

Marta S. Alexdóttir¹, Jacob Broder Brodersen^{2,3}, Michael Dam Jensen^{2,3}, Thomai Tsapanou-Katranara^{1,4}, Letizia Satriano¹, Anne-Christine Bay-Jensen¹, Morten A. Karsdal¹, Jens Kjeldsen^{4,5}, Joachim H. Mortensen¹

¹Nordic Bioscience A/S, Biomarkers and Research, Herlev, Denmark; ²Department of Internal Medicine, Section of Gastroenterology, Esbjerg Hospital – University Hospital of Southern Denmark, Esbjerg, Denmark; ³Department of Regional Health Research, University of Southern Denmark, Denmark; ⁴University of Southern Denmark, Department of Clinical Research, Odense, Denmark; ⁵Department of Medical Gastrointestinal Diseases, Odense University Hospital Odense, Denmark

BACKGROUND

- Crohn's disease (CD) is a chronic inflammatory bowel disease (IBD) characterized by immune cell infiltration and increased proteolytic activity, driving pathological changes in the structure and function of the intestines.
- Ileocolonoscopy (IC) is the gold standard for diagnosing and monitoring patients with CD but the invasive nature of IC renders it least acceptable from a patient perspective
- Pan-enteric capsule endoscopy (PCE) is an attractive and less invasive alternative

AIM

In this study, we investigated whether biomarkers of immune cell activity could identify patients with suspected CD, and if they associated with endoscopic disease activity at IC and PCE

METHODS

- **127 patients** were included from the Advanced Non-Invasive Diagnostics in Inflammatory Bowel Disease (**ANDI**) cohort, a study evaluating the diagnostic efficacy of PCE in subjects with clinically suspected CD
- Serum was drawn at inclusion
- Patients were examined with IC and PCE within a 2-week period from blood sampling, with CD diagnosed by IC
- Biomarkers of neutrophil activity (**CPa9-HNE: neutrophil-derived fragment of calprotectin**) and macrophage activity (**VICM: macrophage-derived fragment of citrullinated vimentin**) were measured in serum
- Endoscopic disease activity was assessed with SES-CD both for IC and PCE
- For SES-CD analysis, non-CD patients without malignancies from the cohort were used as reference

RESULTS

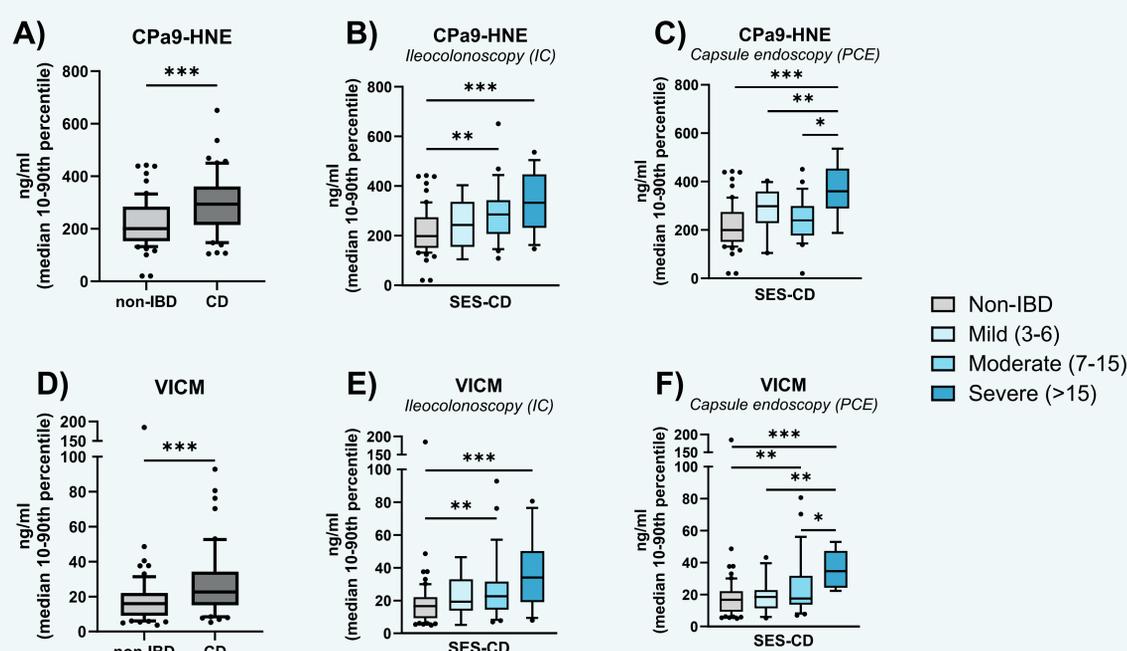


Figure 1. (A&D) CPa9-HNE and VICM were significantly elevated in patients with a confirmed CD diagnosis compared to non-IBD patients. (B-C&E-F) For SES-CD obtained from both IC and PCE, CPa9-HNE and VICM were significantly elevated in patients with moderate and severe disease compared to non-IBD. (C) CPa9-HNE was significantly elevated in patients with severe disease compared to moderate, based on PCE. (F) VICM was significantly elevated in patients with moderate and severe disease compared to mild, based on PCE. *p<0.05, **p<0.01, ***p<0.001.

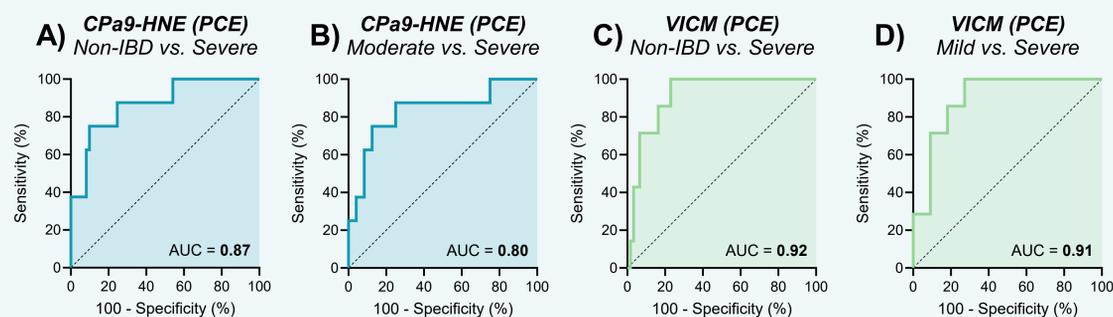


Figure 2. (A&C) Both CPa9-HNE and VICM had superior discriminative abilities between patients with severe disease based on PCE and non-IBD (AUC [95% CI]: 0.87 [0.77–0.94] & 0.92 [0.83–0.97]). (B) CPa9-HNE discriminated between moderate and severe disease according to PCE (AUC [95% CI]: 0.80 [0.60–0.93]). (D) VICM had superior discriminative capabilities between mild and severe disease based on PCE (AUC [95% CI]: 0.91 [0.66–0.99]).

DEMOGRAPHIC DATA

	Non-IBD	CD
Patients, n	65	48
Age, years (range)	28 (17-51)	24 (16-72)
Female, n (%)	52 (80)	29 (60)
Male, n (%)	13 (20)	19 (40)
BMI	25 (19-24)	23 (17-20)
Active tobacco use, n (%)	15 (23)	22 (46)
Fecal calprotectin µg/g (range)	281 (51-6000)	1346 (71-6000)
CRP, mg/L (range)	8 (0.2-122)	17 (0.6-98)
SES-CD (IC), n (%)		
Mild (3-6)		9 (19)
Moderate (7-15)	NA	26 (54)
Severe (>15)		13 (27)
SES-CD (PCE), n (%)		
Mild (3-6)		11 (23)
Moderate (7-15)	NA	24 (50)
Severe (>15)		8 (17)
Missing		5 (10)

CONCLUSIONS

CPa9-HNE [neutrophil activity] and VICM [macrophage activity] could identify patients with confirmed CD and were associated with endoscopic disease activity

Both biomarkers provided stronger discriminative performance when assessing disease activity by PCE

Biomarkers of neutrophil and macrophage activity may provide additional information to endoscopic assessment in the diagnosis and monitoring of CD