Rapid test Quantum Blue® faecal calprotectin as predictor of relapse in patients under maintenance treatment with Infliximab®

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Inflammatory bowel disease is a group of chronic diseases of gastrointestinal tract. The main diseases are Crohn’s disease and ulcerative colitis. In inflammatory bowel disease (IBD), predicting relapse by measuring non-invasive biomarkers could allow early treatment adaptation. Few data exists about the usefulness of close monitoring of calprotectin to predict relapse.
Infliximab is a chimeric IgG1 monoclonal antibody comprised of 75 percent human and 25 percent murine sequences, which has a high specificity for, and affinity to, tumor necrosis factor (TNF)-α.

Infliximab is administered through IV with an induction schedule comprising doses at weeks 0, 2 and 6. Maintenance doses are given every 4-8 weeks.

Infliximab is available for treatment of patients with moderately-to-severely active inflammatory bowel disease (Crohn's disease and ulcerative colitis).

Infliximab is also indicated for the treatment of rheumatoid arthritis, psoriatic arthritis, and ankylosing spondylitis.
The AIM of the study was to evaluate the predictive value of rapid test for faecal calprotectin levels for flares in patients with IBD under maintenance treatment with Inflixi
cab®.
Methods

• A prospective study was designed. Inclusion criteria were IBD patients (Crohn’s disease (CD) and ulcerative colitis (UC)) in clinical remission under a stable 5mg/kg Infliximab® therapy.

• Rapid test for fresh faecal calprotectin in a lateral flow immunoassay was measured the day of the infusion, received in gastroenterology office.

• Clinical examination was performed two months after the infusion. Relapse was defined as a Harvey-Bradshaw score >4 in CD patients and as a Mayo score >2 in UC patients.

• U-Mann Whitney test, Chi square test, Odds Ratio, ROC analysis and Logistic regression were performed in IBM® SPSS 20.
Calprotectin test

- **Calprotectin** is a 36-kDa calcium and zinc binding protein that accounts for about 60% of total proteins in the cytosol fraction in neutrophil granulocytes.

- **Quantitative Lateral Flow Assay**: The test is designed for the selective measurement of Calprotectin antigen by sandwich immunoassay designed for quantitative determination of hetero-dimeric Calprotectin in human stool samples. The 2° mAbs are conjugated to Colloid Gold particles for quantifying signal intensity of calprotectin.

- **The Quantum Blue® Reader** is a Lateral Flow Reader designed to analyze colorimetric tests by reflectometry. A clear digital reading in µg/g means no subjectivity in the analysis. The fast and precise scanning allows the detection of quantitative results in 15 minutes (excluding extraction time).
Results

- 43 patients were recruited (mean age 46 years ±11.9), 53.5% were female, 62.8% had CD and 37.2% UC. After two months, 81.4% patients remained in clinical remission and 19.6% presented a relapse.
Median calprotectin levels

- In patients in remission median calprotectin levels were 115.6 mg/kg of faeces. Patients who flared had significantly higher calprotectin levels at the moment of flare (median calprotectin levels of 278.9 mg/kg). (U-MW p<0.001)
ROC curve Flare Vs Remission

ROC analysis (flare vs remission) suggested that a calprotectin level of **110.5 mg/kg** indicated as the best cut-off point showed high sensitivity (100%) and high specificity (74.3%) to model flare. Area under the curve was 0.875 with good accuracy (p=0.001 SE: 0.053 CI 95%: 0.772-0.978).
Regression analysis

- For a value of calprotectin over 110.5 mg/Kg an OR = 1.889 (p < 0.001; CI 95%: 1.207-2.957) was obtained.

- Logistic regression analysis showed a 0.6% increased risk per unit of calprotectin (p = 0.047) in a model adjusted for age and sex.

### Variables en la ecuación

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<th>Variables</th>
<th>B</th>
<th>E.T.</th>
<th>Wald</th>
<th>gl</th>
<th>Sig.</th>
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* Variable(s) introducida(s) en el paso 1: Calprotectina, Edad, Sexo.
Conclusions

- In IBD patients under infliximab maintenance therapy, calprotectin levels highly correlate with prediction of a relapse.

- Remission is associated with low levels.
Thank you