Therapeutic ratios predict asthma control in the ASTROLAB cohort
Manon Belhassen1,2, Alexandra L. Dima3, Maëva Nolin1, Nathalie Texier4, Montse Ferrer4, Marjine de Bruin1,2, Eric Van Ganse1,2,7 and the ASTROLAB group

1 Pitié-Salpêtrière, Paris, France
2 NEFPER TICIS, Health Services and Performance Research
3 Department of Communication Science, AICcall, University of Amsterdam, Amsterdam, The Netherlands
4 Kappa Santé, Paris, France
5 IMIM—Hospital del Mar Medical Research Institute, Barcelona, Spain
6 University of Aberdeen, Scotland
7 Respiratory Medicine, Croix Rousse University Hospital, Lyon, France

AIM

Inhaled corticosteroids (ICS) are the cornerstone of asthma therapy. The ICS-to-total-asthma-medication ratios (ICS therapeutic ratios) indicate suboptimal disease management in asthma. ASTROLAB, a FP7 European project assessing the safety of long-acting β2-agonists (LABA), included a cohort of persistent asthma patients in France and the United Kingdom (UK).

The objective of this study was to verify whether therapeutic ratios predict asthma control in the ASTROLAB cohort.

METHOD

ASTROLAB included UK and French persistent asthma patients (6-40 years) prescribed ≥6/12 months of controller asthma therapy. Patients were prospectively followed for ≥12 months, with 4-monthly asthma control assessments.

Adults were administered the ACQ (score ranges 0-6, uncontrolled asthma cut-off score >0.75). Parents of children completed the RCP3Q (score range 0-9, cut-off score ≥1).

Medication data from French claims (SNIIRAM) or UK prescribing (THIN) databases were used to compute therapeutic ratios over 12 months before each control assessment.

We compared the occurrence of uncontrolled asthma in patients with ICS therapeutic ratios <50% vs. ≥50%, using Generalized Linear Mixed (GLM) models, for the overall cohort and in three specific subgroups with adequate sample sizes (UK and French adults, and French children).

RESULTS

773 patients (mean age = 22.2 years, 48.6% females) with 2,622 measurements were included in the analyses. The distribution of the ICS therapeutic ratios were described for UK and French adults, and French children:

Using GLM models, the risk of having uncontrolled asthma was significantly higher for patients with ratio<50% (OR=1.86, 95%CI=[1.45-2.38]) compared to patients with ratio ≥50%.

This was the case for the 3 subgroups:

**French adults (474 patients; 1,775 measurements):**

<table>
<thead>
<tr>
<th>Effect</th>
<th>Value</th>
<th>IC 95%</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio &lt;50% vs ≥50%</td>
<td>1.71</td>
<td>1.24</td>
<td>2.36</td>
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</tbody>
</table>

**UK adults (111 patients; 191 measurements):**

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<th>Effect</th>
<th>Value</th>
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<th>p-value</th>
</tr>
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<tr>
<td>Ratio &lt;50% vs ≥50%</td>
<td>2.81</td>
<td>1.36</td>
<td>5.81</td>
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**French children (148 patients; 591 measurements):**

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<th>Effect</th>
<th>Value</th>
<th>IC 95%</th>
<th>p-value</th>
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<tr>
<td>Ratio &lt;50% vs ≥50%</td>
<td>1.96</td>
<td>1.20</td>
<td>3.20</td>
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CONCLUSION

In this study, low ICS therapeutic ratios reflected insufficient prescribing of ICS relative to all asthma therapy, which facilitated deterioration of asthma control, both in France (adults and children) and in the UK (adults) populations.

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Contact: Dr Eric Van Ganse, eric.van-ganse@univ-lyon1.fr