Serum calprotectin in the diagnostic work-up of rheumatoid arthritis

There is a need for additional biomarkers to assist in the diagnosis of rheumatoid arthritis (RA). The aim of our study was to evaluate the diagnostic potential of serum calprotectin in RA. Additionally, the analytical performance of 4 different serum calprotectin assays was compared.

**OBJECTIVE**

Samples: n=469 (serum; RA= 56) of patients consulting a rheumatologist for the first time and of 20 healthy volunteers (serum and EDTA plasma)

- **Calprotectin assays:** Bühlmann MRPB/14 ELISA, Diasorin Calprotectin assay on the Liaison (R&D), Calprotectin Extended range ELISA Inova Diagnostics (R&D), Thermo Fisher ELIA Calprotectin 2 assay (R&D)
- **Other RA biomarkers:** C-reactive protein (CRP), erythrocyte sedimentation rate (ESR), rheumatoid factor (RF IgM, Thermo Fisher), anti-cyclic citrullinated peptide antibody (ACPA IgG, Thermo Fisher) were available.

**RESULTS**

**Method comparison**

- Results for blood calprotectin were assay dependent
- Good linear agreement between all serum calprotectin tests with Spearman’s rank r varying between 0.786 and 0.982
- The calprotectin results of the MRPB/14 ELISA were double those of the other assays

**Serum versus EDTA**

- Results for blood calprotectin were matrix dependent
- EDTA plasma calprotectin concentrations were half of the serum calprotectin concentrations
- The variability of calprotectin tended to be higher in serum than in plasma

**Serum calprotectine in RA**

- Serum calprotectin was higher in RA patients compared to diseased and healthy controls (Fig 2: A.1)
- CRP and calprotectin levels correlated with higher DAS28 (Fig2: A.3 and B.3)
- Calprotectin levels correlated with the need for biological treatment within the first year (Fig 2: A.5)
- There was no significant difference in AUCs between calprotectin tests (Fig 3.A)
- For some assays, using a cut-off corresponding to a specificity of 97.5% (cut-off defined on diseased controls), the sensitivity of calprotectin (26.8%) was significantly higher than the sensitivity of CRP (8.9%) and ESR (8.9%) (Fig 3.B)
- Applying such high specificity cut-off for calprotectin, CRP and ESR identified 9/56, 4/56 and 4/56 RA patients that tested negative for RF and ACPA, respectively

**ROC Analysis**

**Likelihood ratios**

Our data suggest an added diagnostic and prognostic value of serum calprotectin for RA.