Comparison of CRP, Clinical Activity Indices and Fecal Lactoferrin with Disease Status in Ileocolonoscopy of Patients with IBD and IBS

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INTRODUCTION
Determining the presence of intestinal inflammation is the main criterion for the differentiation of irritable bowel syndrome (IBS) from inflammatory bowel disease (IBD) and for tailoring medical therapy. Clinical indices have proven too complex and time-consuming for daily routine practice leading to an assessment of clinical symptoms and use of independent lab parameters. Sensitivitity parameters for systemic inflammatory such as C-reactive protein (CRP) and sedimentation rate are utilized often in the clinical assessment of IBD but are limited by low sensitivity and specificity for intestinal inflammation. Lactoferrin, a neutrophil-derived protein, has been shown to be a sensitive and specific indicator of intestinal inflammation in IBD. Recent studies have shown the correlation of elevated fecal lactoferrin (pg/mL) to disease activity in IBD and the increase in levels as an indicator of relapse. Fecal lactoferrin is baseline in healthy subjects and in IBS. The aim of our study was to assess the correlation between levels of lactoferrin, serum CRP and clinical activity indices to grades of intestinal inflammation as determined by endoscopic and histopathologic examinations of subjects suspected of IBD and IBS.

METHODS
Subject Population: A total of 63 adult patients, 23 Crohn’s disease (CD), 21 ulcerative colitis (UC) and 20 IBS were enrolled following informed consent at an adult IBD clinic over an 8 month period. A total of 30 patients was scored as active IBD by endoscopy. The mean age was 42 years and the male-female ratio was 1.2:5.

Lab Parameters: Fecal lactoferrin was determined using ELSA (TECHLAB IBD-SCAMP) with a cut-off for elevated levels of 31 pg/mL. Serum CRP was determined using an ELISA (ORLIS, Tree-quest, Rauenhusblatt) with a positive cut-off of ≥ 1 mg/dL.

Activity Indices: A Calprotectin Activity Index (CAI) was used to assess subjects with UC using a cut-off of ≥ 5 mmol/L of activity index, reducing activity levels in CD.

Endoscopic Score: Endoscopically obtained histopathology specimens in addition to macroscopic colonoscopy results were used as the standard reference. Each endoscopy was scored regarding inflammation: 0 for “no active inflammation”, 1 for “mild active inflammation”, 2 for “moderate active inflammation” and 3 for “severe active inflammation”. “Mild inflammation” was defined as the appearance of a few scattered inflammatory cells, “Moderate inflammation” as defined as a severe increase in mucosal inflammation, and “Severe inflammation” as characterized by a distinct increase in mucosal bleeding, ulceration, edema and limitation of food passage.

Histopathology: Tissue biopsies were retrieved during the endoscopic exam from areas of disease involvement as determined visually. Slides were prepared using conventional immunohistochemical (IHC) stain and the magnification ranging from 50× to 400×. Each stain was graded as follows: “no inflammation” showed no neutrophils and inflammatory components, “Mild inflammation” showed single crypt abscesses, “Moderate inflammation” was indicated by frequent crypt abscesses. “High inflammation” was defined as increased inflammation of inflammatory cells (neutrophils) into the lamina propria.

RESULTS

Table 2. Endoscopic Pictures for CD and Histologic Slides for UC

- Lactoferrin’s level showed the highest sensitivity and linear score (R²) to endoscopic grading in patients assessed for IBD and IBS.
- A significant difference (p<0.05) was observed with lactoferrin between levels of mild and severe intestinal inflammation, and with no inflammation. CRP only showed a significant difference between severe and no intestinal inflammation.
- Lactoferrin and serum CRP showed a similar overall correlation to endoscopic and histopathology results.
- The CAI and CAI indices showed a poor correlation to endoscopic and histologic results.

REFERENCES CITED

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Figure 1. Correlation of Lactoferrin Levels to Endoscopy Score for Intestinal Inflammation

Figure 2. Correlation of CRP Levels to Endoscopy Score

Figure 3. Correlation of CRP Activity Index to Endoscopy Score

Table 1. Correlation between CRP, Activity Index to Endoscopy Score

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