Characterization of Hypereosinophilia in a University Health Care System

Jennifer C. Li, M.D.1, Basil Kahwash, M.D.2, Princess Ogbogu, M.D.2, and Sameer K. Mathur M.D., Ph.D.3
1University of Wisconsin-Madison, Department of Medicine, Division of Allergy, Pulmonary and Critical Care
2The Ohio State University Wexner Medical Center, Division of Allergy and Immunology, Department of Otolaryngology

Abstract

• Rationale: Due to the relatively rare diagnosis of hypereosinophilic syndrome (HES) and hypereosinophilia of unknown significance (HEUS), and the broad differential for hypereosinophilia, the evaluation of hypereosinophilia can be challenging. We present an approach to the characterization of hypereosinophilia, and its etiology of hypereosinophilia on multiple CRCBS in a University based health care system.

• Methods: In an IRB-approved EMR-based protocol, 98 patients were identified with absolute eosinophil values ≥1500 cells/µL. Patients were evaluated by current specialists in the clinic that they were seen the most recent eosinophil value ≥ 1500 cells/µL. The EMR was accessed for eosinophil counts and clinical notes to determine specialists involved in evaluating hypereosinophilia and whether an etiology was identified. Results: Of the 98 patients, 44% had a single untreated transient episode of hypereosinophilia ranging from less than 1 week to 43 months. Of those patients, 14% had hypereosinophilia that resolved after 1 year, and 67% had hypereosinophilia that resolved in less than one month. Two patients had persistent hypereosinophilia of unknown etiology for over 1 year. Additionally, of the 98 patients, 35% had an identifiable etiology, including malignancy, drug-induced, eosinophil gastrointestinal disease, vasculitis, and HES. Patients were referred to an allergist (24%), hematologist (20%), gastroenterologist (10%), infectious disease (5%), pulmonologist (12%), rheumatologist (9%), or dermatologist (4%). Twenty-two patients were not evaluated by any specialist.

• Conclusions: In the University of Wisconsin cohort, many patients had an identified etiology (35%) or transient hypereosinophilia of varying duration (44%). Episodes of hypereosinophilia that are sustained may require specialist referral.

Table 1. Etiology of Hypereosinophilia

<table>
<thead>
<tr>
<th>Etiology</th>
<th>No. of Patients</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malignancy</td>
<td>8</td>
<td>8%</td>
</tr>
<tr>
<td>Drug-induced</td>
<td>8</td>
<td>8%</td>
</tr>
<tr>
<td>HES</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>GI disease</td>
<td>6</td>
<td>6%</td>
</tr>
<tr>
<td>Vasculitis</td>
<td>2</td>
<td>2%</td>
</tr>
<tr>
<td>Infection</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Other</td>
<td>7</td>
<td>7%</td>
</tr>
<tr>
<td>Unclear</td>
<td>64</td>
<td>65%</td>
</tr>
</tbody>
</table>

Table 2. Pattern of Hypereosinophilia Episodes

<table>
<thead>
<tr>
<th>Episodes of Hypereosinophilia</th>
<th>Total No. of Patients</th>
<th>Identified Etiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustained persistent episode</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Sustained transient episode</td>
<td>51</td>
<td>8</td>
</tr>
<tr>
<td>Multiple episodes</td>
<td>43</td>
<td>19</td>
</tr>
</tbody>
</table>

Figure 1. Number of Patients Evaluated By Specialists

- 76 of 98 patients were evaluated by a specialist.
- Of the 64/98 patients with an unclear etiology for their hypereosinophilia, 42 patients were evaluated by a specialist.
- All 22 patients not evaluated by a specialist had an unclear etiology.

Figure 2. Sustained Transient Hypereosinophilia Episode Length with Unclear Etiology

- 55 of 98 patients were women.
- Age ranged from 34 months to 90 years of age, with 49% of patients over 50 years of age.

Methods

• In an IRB-approved EMR-based protocol, 98 patients with episodes of hypereosinophilia were identified with absolute eosinophil values ≥1500 cells/µL on at least 2 occasions after 2000.

• EMR was reviewed to identify which medical specialists were involved in the management and the etiology of hypereosinophilia, if identified.

• Hypereosinophilia episodes were categorized as
  - Sustained persistent episode did not resolve based on the most recent eosinophil count.
  - Sustained transient episode resolved (<1500/µL) with no further hypereosinophilia.
  - Multiple episodes were defined as episodes of hypereosinophilia with eosinophil values <1500/µL in-between hypereosinophilia.

Discussion

• Of the 98 patients, 44% had a single untreated transient episode of hypereosinophilia ranging from less than 1 week to 43 months.
  - Of those patients, 14% had hypereosinophilia that resolved after 1 year, and 67% had hypereosinophilia that resolved within one month.
  - Two patients had persistent hypereosinophilia of unknown etiology for >1 year.
  - 35% of the 98 patients had an identifiable etiology, including malignancy, drug-induced, eosinophil gastrointestinal disease, vasculitis, and HES.
  - 22 patients were not evaluated by any specialist.

Conclusions

• In the University of Wisconsin cohort, many patients had an identified etiology (35%) or transient hypereosinophilia of varying duration (44%).
• Episodes of hypereosinophilia that are sustained may require specialist referral.

References