Assessment of Airway Inflammation Using Exhaled Nitric Oxide (FeNO) in Pediatric Asthma and Its Impact on Treatment Decisions

M Massanari¹, SJ Szefler² and BE Chipps³
¹Circassia Pharmaceuticals, Morrisville, NC; ²Children’s Hospital Colorado, Denver, CO; ³Capitol Allergy, Sacramento, CA

INTRODUCTION

• Pediatric asthma continues to be challenging, including significant rates of misdiagnosis and patients who are poorly controlled
• Periodic clinical assessment together with objective tests helps to improve the diagnosis and management of asthma
• FeNO is an accurate biomarker of T2 airway inflammation and helps to identify patients at risk for an asthma exacerbation (1)
• Incorporating FeNO into asthma care can reduce the risk for future events (2)

OBJECTIVE

• Explore the real world impact of the clinical use of FeNO on physician’s treatment decisions in pediatric asthma

METHODS

• Physicians were invited to participate in a survey to evaluate the impact of measuring FeNO on treatment decisions
• Before measuring FeNO, physicians recorded presence of symptoms, medication use, assessed the likelihood of significant airway inflammation and made a preliminary treatment plan
• FeNO was then measured and based on the result, physicians recorded what changes in drug therapy were necessary from their original assessment

RESULTS

• Survey data was obtained from 149 asthma specialists who evaluated the impact of using FeNO among 1,237 patients <12 yrs of age
• The clinical assessment of airway inflammation more closely matched the measured FeNO when the FeNO was low (5-19 ppb) compared to when the FeNO was high (37-273 ppb):

<table>
<thead>
<tr>
<th>FeNO Level</th>
<th>Matched</th>
<th>Not Recognized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low FeNO</td>
<td>70% N=463</td>
<td>30% N=196</td>
</tr>
<tr>
<td>High FeNO</td>
<td>31% N=99</td>
<td>69% N=222</td>
</tr>
</tbody>
</table>

- Presence of symptoms influenced the likelihood that the clinical assessment of airway inflammation matched the FeNO:

<table>
<thead>
<tr>
<th>Symptomatic/ High FeNO</th>
<th>Asymptomatic/ Low FeNO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Matched</td>
<td>Not Recognized</td>
</tr>
<tr>
<td>41% N=43</td>
<td>59% N=62</td>
</tr>
<tr>
<td>36% N=176</td>
<td>64% N=338</td>
</tr>
</tbody>
</table>

- Measuring FeNO resulted in treatment changes in 39% of patients (481/1,237)
- Changes in treatment were made more frequently when FeNO was high (77%, 248/321) vs when FeNO was low (17%, 114/659)
- Steroids were stepped up in response to a high FeNO measurement:

![Graph showing treatment changes in patients with high FeNO (>35ppb)](image)

CONCLUSION

• Recognition of airway inflammation in children with asthma was improved by measuring FeNO compared to usual care.
• Knowledge of FeNO, as an indicator of T2 airway inflammation, resulted in significant changes in asthma treatment.
• Specifically, when physicians became aware of a high FeNO, corticosteroid treatment was stepped up.

References