Deposited via The University of Sheffield.

White Rose Research Online URL for this paper:
https://eprints.whiterose.ac.uk/id/eprint/237044/

Version: Published Version

Article:

Narula, H. and Sidhu, R. (2026) Editorial: Celebrating women researchers and a focus on non-invasive modalities and innovation. Therapeutic Advances in Gastrointestinal Endoscopy, 19. ISSN: 2631-7745

https://doi.org/10.1177/26317745261416006

Editorial

Editorial: Celebrating women researchers and a focus on non-invasive modalities and innovation

Harveer Narula [iD] and Reena Sidhu [iD]

The number of females entering medical school has steadily increased,[1] but there remains a lag of females in academia and first and senior author positions.[2] Within gastroenterology and particularly endoscopy, there remains a dominance of males. Mastrorocco et al.[3] demonstrated that the percentage of females as both first and senior authors in high impact gastroenterology journals were significantly lower compared to males. There were differences based on specialty with larger number of female authors in hepatology and inflammatory bowel disease. The lowest rate of first female authors was seen in endoscopy. This special issue celebrating women called for female author submission's where three different topics were collated namely on the use of non-invasive modalities such as capsule endoscopy (CE) and faecal immunohistochemistry testing (FIT) and finally on innovation with the use of artificial intelligence (AI) within gastroenterology.

In adults, the diagnosis of coeliac disease (CD) relies on positive serology and confirmatory duodenal biopsy. In the first article of this series Topa et al. discusses the effectiveness of using a non-invasive modality; small bowel capsule endoscopy (SBCE) for monitoring and the ongoing management of CD particularly in refractory or equivocal cases of CD. The European Society of Gastrointestinal Endoscopy (ESGE) guidelines suggest that the main role of CE is to detect complications in the setting of CD.[4] The authors suggest that specific patient groups may benefit from more intense scrutiny, such as the older population with a late diagnosis of CD and those with suspected complicated CD.[5] Patients with complicated CD have a greater extent of SB involvement

on CE and a corresponding worse prognosis (refractory CD type 2 vs type 1 vs uncomplicated CD). A recent systematic review and meta-analysis recognises the use of SBCE for diagnosing CD demonstrating a reliable high diagnostic yield and safety profile highlighting its value as a key tool alongside standard serology and biopsy.[6] Similarly another systematic review also illustrated the potential use of SBCE in both diagnosis and follow-up of CD, as well as how it can be implemented as a complementary tool for monitoring suspected complications or cases of refractory CD.[7]

The recent 'Guidelines for Best practices in monitoring patients with established coeliac disease'[8] in fact do suggest that the extent of mucosa involved on SBCE can be a seen as a marker to decide if step-up therapy is needed in patients with refractory CD already on treatment. No doubt further studies in the next few years will likely result in change in current guidelines in supporting more widespread use of SBCE in these patients.[9]

The faecal immunochemical test (FIT), another non-invasive tool, is a biomarker that is recognised as a surrogate marker for colonic pathology. It is used as a triage tool in both symptomatic and asymptomatic patients for the detection of colorectal neoplasia.[10] However, its role within the small bowel is less clear. Judge et al.[11] demonstrated that a positive FIT in combination with iron-deficiency anaemia is useful for detection of pathology in the small bowel on CE.

The second article in this series by Oka et al.[12] investigates the use of both non-invasive modalities

Correspondence to:
Harveer Narula
Calderdale and Huddersfield NHS Trust, Salterhebble, Halifax HX3 0PW, UK
Hnarula22@doctors. org.uk

Reena Sidhu
Academic Department of Gastroenterology, Royal Hallamshire Hospital, University of Sheffield, Sheffield, UK

– SBCE and FIT in a prospective observational study which analysed the utility of FIT in the small bowel. A positive FIT ($>10\,\mu g/g$) had a relatively low sensitivity (34%) and specificity (54%). The diagnostic yield in the control group who had iron deficiency anaemia (IDA) without a FIT test was 37% suggesting that FIT did not confer any additional benefit as a triage tool for small bowel pathology in the setting of IDA. These findings are supported by an older meta-analysis highlighting the limited predictive value FIT in this setting due to its lack of diagnostic accuracy.[13] This study is pertinent as it tells us that we cannot simply rely on FIT for detection of pathology in the small bowel.

This in contrast to the use of FIT for colon capsule endoscopy (CCE), another non-invasive modality, but for the large bowel. The large NHS pilot[14] investigated the utility of CCE in the symptomatic and FIT positive population, suggesting that it is a good alternative modality in this cohort. One of the drawbacks of CCE is that patients may need a subsequent colonoscopy. Lei et al.[15] analysed the differing FIT thresholds and suggested that the most cost-effective FIT threshold was between 10 and $17.6\,\mu g$ Hb/g. This perhaps holds promise to guide the appropriate use of CCE in the setting of IDA and limiting those who may need subsequent colonoscopy. There is no doubt this modelled diagnostic pathway requires further validation and evaluation prior to implementation in routine clinical practice.

The final article in this series discusses the application of artificial intelligence (AI) within gastroenterology diagnostics[16] reflecting an advancement in not only non-invasive modalities but also innovation and technology.

The authors suggest using existing Gastrointestinal (GI) endoscopic databases to aid automated lesion detection and delineation. Databases and algorithms in Vietnam have been developed and, although in the early stages, have been proven to show some promise in clinical settings. There has been a surge of studies on the application of AI particularly for the detection of colorectal polyps, Barrett's oesophagus and other mucosal diseases.[17] However majority of these studies are from male authors and few from regions such as South-East Asia.

AI has also been studied within the small bowel and using CE[18–20] particularly in inflammatory bowel disease and CD.[21] In fact, AI has been explored as a pre-diagnostic triage tool for screening to identify patients at high-risk of CD prior to specific antibody testing. Schovsbo et al.[22] evaluated the potential use of machine learning (ML) to risk-stratify patients not yet undergone specific antibody testing, using routine biochemical blood parameters to predict the likelihood of coeliac antibody seropositivity. The study suggests AI could aid in triaging patients to find cases of undiagnosed CD when incorporating a diverse data sources, and to heighten predictive accuracy and establishing clinical feasibility. ML-driven triaging could also streamline referral pathways and optimise testing by focusing on higher-risk patients.

Gastroenterology continues to benefit from medical advancements, incorporating AI-assisted endoscopy and expansion of non-invasive modalities such as CE. Innovation has been shown to be effective in early detection, diagnosis and management alongside reducing reliance for invasive procedures. Strategies for improving triaging and diagnostic pathways help direct resources to patients most likely to benefit clinically from timely and targeted intervention.

This series celebrates women researches and demonstrates that female first authors, although less common are equally productive and at the forefront of advancement and innovation within gastroenterology. Providing equivalent opportunities in amplifying women's representation in authorship and leadership strengthens diversity of perspectives, broadening the scope, depth and clinical insight shaping the field of research. This inclusivity ensures gastroenterology research and practices benefits from diverse perspectives, driving clinical innovation and ultimately improving patient care and outcomes.

Declarations

Reena Sidhu: Conceptualization; Formal analysis; Supervision; Validation; Writing – original draft; Writing – review & editing.

ORCID iDs
Harveer Narula https://orcid.org/0009-0002-2898-4112

Reena Sidhu https://orcid.org/0000-0003-0820-2400

References

1. Moberly T. Number of women entering medical school rises after decade of decline. *BMJ* 2018; 360: k254.

2. Sidhu R, Rajashekhar P, Lavin VL, et al. The gender imbalance in academic medicine: a study of female authorship in the United Kingdom. *J Royal Soc Med* 2009; 102(8): 337–342.

3. Mastrorocco E, Terrin M, Migliorisi G, et al. Gender authorship in major American and European gastroenterology journals: the gap is still unfilled. *Endoscopy* 2024; 56(6): 397–403.

4. Pennazio M, Rondonotti E, Despott EJ, et al. Small-bowel capsule endoscopy and device-assisted enteroscopy for diagnosis and treatment of small-bowel disorders: European Society of Gastrointestinal Endoscopy (ESGE) Guideline – Update 2022. *Endoscopy* 2023; 55(1): 58–95.

5. Topa M, Corradi M, Elli L, et al. Navigating celiac disease with small bowel capsule endoscopy: current state and future horizons. *Ther Adv Gastrointest Endoscopy* 2025; 18: 26317745251340120.

6. Shapiro M and Niv Y. Diagnostic yield of video capsule endoscopy (VCE) in celiac disease (CD): a systematic review and meta-analysis. *J Clin Gastroenterol* 2025; 59(7): 598–606.

7. Rossi RE, Poletti V, Masoni B, et al. The role of videocapsule endoscopy in the diagnosis and follow-up of celiac disease: a scoping review. *Exp Rev Gastroenterol Hepatol* 2024; 18(10): 673–679.

8. Elli L, Leffler D, Cellier C, et al. Guidelines for best practices in monitoring established coeliac disease in adult patients. *Nat Rev Gastroenterol Hepatol* 2024; 21(3): 198–215.

9. Zammit SC, Elli L, Scaramella L, et al. Small bowel capsule endoscopy in refractory celiac disease: a luxury or a necessity? *Ann Gastroenterol* 2021; 34(2): 188.

10. Pin-Vieito N, Tejido-Sandoval C, de Vicente-Bielza N, et al. Faecal immunochemical tests safely enhance rational use of resources during the assessment of suspected symptomatic colorectal cancer in primary care: systematic review and meta-analysis. *Gut* 2022; 71(5): 950–960.

11. Judge C, Tighe D, Barry L, et al. Predicting pathology on small bowel capsule endoscopy: a good FIT. *Endoscopy Int Open* 2019; 7(11): E1379–E1385.

12. Oka P, Johnson CM, McAlindon M, et al. Does FIT have a role in the detection of small bowel pathology: a prospective study. *Ther Adv Gastrointest Endosc* 2024; 17: 26317745241301553.

13. Yung DE, Vijayan S, Avni T, et al. Fecal occult blood testing for the prediction of small-bowel pathology detected by capsule endoscopy: a systematic review and meta-analysis. *Annals Gastroenterol* 2017; 30(2): 186.

14. Turvill J, Haritakis M, Pygall S, et al. Multicentre study of 10,369 symptomatic patients comparing the diagnostic accuracy of colon capsule endoscopy, colonoscopy and CT colonography. *Aliment Pharmacol Ther* 2025; 61(9): 1532–1544.

15. Lei II, O'Connell N, Adu-Darko MA, et al. From stool to scope: optimising FIT thresholds to guide future panenteric capsule endoscopy and reduce colonoscopy burden in iron deficiency anaemia. *Cancers* 2025; 17(12): 1951.

16. Dao HV, Nguyen BP, Nguyen TT, et al. Application of artificial intelligence in gastrointestinal endoscopy in Vietnam: a narrative review. *Therap Adv Gastrointestinal Endoscopy* 2024; 17: 26317745241306562.

17. Rey JF. How artificial intelligence is revolutionising endoscopy. *Clin Endoscopy* 2024; 57(3): 302–308.

18. Spada C, Piccirelli S, Hassan C, et al. AI-assisted capsule endoscopy reading in suspected small

bowel bleeding: a multicentre prospective study. *Lancet Digital Health* 2024; 6(5): e345–e353.

19. Chen J, Xia K, Zhang Z, et al. Establishing an AI model and application for automated capsule endoscopy recognition based on convolutional neural networks (with video). *BMC Gastroenterol* 2024; 24: 394.

20. O'Hara FJ and McNamara D. Capsule endoscopy with artificial intelligence-assisted technology: real-world usage of a validated AI model for capsule image review. *Endoscopy Int Open* 2023; 11(10): E970–E975.

21. Chetcuti Zammit S, McAlindon ME, Greenblatt E, et al. Quantification of celiac disease severity using video capsule endoscopy: a comparison of human experts and machine learning algorithms. *Curr Med Imaging Rev* 2023; 19(12): 1455–1462.

22. Schovsbo SU, Sachs MC, Kriegbaum M, et al. Machine learning-based prediction of celiac antibody seropositivity by biochemical test parameters. *Sci Rep* 2025; 15(1): 23732.