Fecal Calprotectin

The usefulness in special clinical situations and issues on the sampling procedure

Anders Lasson
Department of Internal Medicine
Institute of Medicine at the Sahlgrenska Academy, University of Gothenburg, Sweden

Ulcerative colitis and Crohn's disease are chronic inflammatory bowel diseases (IBD) of unknown etiology. In recent years, mucosal healing has emerged as the goal for therapy to achieve long-term remission and to change the natural course of IBD. Thus, it is essential to monitor thoroughly the disease activity. Fecal calprotectin is the best available biomarker of disease activity in IBD.
The overall aim of this thesis was to study the clinical usefulness of fecal calprotectin. Four different patient cohorts were investigated.

For patients with active ulcerative colitis, the fecal calprotectin levels varied considerably, even over a single day, and the variability was considered to be clinically important in up to one-third of the patients. However, the longer the time period between bowel movements, the higher were the concentrations of calprotectin. To reduce both the impact of the variability and the risk of false low calprotectin values, samples should be obtained from the first stool passed in the morning. In stool samples stored at room temperature, the concentrations of calprotectin were stable for 3 days, while the levels decreased significantly after 7 days. In a questionnaire, the patients with IBD declared that they did not find it burdensome to obtain stool samples, although suitable equipment was considered desirable.

The levels of fecal calprotectin did not distinguish between patients with endoscopic recurrence 1 year after ileocaecal resection for Crohn's disease and those without. However, in patients with low calprotectin values, endoscopic remission was commonly noted, suggesting that a colonoscopy might be avoided in these cases.

In the group of patients with quiescent ulcerative colitis, dose escalation of 5-aminosalicylic acid (5-ASA) in those patients identified with increased levels of calprotectin significantly reduced the relapse rate. However, the overall relapse rate of the intervention group was not significantly lower than that of the control group.

At cut-off values for calprotectin of 169 µg/g and 262 µg/g, the clinical course in patients with newly diagnosed ulcerative colitis could be predicted with good specificity and moderate sensitivity, for 1 and 3 years, respectively.

Conclusions: These results facilitate standardization of the stool sampling procedure, which is necessary to improve the accuracy of this biomarker. Furthermore, fecal calprotectin might be used to select patients for ileocolonoscopy 1 year after ileocaecal resection for Crohn's disease. To treat patients with IBD in clinical remission, but with increased values of calprotectin suggesting subclinical disease activity, brings a new dimension to IBD care. In this context, dose escalation of 5-ASA may be appropriate in patients with ulcerative colitis. This therapeutic concept should be tested also in patients with new onset of ulcerative colitis.

Keywords: Inflammatory bowel disease; ulcerative colitis; Crohn's disease; fecal biomarker; calprotectin; 5-aminosalicylic acid; ileocaecal resection; colonoscopy.

ISBN 978-91-628-9162-6 http://hdl.handle.net/2077/36736

FECAL CALPROTECTIN

The usefulness in special clinical situations and issues on the sampling procedure

Akademisk avhandling

som för avläggande av medicine doktorsexamen vid Sahlgrenska Akademin vid Göteborgs universitet kommer att offentligen försvaras i hörsal Arvid Carlsson, Academicum, Medicinaregatan 3, Göteborg, fredagen den 28 november 2014 kl.13.00

av

Anders Lasson

Fakultetsopponent:
Professor Jørgen Jahnsen
Gastroenterologisk avdeling, Akershus universitetssykehus,
Institutt for klinisk medisin, universitetet i Oslo
Lørenskog/Oslo, Norge

Avhandlingen baseras på följande delarbeten:

I. The intra-individual variability of faecal calprotectin: A prospective study in patients with active ulcerative colitis.
Anders Lasson, Per-Ove Stotzer, Lena Öhman, Stefan Isaksson, Maria Sapnara, Hans Strid
J Crohn's Colitis 2014 Jul 5. pii: S1873-9946(14) [Epub ahead of print]

II. Fecal calprotectin one year after ileocaecal resection for Crohn's disease — A comparison with findings at ileocolonoscopy.
Anders Lasson, Hans Strid, Lena Öhman, Stefan Isaksson, Mikael Olsson, Britt Rydström, Kjell-Arne Ung, Per-Ove Stotzer
J Crohn's Colitis (2014) 8, 789–795

III. Pharmacological intervention based on fecal calprotectin levels in patients with ulcerative colitis at high risk of a relapse: A prospective, randomized, controlled study.
Anders Lasson, Lena Öhman, Per-Ove Stotzer, Stefan Isaksson, Otto Überbacher, Kjell-Arne Ung, Hans Strid
Submitted for publication

IV. Fecal calprotectin levels predict the clinical course in patients with new onset of ulcerative colitis.
Anders Lasson, Magnus Simrén, Per-Ove Stotzer, Stefan Isaksson, Lena Öhman, Hans Strid
Inflamm Bowel Dis 2013;19:576–581

UNIVERSITY OF GOTHENBURG