What to call a toddler who coughs and wheezes? Shifting trends in asthma, bronchiolitis, and viral pneumonia over 10 years

Michelle R. Brajoich MD, William Taal MD, Scott E.D. Kreider MS, Gabrielle E. Bau MS, James Gaensbauer MD MScPH

METHODS

independence of children being admitted.

A 2014 American Academy of Pediatrics (AAP) guideline recommends against unnecessary interventions such as bronchodilators or steroids in 1 to 23-month-old children with bronchiolitis.

The AAP guideline is based primarily on studies in children less than 12 months but is written for children through 23 months and may, at times, be extrapolated to older children clinically.

Hypothesis: Over time providers have become less likely to diagnose children age 1-4 years with asthma or reactive airways disease (RAD) and more likely to diagnose them with bronchiolitis or viral pneumonia, providing supportive care alone.

METHODS

Retrospective chart review on admission of children age 1-4 years (n=169,207) between 2010-2019 was conducted using the Pediatric Health Information System (PHIS) database.

We evaluated percentage of bronchiolitis, asthma/RAD, and viral pneumonia diagnosis out of all LRTI admissions and assessed steroid use by year and age.

Logistic regression was used to model the percent change in diagnosis and steroid use. An interrupted time series model was used to evaluate the pre-2014/post-2014 changes. We assumed independence of children being admitted.

RESULTS

Figure 1. Diagnosis of asthma decreases as bronchiolitis and/or viral pneumonia diagnosis increases in all age groups 1-4 years over 2010 to 2019. The percent change is more significant after 2014 than prior to 2014.

Table 1. Annual percent change in the odds of LRTI diagnoses before and after 2014 AAP guideline

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>1 yr p-value</th>
<th>2 yr p-value</th>
<th>3 yr p-value</th>
<th>4 yr p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asthma/RAD</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Bronchiolitis</td>
<td>0.0019</td>
<td>0.0027</td>
<td>0.0102</td>
<td>0.0175</td>
</tr>
<tr>
<td>Viral Pneumonia</td>
<td>0.0535</td>
<td>0.0517</td>
<td>0.4784</td>
<td>0.0102</td>
</tr>
<tr>
<td>Steroid Use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2. Steroid use in children 1-4 years with LRTI decreases over time

CONCLUSIONS

Between 2010 and 2019, the following trends in diagnoses have been observed:

• Bronchiolitis/Viral pneumonia has increased
• RAD/asthma has decreased

Trends of diagnoses, particularly in younger ages, became more pronounced after 2014, correlating to timing of the AAP bronchiolitis guideline.

Steroid use also declined within PHIS LRTI admissions.

IMPLICATIONS

We question whether some children between 1-4 years who demonstrate reactive physiology may be undertreated based on studies of bronchiolitis in children under 12 months.

We plan to evaluate the effect of steroid administration on hospital length of stay in children age 1-4 years to evaluate the clinical implication of this shift in diagnosis and management.

REFERENCES


No Disclosures