**Review of new biomarkers that predict the pharmacokinetics of biologic drugs in inflammatory bowel disease**

I. BELTRA-PICÓ1, P. MAS-SERRANO1, C. COLOMER-AGUILAR1, R. NALDA-MOLINA1, A. RAMON-LOPEZ2, M. DIAZ-GONZALEZ1, J. SELVA-OTAOLARRUCHI1, A. GUTIERREZ-CASBAS1

1. Hospital General Universitario De Alicante, Clinical Pharmacokinetic Unit-Pharmacy Department, Alicante, Spain;  
2. Miguel Hernández University, Division of Pharmacy and Pharmaceutics, Alicante, Spain;  
3. Hospital General Universitario De Alicante, Digestive Department, Alicante, Spain

**Background and importance:**

Adalimumab is an anti-TNFα monoclonal antibody used in inflammatory bowel disease (IBD). Its efficacy can benefit from therapeutic drug monitoring (TDM). Certain biomarkers can be useful in future pharmacokinetics adjustment model designs.

**Aim and objectives:**

To study the correlation between plasmatic concentrations (Cp) of adalimumab and the plasmatic concentrations of prealbumin and albumin in patients with IBD.

**Métodos:**

- **Study design:** Observational and retrospective carried out from September 2020 to January 2022.  
- **Inclusion criteria:**  
  - Patients older than 18 years with diagnosis of IBD (Crohn disease [CD] or ulcerative colitis [UC]).  
  - Patients receiving treatment with adalimumab maintenance therapy.  
  - Having a trough Cp of adalimumab, albumin and prealbumin obtained the same day.  
- **Exclusion criteria:**  
  - The presence of anti-adalimumab antibodies.  
- **Variables collected:** Gender, age diagnosis, and Cp of adalimumab trough, albumin and prealbumin.

- The analytical determinations of adalimumab were made by ELISA (Theradiag®). Range test 0.3-20 ug/ml.  
- The statistical analysis was made using R 4.1.1 Statistical software.

**Resultados:**

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Disease/Patients (n, %)</th>
<th>Crohn disease</th>
<th>Ulcerative colitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Women (%)</td>
<td>48.2%</td>
<td>50 (89.3%)</td>
<td>6 (10.7%)</td>
</tr>
<tr>
<td>Age (years)*</td>
<td>40.0 (22.5-46.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight (Kg)*</td>
<td>62.0 (53.0-77.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albumin* (mg/dl)</td>
<td>4246 (3960-4472)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prealbumin* (mg/dl)</td>
<td>24.0 (21.0-27.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adalimumab* (ug/ml)</td>
<td>6.9 (4.6-9.3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Median, (p25-p75)*

Correlation between the adalimumab trough Cp and the Cp of prealbumin:  
R²: 0.287; p: <0.05

In those patients with prealbumin levels ≥ 24 mg/dl, the mean adalimumab trough Cp in maintenance therapy were significantly higher than those obtained that had prealbumin levels < 24 mg/dl.

<table>
<thead>
<tr>
<th>Prealbumin</th>
<th>Median (Adalimumab trough)</th>
<th>p25-p75</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 24 mg/dl</td>
<td>4.80 ug/ml</td>
<td>(3.70-7.35)</td>
<td>0.009</td>
</tr>
<tr>
<td>≥ 24 mg/dl</td>
<td>8.20 ug/ml</td>
<td>(5.58-11.65)</td>
<td></td>
</tr>
</tbody>
</table>

**Conclusions:**

- In the studied population sample of patients with IBD, a positive correlation between Cp of adalimumab and prealbumin was observed.  
- Prealbumin is a protein with a smaller half-life than albumin, it could be used as a predictive biomarker of adalimumab clearance modification.  
- To our knowledge it is the first study to find this association.

**Contact data:** beltra_iva@gva.es; patricio.mas.serrano@gmail.com