Salivary Calprotectin as an Early Marker of Inflammatory Bowel Disease (IBD)

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Main findings

- Salivary calprotectin successfully discriminates IBD patients from healthy controls.
- Salivary calprotectin is 2.3 fold elevated in IBD patients compared to controls with up to 7.2 fold higher concentrations in newly diagnosed Crohn's disease.
- Calprotectin decreases after treatment in unstimulated saliva of treatment naïve CD patients.

Introduction

Inflammatory bowel disease (IBD), which includes Crohn's disease (CD) and ulcerative colitis (UC), is a chronic immune-mediated inflammatory disease of the gastrointestinal tract. Faecal calprotectin, a calcium-binding antimicrobial protein complex belonging to the S100 family, is routinely used as a marker of inflammatory activity, both at diagnosis and to monitor disease activity over time.

This pilot study aimed to assess whether calprotectin in saliva reflects the inflammatory activity in IBD patients.

Materials and methods

Whole saliva (unstimulated and stimulated) was collected from 17 IBD patients with active intestinal inflammation on endoscopy, and from 15 healthy controls (mean age ± SD : 44 ± 17 and 24 ± 2 years, respectively). Re-sampling of saliva from the IBD patients was performed at 10-12 weeks after treatment escalation, during remission. Disease activity was on a 4-grade Physician Global Assessment scale (PGA).

Calprotectin concentrations were measured with an enzyme-linked immunoassay and related to serum calprotectin concentrations, clinical outcome and routine laboratory parameters.

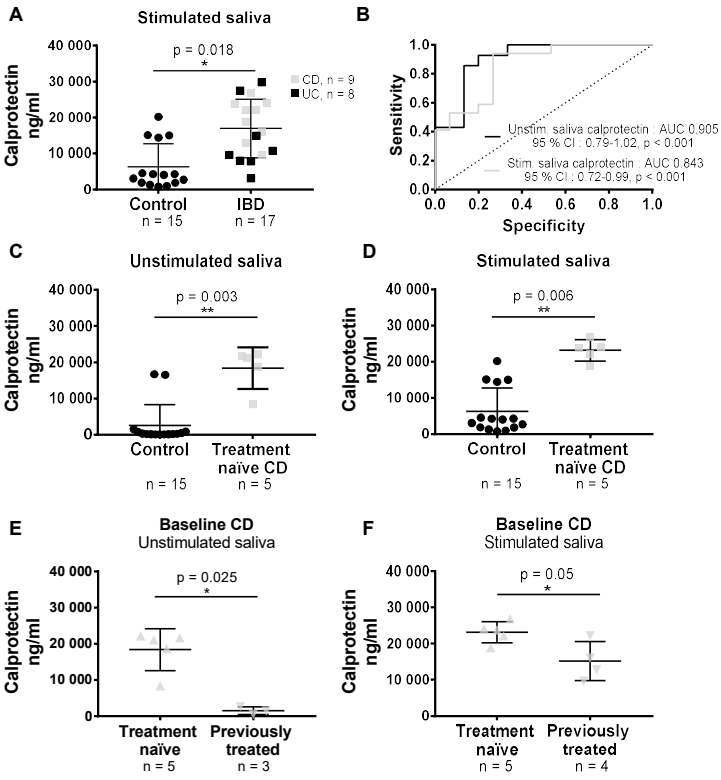

Figure 1. Salivary calprotectin in IBD compared to healthy controls.
A) Calprotectin in stimulated saliva in healthy individuals compared to IBD patients. **B)** The area under the curve of Receiver-Operator Characteristics in unstimulated/stimulated saliva in IBD and health. Calprotectin in **C)** unstimulated and **D)** stimulated saliva of treatment naïve CD patients compared to healthy controls. Calprotectin at baseline in **E)** unstimulated and **F)** stimulated saliva of treatment naïve compared to previously treated CD patients. Data presented as mean±SD, analyzed by Mann-Whitney U-test (except for B).

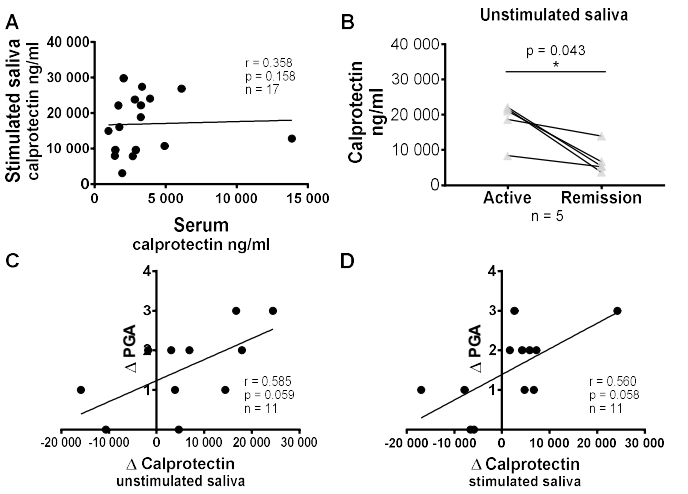

Figure 2. Salivary calprotectin in relation to disease activity.
A) Correlation between calprotectin concentrations in stimulated saliva and serum at baseline. **B)** Calprotectin in unstimulated saliva of treatment naïve CD patients at baseline and 10-12 weeks after treatment. Correlation between the change from baseline to follow-up (Δ) in the calprotectin concentration in **C)** unstimulated and **D)** stimulated saliva, and Physician Global Assessment (PGA). PGA; 0 = clinical remission, 1 = mild disease activity, 2 = moderate disease activity, and 3 = severe disease activity. Analyzed by Wilcoxon signed rank test (A) and Spearman's rho.

Conclusion

Salivary calprotectin is a potential early marker of IBD, with promising sensitivity and specificity to diagnose and monitor intestinal inflammation. These findings need to be validated in larger cohorts, with consideration of dental status.

If consistent, analysis of calprotectin in saliva might accelerate disease diagnosis, possibly replace faecal measurements and provide patients with means to self-monitor disease.

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