Accuracy of fecal M2-Pyruvate Kinase compared with fecal calprotectin to assess endoscopic severity in patients with inflammatory bowel diseases

G. Boschetti1, S. Boyer1, M. Chauvener1, K. Stroeymeyt1, N. Benech1, J. Draï1, B. Flourié1, S. Nancey1
1Lyon-Sud Hospital, Gastroenterology, Pierre-Benite, France, 2Lyon-Méditerranée Hospital, Biochemistry, Pierre Benite, France

Background: M2-Pyruvate Kinase (M2-PK) is a key dimeric enzyme involved in the glycolytic pathway and expressed in undifferentiated and proliferating tissues. Fecal M2-PK levels are increased in case of gut inflammation and therefore might represent a promising marker in inflammatory bowel diseases (IBD). We performed a head-to-head comparison of diagnostic accuracy of fecal M2-PK (fM2-PK) and fecal calprotectin (fCal) in predicting endoscopic disease severity in ulcerative colitis (UC) and Crohn’s disease (CD).

Methods: A total of 78 consecutive patients with IBD (26 UC and 52 CD) undergoing an ileo-colonoscopy were prospectively enrolled. All patients provided fecal samples for fCal (Bühlmann) and fM2-PK (Schebo Biotech) measurements. Endoscopic disease activities were scored independently according to the SES-CD score and the Rachmilewitz index, respectively for CD and UC (active disease defined as both scores >2 points). Accuracies of both fecal markers were determined using AUROC curves and sensitivities (Sen), specificities (Spe), predictive values (PV) and overall accuracies (OA) were also assessed at adjusted cutoffs determined by the ROC curves. Spearman rank correlations were also calculated.

Results: Whereas fM2-PK concentrations did not differ between endoscopically active and inactive CD patients, levels of fM2-PK were significantly higher in active UC when compared with those measured in inactive UC patients. In contrast, fCal concentrations differed significantly both in patients with active CD and UC when compared with those in patients with inactive disease. Accuracies of fM2-PK and fCal to predict endoscopic activity were higher in UC (AUROC 0.95 and 0.93, respectively) compared with those in CD (AUROC 0.60 and 0.80, respectively). fM2-PK concentrations were significantly correlated with endoscopic severity scores in UC and at a lesser degree in CD (correlation coeff r=0.75 (p<0.001) and r=0.37 (p=0.006); respectively). In addition, fM2-PK and fCal concentrations were also significantly correlated for UC (r=0.83, p<0.001) and for CD (r=0.43, p=0.001). Sen, Spe, PV and OA of both fecal markers are summarized in Table 1.

Conclusions: fM2-PK is a reliable, surrogate and promising marker, as or even more accurate as fCal, to identify UC patients with endoscopic active disease.

Poster presentations
**Abstracts of the 10th Congress of ECCO - European Crohn's and Colitis Organisation**

**S199**

**P247**

C-reactive protein is elevated with clinical disease activity during pregnancy in women with Inflammatory Bowel Disease

J. Bal, R. Foshaug, L. Ambrosio, K.I. Kroeker, L. Dieleman, B. Halloran, R.N. Fedorak, V.W. Huang*

*University of Alberta, Gastroenterology, Edmonton, Canada*

**Background:** Inflammatory bowel disease (IBD), Crohn’s disease (CD) or ulcerative colitis (UC), is a chronic inflammatory condition of the gastrointestinal tract that affects women in their reproductive years. Women with IBD have a risk of flaring their IBD during pregnancy, which is associated with worse maternal and fetal outcomes. C-reactive protein (CRP) is often used as a marker of IBD disease activity, but CRP can also be elevated during healthy pregnancies. In other words, it is unclear whether CRP can be used as a non-invasive biomarker of clinical disease activity in pregnant women with IBD.

The objective of this study was to determine if an elevated CRP is associated with clinical disease activity during pregnancy among women with IBD.

**Methods:** Female IBD patients (18 to 45yrs) were enrolled pre-conception (PC) or at each trimester of pregnancy (T[n]). At each clinic visit, women were grouped by clinical disease activity, using the Modified Harvey Bradshaw Index (mHBI) for Crohn’s disease, and the partial Mayo score (pMayo) for ulcerative colitis. Women with a mHBI≥5 or a partial Mayo score ≥2 were identified as having clinically active disease. CRP was also measured at each clinic visit; only patients who had previously documented CRP elevations (levels greater than 8.00 mg/L) with flares of their IBD were included for analysis. To examine the association of CRP with clinical disease activity, we compared CRP in women with clinically active and non-active disease, at each visit.

**Results:** Twenty-three women (13 UC and 10 CD) with median age 29.0 yrs who were seen over 52 clinic visits were included for analysis. There were 14 PC visits, 12 T1 visits (median gestational age 9.22 weeks), 13 T2 visits (median gestational age 20.57 weeks), and 13 T3 visits (median gestational age 31.86 weeks). The median CRP was numerically higher in women with clinically active disease compared to those with clinically inactive disease at PC (6.95 vs 2.80 mg/L; p=0.559) and T1 (24.75 vs 6.00 mg/L; p=1.000), respectively. However, the median CRP was lower in women with clinically active disease compared to those with clinically inactive disease at T2 (8.85 vs 12.40 mg/L; p=0.5923), and T3 (5.45 v. 11.90 mg/L; p=0.592), respectively.

**Conclusions:** Women with IBD who had clinically active disease during preconception and the first trimester of pregnancy had numerically higher CRP levels than women who had clinically inactive disease. This suggests that CRP remains a potential tool for assessing IBD disease activity in the early trimesters of pregnancy.

---

**P248**

Non-invasive Methods for monitoring mucosal healing in paediatric ulcerative colitis with usage of faecal calprotectin.

M. Meglicka, M. Szczepanski, M. Dadalski, J. Kierkus*

*The Children’s Memorial Health Institute, Department of Gastroenterology, Hepatology, Feeding Disorders and Paediatrics, Warsaw, Poland*

**Background:** Faecal calprotectin (FC) is a good marker in monitoring mucosal healing in adults with ulcerative colitis. Its concentrations in faeces is closely related to state of mucosa observed in endoscopy. There are a few studies concerning FC in mucosa status assessment in paediatrics population with UC. The aim of the study was to assess the usefulness of FC as a biomarker of endoscopy proven mucosal healing in monitoring of children with UC.

**Methods:** 66 patients with UC (F 36, M 30, ±14.16 years) were involved to the study and had elective colonoscopy performed, FC level and erythrocyte sedimentation rate (ESR) within a week before endoscopy measured. Each patient had also body mass index (BMI) and paediatric ulcerative colitis activity index (PUCAI) calculated. Mucosa status during endoscopy was assessed with Baron score. Full mucosal healing was defined as Baron score=0. We have identified two subgroups: those with full mucosal healing, and patients with inflamed gut mucosa. The receiver operating characteristic curve (ROC ) was used as a statistical method to establish cut-off points. The cut-off points are calprotectin threshold for simple model and posterior probability threshold for the linear discriminant analysis (LDA). The area under the curve (AUC) assesses the differentiation quality of the study group based on the model score. To increase sensitivity at high specificity the LDA with FC, ESR, BMI and PUCAI was taken.

**Results:** AUC for the simple model was 0.90. The selected cut-off level of discrimination between subgroup with full mucosal healing vs. subgroup with mucosal inflammation present was 189 µg/g with sensitivity 0.96 and specificity 0.75. When specificity was outweighed over sensitivity the cut-off point was 62 µg/g with sensitivity 0.50 and specificity 0.95. Due to the low sensitivity accompanying high specificity we used LDA with other parameters to increase sensitivity.