Reviewer's report

**Title:** Validation of the Diffusion-weighted Imaging Method for Activity Evaluation in Crohn's Disease Patients Underwent Magnetic Resonance Enterography

**Version:** 2  **Date:** 2 September 2014

**Reviewer:** Anthony BUISSON

Reviewer's report:

Dear editor

Fenq Qi et al. interested in the methods of detection of small bowel inflammation in Crohn's disease (CD).

MRI is a very exciting and promising tool in the detection and the assessment of small bowel inflammation in CD.

The authors aimed to compare MRI to enteroscopy which was chosen as reference.

**MAJOR POINTS**

1- The CE-CDAI was created initially and validated in separated the small bowel in only two segments, namely proximal and distal small bowel The authors have to detail that in the method section and to discuss it in the revised paper. (Gal E, et al. Assessment and validation of the new capsule endoscopy Crohn's disease activity index (CECDAI). Dig Dis Sci. 2008 Jul;53(7):1933-7. AND Niv Y et al. Validation of the Capsule Endoscopy Crohn's Disease Activity Index (CECDAI or Niv score): a multicenter prospective study. Endoscopy. 2012 Jan;44(1):21-6). The term of “modified CE-CDAI” could be considered.

2- In this cohort, no description of the population was given by the authors. They have to detail our characteristics population to check that this population was not a subgroup and then introduced some bias. A table should be included in the revised paper.

3- A major concern is the choice of the MRI score.

As it did not still exist a validated score to explore the entire small bowel, the selected the MR-score retrieved from the paper from Oussalah et al. Unfortunately this score is a non-validated score used in a paper interesting in DWI-MRE exclusively in the colon. This score is not dedicated to CD but was used both for CD and ulcerative colitis (UC). In addition, the authors added two additional items i.e. layer differentiation of DWI hyper-intensity and the presence of polypoid hyperplasia. They have to justify it and the term “modified-MR-score” should be considered.

Two scores were available to study CD involving the ileum.

The MAgnetic Resonance Index of Activity (MaRIA) retrieved from MRE protocol

The Clermont score retrieved from DWI-MRE was created using the correlation with MaRIA as reference (Buisson A, et al. Diffusion-weighted magnetic resonance imaging for detecting and assessing ileal inflammation in Crohn’s disease. Aliment Pharmacol Ther 2013; 37 : 537 – 45) and was validated both compared to MaRIA in CD involving the ileum (Hordonneau C et al. Diffusion-weighted magnetic resonance imaging in ileocolonic Crohn’s disease: validation of quantitative index of activity. Am J Gastroenterol. 2014 Jan;109(1):89-98) AND compared to the SES-CD (Caruso A et al. Diffusion-weighted magnetic resonance for assessing ileal Crohn’s disease activity. Inflamm Bowel Dis. 2014 Sep;20(9):1575-83)

The authors could improve highly their article in comparing the 3 scores (modified MR-score, MaRIA and Clermont score) in the 6 small bowel segments.

4- The retrospective design is a weakness because the modified-CE-CDAI had to be calculated retrospectively using the endoscopic reports. Were all the necessary items available on the endoscopic reports? The authors have to answer this question in the revised paper.

5- A major key point for a good monitoring of CD patients is acceptability/tolerability of the monitoring methods. The use of bowel cleansing the day before (2L of PEG) remains a major burden for IBD patients. Why the radiologists have chosen this procedure, has to be justified in the revised paper.

6- The term “validation” in the title is incorrect and should be removed.

7- The list of the references is not complete (see above). In addition, please prefer the initial publication rather than a review.

8- The authors should detail the inter-observer agreement regarding to MRI examination.

9- The authors should detail what they consider as a "low ADC". Please precise the threshold (1.9mm²/s?) and discuss it in the revised paper.

10- The correlation curves between modified MR-score and CE-CDAI should be included as figures.

MINOR POINTS

1- As no score was defined using enteroscopy in CD, they selected a modified CE-CDAI. They had the choice between CE-CDAI and the Lewis score, and they preferred the former. Although, in my opinion, they have taken the good decision, they should explain it in the revised paper.
2- In the abstract conclusion the term “predicts” should be substituted by “correlates”

3- I don’t understand what the authors wanted to say in the sentence: “Unfortunately, the ADCs of the inflammatory intestinal segments were significantly lower compared with those in the normal segments using all four b values (p < 0.01)(Fig 1b).” It was expected that ADC was decreased in the inflammatory segments. Could they revise this sentence for a better understanding?

4- The authors confirmed that b-value of 800 is the best value for DWI-MRE. Please discuss this result with the available literature (Hordonneau et al; Oto et al; Kyriu et al, Buisson et al., Oussalah et al...)

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

I declare that I have no competing interests