

- Asthma related emergency department visits are higher among children than adults (88 vs 42 per 10,000 population)
  - Higher rates among non-Hispanic Black children (297) and Hispanic or Latino children (84) than non-Hispanic White children (48)

- Higher rates of asthma related physician office visits in children than adults (431 vs 321 per 10,000 population)

https://www.cdc.gov/asthma/asthmadata.htm
Childhood Asthma in the USA (continued)

• Half of children with asthma have uncontrolled asthma
  – Uncontrolled asthma more common in non-Hispanic Black children (63%)

• Asthma deaths are rare and largely preventable, and lower in children than adults nationally (2.8 vs 10.0 per million), but disparities remain among children (1.2 non-Hispanic White vs 1.7 Hispanic or Latino vs 11.4 non-Hispanic Black)

https://www.cdc.gov/asthma/asthmadata.htm
Asthma Disparities

- In 2018, prevalence of asthma in US children <18 years was 7.5%
  - Higher rates in children aged 5-14 years (8.6%)
  - Higher rates in non-Hispanic Black children (14.3%)
  - Higher rates in Puerto Rican children (17.0%)
  - Higher rates in children in the Northeast (8.9%)
  - Higher rates in children with the lowest household incomes (10.2%)
- Children with a family history of asthma have 2-fold increased risk of developing asthma by age 4 years
- Regardless of family history of asthma, increased asthma rates among non-Hispanic Black children compared to non-Hispanic White children in preschool years
- Boys have higher incidence in earlier years, then decline with age; girls have steady rates across childhood

Johnson CC, Chandran A, Havstad S, et al. US Childhood Asthma Incidence Rate Patterns From the ECHO Consortium to Identify High-risk Groups for Primary Prevention. JAMA Pediatr. 2021;175(9):919–927.
Asthma: California

- Childhood asthma prevalence: 7.9%
- Adult lifetime asthma prevalence of 15.1% in 2020
- Average rates of seasonal influenza vaccine among adults with asthma (46.7% nationally vs 47.0-49.6% CA, 49.7-52.1% MA) (no data available in children)

- Average rates of co-occurrence of obesity and asthma in adults (38.8% nationally vs 38.4% in CA, 31.5% in MA)

https://www.cdc.gov/asthma/asthmadata.htm
https://www.cdc.gov/asthma/brfss/2020/brfsstechinfo.html
Managing Asthma
Asthma control in Children: Well controlled if...

- Have symptoms no more than 2 days a week, and
- Symptoms don’t wake you from sleep more than 2 nights a month
- Can do all your normal activities
- Have no more than 1 asthma attack a year requiring oral medications
- Do not need to take quick-relief medicines more than 2 days a week
- Peek-flow measurement (how well air moves in and out of the lungs) does not drop below 80% of your personal best
Childhood Asthma Management: Stakeholders

- Child with asthma
- Parents/Families
- Doctors and Nurses
- Schools
- Health/Medication Insurance Plans
- Government (setting guidelines, public resources, air quality)
- Non-Government Entities and Community Organizations (Community Action to Fight Asthma)
Childhood Asthma Management During the COVID-19 Pandemic
Managing Asthma:
Childhood asthma during the COVID-19 pandemic

• Focus on the COVID-19 pandemic, not SARS-CoV-2 infection
• Sudden substantial changes in environment, medical practice, and medication management during the COVID-19 pandemic
• Asthma has unique vulnerabilities to changes brought upon by the pandemic
  – Shared pathways and common risk factors
    • Physical activity
    • Food availability and consumption patterns
    • Weight control
    • Air quality
    • Indoor Environment
    • Medication Management
    • Health care access and delivery
Potentially important influences on asthma control during the COVID-19 pandemic
Environmental Changes

• Differences by state and municipality in implementing social distancing, stay-at-home, and masking mandates during the pandemic
• Potential impact on asthma control and complications
• School considerations - Virtual school classes:
  – Pro: no exposure to viruses from other children/teachers
  – Pro: less exposure to outdoor air pollution (improved air quality during early pandemic with fewer cars on the road)
  – Con: decreased opportunities for daily physical activity (active commuting, recess, PE class, after school play/sports)
  – Con: possible exposure to harmful indoor environments (tobacco smoke & indoor allergens including mold, roaches, rodents)

***Studies have shown both positive and negative effects of confinement in children with asthma depending on the environmental changes
Medical Care Changes

• Dramatic changes in care during COVID-19 pandemic
• Decreased visit volumes
• Rapid switch to virtual care
• Technology barriers
• Delayed/postponed routine care
• Parental fears /avoidance of medical settings
• Pro: new access to care opportunities (overcome distance, transportation, cost, daycare, work, etc barriers)

• What we saw... Decreased pediatric asthma ED visits at MGH during first several months of pandemic (compared to increased overall ED visits and hospitalizations)

Taquechel K, Diwadkar AR, Sayed S, et al. Pediatric Asthma Health Care Utilization, Viral Testing, and Air Pollution Changes During the COVID-19 Pandemic. *J Allergy Clin Immunol Pract*. 2020;8(10):3378-3387.e11.
Medication Management Changes

- Medication use/adherence: possibly improved?
- Early Concern: avoidance of corticosteroids – an important medication in asthma management - due to concerns about delayed virus clearance and risk for increased mortality. Current recommendation is to *not* modify routine asthma treatment out of concern about COVID-19 infection
- Metered dose inhalers with spacer/face mask, avoid nebulizers to reduce the risk of spreading infection
- Importance of proper infection control techniques for respiratory diseases (Peak Flow measurements, etc)
Other Pandemic-Related Challenges and Changes

• Importance of having a system in place for differentiating asthma exacerbation from COVID-19 infection, given often overlapping symptoms

• Primary Prevention: Importance of vaccination (COVID-19, influenza, Pneumonia)

• Increased anxiety and mental health problems in children during the pandemic; known impact on asthma control
Variations & Disparities:
Important considerations in asthma management

• Urban vs Rural
  – Outdoor air quality
  – Access to care
  – Population density and “Hot Spots”
  – Government ordinances (stay-at-home, social distancing, masking)

• Socioeconomic status
  – Employment status and resulting household exposure load
  – Public transportation requirement
  – Access to safe spaces for physical activity
  – Access to healthful foods/school meals
  – Likelihood of exposure to indoor air pollutants and irritants (mold, mice, roaches, tobacco smoke)
  – Likelihood of school closure (public vs private school)
  – Psychosocial stressors/Stress load
Caregiver Experience:

• Most (80%, n=93) caregivers of children with asthma report concern that COVID-19 will affect their child’s health
• More than half of caregivers restricted their child’s physical activity to avoid asthma symptoms
• Dose dependent relationship between worrying about COVID-19 and physical activity restriction → risk for worsening asthma control and obesity

• Caregivers (n=16) reported increased asthma symptom awareness, and asthma control
• Avoidance seeking medical care driven by fear
Caregiver Experience: Disparities

- Black, Indigenous, or other People of Color (BIPOC) parents of children with asthma reported that COVID-19 resulted in greater resources losses and access to healthcare than parents of non-Hispanic White children (n=321)

Clawson AH, Nwankwo CN, Blair AL, Pepper-Davis M, Ruppe NM, Cole AB. COVID-19 Impacts on Families of Color and Families of Children With Asthma. *J Pediatr Psychol.* 2021;46(4):378-391.
Healthcare Provider Experience

• International study in early pandemic (summer 2020), healthcare professionals (n=339, from 52 countries) reported overwhelming shift in care to telephonic (79% of asthma follow-up consultations were replaced by phone calls)

• Most providers stopped using lung function tests to diagnose and manage asthma, relying instead on clinical information

Eguiluz-Gracia I, van den Berge M, Boccabella C, et al. Real-life impact of COVID-19 pandemic lockdown on the management of pediatric and adult asthma: A survey by the EAACI Asthma Section. Allergy. 2021;76(9):2776-2784.
School Experience

• Differentiating COVID-19 from asthma and from seasonal allergies is difficult

• Importance of messaging from school leadership:
  – Strong evidence that masks do not exacerbate underlying lung conditions including asthma
  – Children with asthma can learn in-person at school as they do not appear to be at increased risk of COVID-19 infection or severe disease
  – The COVID-19 vaccine has been demonstrated to be safe and effective in children, including children with asthma
  – Continue regular asthma medication management (inhaler use)
  – Promote physical activity during the school day

Abrams EM, Jordan K, Szefler SJ. School Asthma Care During COVID-19: What We Have Learned and What We Are Learning. *J Allergy Clin Immunol Pract*. 2022;10(2):453-459.
Key Points:

• National and International asthma guidelines have been updated to account for COVID-19
• Asthma treatment in children should followed published guidelines but be ready to accommodate and innovative care delivery and disease management during a pandemic
• Knowledge of local factors, including infectivity rates, healthcare capacity, outdoor air quality, masking adherence, and school closure status, can play an important role in guiding local guidelines and treatment decisions
• Awareness and understanding of upstream factors that influence asthma control is essential (environment, medical care, medication management)
• Socioeconomic disparities can have a large impact on childhood asthma (housing, school, parental employment, public transportation use, exposure risk)
• Telehealth and digital monitoring may play an important role in asthma management during a pandemic
• The needs of the community will evolve as new challenges arise during a pandemic
Thank you!

Q & A