Differences in Patient Characteristics between Asthma Patients with and without Eosinophil Measurements

K. Verhamme 1, M. de Ridder 1, D. Webb 2, D. PrietoAlhambra 3, P. Rijnbeek 1, L. Pedersen 4, M. Van Dyke 5, G. Brusselle 6

1 Erasmus MC Rotterdam, the Netherlands. 2 GSK, London, United Kingdom. 3 CSM-NDORMS, University of Oxford, Oxford, United Kingdom. 4 Aarhus University Hospital Aarhus, Denmark. 5 GSK, Collegeville, PA, United States. 6 University Hospital Ghent, Ghent, Belgium

Background & Objectives
The association between high blood eosinophils and risk of asthma exacerbation is well established. In real life, there is scarce data available on patient characteristics of asthma patients with and without blood eosinophil measurements, irrespective of the blood eosinophil value.

Methods
• Multinational, multidatabase retrospective cohort study using routinely collected electronic health care data from 4 European countries: the Netherlands (IPCI), Denmark (Aarhus), UK (CPRD) and Spain (SIDIAP), all members of the EU-ADR alliance
• Study period: 2008–2017
• Study population: adult patients with asthma (= asthma disease code with prescriptions/dispensing of asthma drugs within 3 months before or after asthma diagnosis) and at least 1 year of follow-up in the respective database
• Follow-up time: from asthma diagnosis or start of study period until end of observation in database or end of study period
• All blood eosinophil measurements during follow-up were extracted
• Patient characteristics: gender, age at start follow-up, smoking, anxiety/depression, atopy, cancer, cardiovascular and cerebrovascular disease, chronic rhinosinusitis, diabetes mellitus, gastroesophageal reflux disease, nasal polyposis, obesity. All characteristics were defined at start of follow-up.

Statistical analysis:
• Relative risks (RR) for the outcome, presence of blood eosinophil measurement, were estimated for each patient characteristic, crude as well as adjusted for age and follow-up time.

Results
• The asthma cohort consisted of 660,185 patients of whom 60% had at least one blood eosinophil measurement, with substantial differences between the databases (Table 1).
• Older age (Table 1), female gender, and underlying comorbidity increased the probability of presence of blood eosinophil measurement (Figure 1).
• Determinants of presence of blood eosinophil measurement were most pronounced in Aarhus & IPCI, both databases where the proportion of patients with blood eosinophil measurement was lower.

CONCLUSIONS
✓ In real life data, age and female gender increase the probability of getting a blood eosinophil measurement.
✓ Underlying comorbidity was mainly a determinant in databases with a relatively low proportion of blood eosinophil measurements amongst asthma patients, indicating the reason for the measurement might have been other than asthma.
✓ This selectivity in measurement might change if blood eosinophil measurement, as part of asthma management, becomes routine practice in primary care.

Table 1. Asthma patients with and without blood eosinophil measurement

<table>
<thead>
<tr>
<th></th>
<th>IPCI (NL)</th>
<th>Aarhus (DK)</th>
<th>CPRD (UK)</th>
<th>SIDIAP (SP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eosinophil measurement</td>
<td>Present</td>
<td>Absent</td>
<td>Present</td>
<td>Absent</td>
</tr>
<tr>
<td>Number (%)</td>
<td>31,008 (29%)</td>
<td>77,191 (71%)</td>
<td>18,028 (60%)</td>
<td>12,047 (40%)</td>
</tr>
<tr>
<td>Males, %</td>
<td>31%</td>
<td>42%</td>
<td>38%</td>
<td>50%</td>
</tr>
<tr>
<td>Age, mean (SD)</td>
<td>48.6 (17.5)</td>
<td>45.0 (17.7)</td>
<td>46.3 (18.0)</td>
<td>39.1 (19.3)</td>
</tr>
</tbody>
</table>

Figure 1. Relative risks for presence of blood eosinophil measurement, adjusted for age and follow-up time

Conflict of interest: KV, MR, DPA, PR, LP and GB have no conflict of interest in relation to the content of this work.

Funding: This research has been funded by GSK. (PRJ2756)