

Calprotectin

A non-invasive biomarker for inflammatory bowel diseases

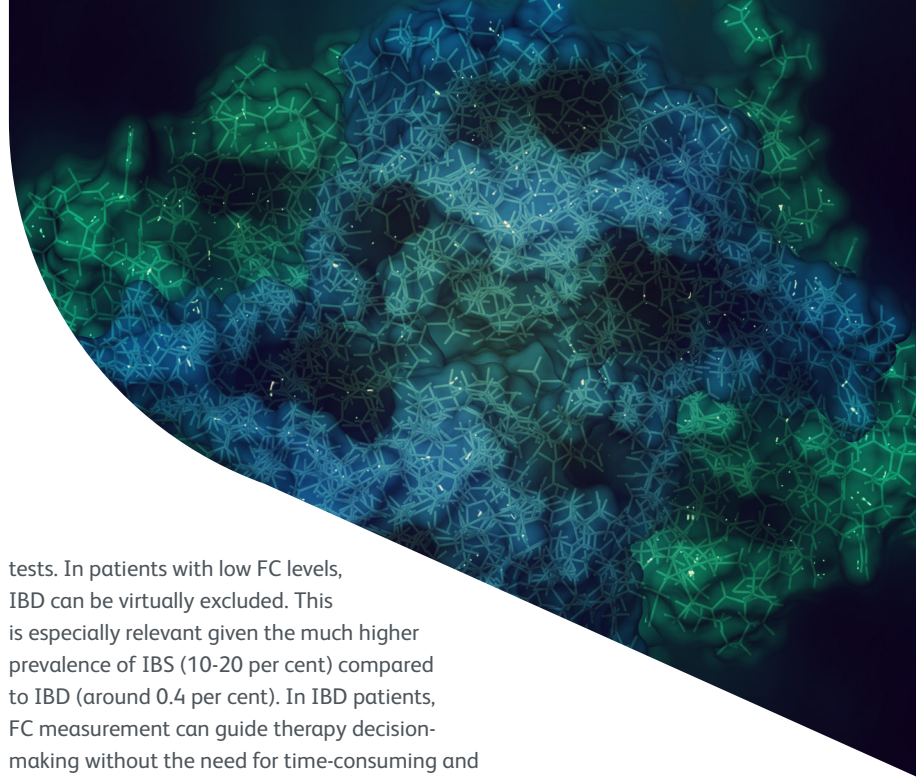
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FC can be measured quickly and efficiently in patient stool samples using ELISA

Faecal calprotectin (FC) is a sensitive marker of intestinal inflammation and is an important test for differentiating chronic inflammatory bowel diseases (IBD) from functional gut disorders such as irritable bowel syndrome (IBS). The FC level correlates with IBD activity and is, therefore, also suitable for monitoring the effectiveness of a treatment regime and for assessing the risk of relapses. Use of this non-invasive test in a routine setting can significantly reduce the total number of endoscopies performed. FC can be measured quickly and efficiently in patient stool samples using ELISA.

IBD versus IBS

Patients with abdominal pain or diarrhoea represent a large proportion of cases for gastroenterologists. The causes of these symptoms include IBD, such as Crohn's disease (CD) and ulcerative colitis (UC), and functional disorders such as IBS. It is not possible to differentiate between IBD and IBS based on symptoms alone. In order to obtain a definitive diagnosis, the inflammatory status of the intestinal epithelium is investigated using invasive imaging methods such as endoscopy. These procedures are, however, costly and unpleasant for patients. Moreover, more than half of adult and up to 70 per cent of paediatric



Antibodies in IBD can be determined by indirect immunofluorescence assays (IFA). Biochip mosaics containing combinations of different IFA substrates allow simultaneous determination of the different antibodies. The substrates encompass intestinal goblet cells, ethanol-fixed granulocytes, lactoferrin-specific granulocytes, lactoferrin-depleted granulocytes, rPAG1- and rPAG2-transfected cells and fungal smears of *Saccharomyces cerevisiae*. ASCA can also be determined by ELISA. The broad antibody analysis enables a high diagnostic rate for CD and UC.

Summary

Laboratory tests play an important role in the diagnosis of IBD. In recent years, FC has become an established biomarker for differentiating IBD from IBS and for monitoring IBD patients, while serological detection of different antibodies supports the differentiation between CD and UC. Testing for these biomarkers can avoid invasive and painful endoscopies for the patient. In particular, during the diagnostic workup only patients with elevated FC need to be referred for further invasive

tests. In patients with low FC levels, IBD can be virtually excluded. This is especially relevant given the much higher prevalence of IBS (10-20 per cent) compared to IBD (around 0.4 per cent). In IBD patients, FC measurement can guide therapy decision-making without the need for time-consuming and expensive endoscopies. FC is typically high during flare ups and lower during remission. In the future it is anticipated that FC will gain in importance for gastroenterological differential diagnostics and patient management. ✚

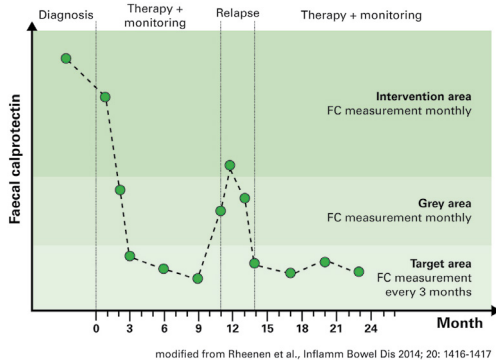


Figure 1: Faecal calprotectin in IBD monitoring

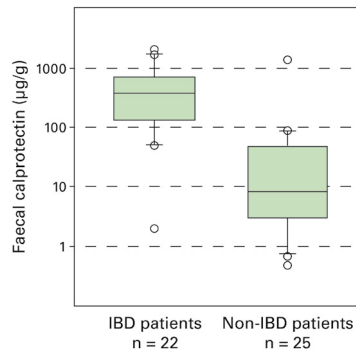


Figure 2: Faecal calprotectin levels in IBD and non-IBD patients

Year	2013	2014		2015	2016		2017	2018			2019
Organisation	NICE	AGA	DGVS	WGO	BSG	ECCO	ECCO	JSGE	ACG	DGVS	BSG
Country / region	UK	USA	Germany	World-wide	UK	EU	EU	Japan	USA	Germany	UK
Disease	IBD	CD	CD	IBD	IBD	CD	UC	IBD	CD	UC	IBD
Differential diagnostics IBD / IBS	■	■	■	■	■	■	■	■	■	■	■
Correlation with disease activity	□		□	□	□	□	□	□	□	□	■
Prognosis of relapse			■			■	□		□	■	■
Marker for mucosal healing					□	□					
Marker for postoperative relapse					□						■

■ recommended; □ mentioned; * Crohn's disease only

Table 1: Calprotectin in international guidelines for IBD diagnostics

In IBD patients, FC measurement can guide therapy decision-making without the need for expensive endoscopies