Seasonal Administration of Omalizumab in Patients With Uncontrolled Asthma and Sensitization to Olive Pollen

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Sensitization to olive pollen leads to the development of asthma. In areas with high pollen counts, such as the southern Mediterranean, sensitization to Ole e 7 leads to more severe asthma [1-3].

In Córdoba, olive and grasses are major sources of pollen, causing rhinoconjunctivitis and asthma during the spring season. Only olive pollen reaches extreme counts (>20 000 grains/m³/y).

Allergen immunotherapy (AIT) is indicated when sensitization is clinically relevant and pharmacologic control of asthma is not satisfactory. When sensitization to Ole e 7 is single or predominant, AIT is associated with a higher incidence of adverse reactions [4]. Moreover, poor control of minor allergens in most extracts constitutes an additional difficulty [5]. Therefore, AIT could be inappropriate for patients predominantly sensitized to Ole e 7.

Omalizumab has been widely used to treat severe perennial allergic asthma [6]. However, few data are available on severe asthma due to pollen sensitization. The aim of this study was to analyze the results of a pilot seasonal treatment with omalizumab under conditions of daily clinical practice in patients with uncontrolled seasonal asthma, strong sensitization to minor olive allergens, and exposure to high pollen counts.

Retrospective data from 33 patients (84.4% women; mean [SD] age, 31.4 [12.35] years) were selected based on the following: (1) high exposure to olive pollen; (2) moderate-severe persistent asthma [7]; (3) poor control of symptoms in 2 previous springs according to the GEMA guidelines [7]; (4) relevant sensitization to minor olive allergens (mean [SD]...
A summarized asthma control index (SACI) was established based on the GEMA guidelines [7], with the following values:

- SACI 2 (well-controlled asthma): absence of night symptoms, activity limitations, exacerbations, daytime symptoms ≤2 d/wk; need for SABA ≤2 times/wk; FEV₁ ≥80% of theoretical value.
- SACI 1 (partially controlled asthma): at least 4 out of 6 conditions from SACI 2.
- SACI 0 (badly controlled asthma): fewer than 4 out of 6 conditions from SACI 2.
- The SACI was obtained monthly from March to June 2013 at the visits for administration of omalizumab.

The statistical analysis was based on the worst SACI obtained for each patient. The overall spring SACI for 2011 was obtained from medical records.

We performed a descriptive analysis of variables and compared the 2013 and 2011 seasons (before and after omalizumab). The 2012 season was not considered in order to avoid possible bias due to lower pollen counts (Supplementary Figure 2). The McNemar test was used to measure the consistency of changes in the SACI and severity parameters (need for oral corticosteroids, emergency visits). A bivariate analysis (χ²) was performed based on the dependent variable (SACI) and the independent variables sex and age. Significance was set at α=0.05.

The study protocol was approved by the local ethics committee, and informed consent was obtained from all patients or their legal representatives.

Omalizumab doses ranged from 150 mg/4 wk to 600 mg/2 wk. The most frequent dose was 450 mg/2 wk (27.2% of patients). Both the SACI and severity parameters were significantly improved (P<.001) after treatment with omalizumab (Table). Detailed data are shown in Supplementary Figure 3. The best results were obtained from patients in GEMA step 6 (Supplementary Table 1). The χ² test revealed no significant differences between SACI and the independent variables (sex, P=1.000; age, P=.688).

This study showed that seasonal treatment with omalizumab improves disease control in patients with uncontrolled asthma due to olive pollen allergy. Patients in the study had poorly controlled asthma during the olive pollen season but remained mostly asymptomatic for the rest of the year. Nevertheless, guidelines do not classify seasonal asthma as perennial based on severity.

Asthma control is a complex health problem from the perspective of its indicators. In the present study, omalizumab had an impact on all patients by reducing the need for oral corticosteroids and the number of visits to the emergency department. Patients experienced fewer symptoms with fewer drugs and medical interventions. It remains unknown whether, in addition to better controlling asthma, omalizumab has a possible preventive role in future worsening, as well as potential cost savings [9].

Previous studies on seasonal treatment with omalizumab in pollen-allergic patients with rhinitis [10,11] have revealed an improvement in symptoms and quality of life and reduced use of rescue medication [10,11].

An important aspect of this study was that patients were treated with omalizumab for only 16 weeks. If we had overlooked the seasonal nature of asthma and treated patients based on degree of severity and control, we would have used 6708 prefilled syringes (150 mg) (€2 931 328.92). In contrast, we only consumed 516 syringes (€225 486.84).

In summary, reduced drug administration and better control of severe pollen-induced asthma through seasonal treatment with omalizumab results in an appropriate cost-benefit balance compared with a perennial schedule. Health care systems should not ignore this protocol.

The main limitations of the study were its retrospective design and the small sample size. Nevertheless, our results

<table>
<thead>
<tr>
<th>SACI</th>
<th>No. (%)</th>
<th>McNemar</th>
<th>OCS No. (%)</th>
<th>McNemar</th>
<th>Emergency, No. (%)</th>
<th>McNemar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before omalizumab (2011)</td>
<td>2</td>
<td>0</td>
<td>10</td>
<td>(30.3%)</td>
<td>12</td>
<td>(36.3%)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>11 (33.3%)</td>
<td>21 (P&lt;.001)</td>
<td>5</td>
<td>(15.1%)</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>22 (66.7%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>After omalizumab (2013)</td>
<td>2</td>
<td>12 (36.4%)</td>
<td>21 (P&lt;.001)</td>
<td>5</td>
<td>(15.1%)</td>
<td>16.2</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>14 (42.4%)</td>
<td>2.777 (P=.095)</td>
<td>2</td>
<td>(6%)</td>
<td>17.2</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>7 (21.2%)</td>
<td>0.88 (P=.345)</td>
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</table>

Abbreviation: OCS, oral corticosteroids; SACI, summarized asthma control index.
highlight the importance of classifying asthma and may enable improved allocation of therapeutic resources.

The omalizumab schedule we describe in patients with severe asthma and a complex olive pollen sensitization profile may lead to better control of asthma and, therefore, could represent a successful alternative therapy for affected patients. However, more studies are needed to validate this proof of concept.

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Conflicts of Interest

The authors declare that they have no conflicts of interest.

References


