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Original Research Article

Role of CT and MR enterography in the evaluation of inflammatory bowel disease

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ABSTRACT

Background: Inflammatory bowel disease (IBD) requires accurate diagnosis and assessment of disease activity for effective management. CT Enterography (CTE) and MR Enterography (MRE) are key imaging modalities for evaluating small bowel involvement in IBD. This study compares their diagnostic performance in detecting IBD, assessing disease activity, and identifying complications.

Methods: A prospective observational study was conducted on 48 patients with suspected or confirmed IBD. All patients underwent both CTE and MRE, followed by ileo-colonoscopy within two weeks to maintain consistency in disease status. Endoscopy served as the reference standard. Sensitivity, specificity and accuracy were calculated for each modality, with statistical analysis performed using IBM SPSS version 29.0. Interobserver agreement was evaluated using Cohen's kappa coefficient (κ).

Results: For diagnosing IBD, MRE showed a sensitivity of 86.6%, specificity of 92.7%, and accuracy of 89.65% (κ=0.73), while CTE demonstrated a sensitivity of 87.1%, specificity of 90.6%, and accuracy of 88.85% (κ=0.79). In detecting active disease, MRE achieved 84.5% sensitivity and 94.2% specificity (accuracy 89.35%, κ=0.76), whereas CTE showed 88.9% sensitivity and 83.7% specificity (accuracy 86.30%, κ=0.84). For chronic disease, MRE had 87.5% sensitivity and 91.2% specificity (accuracy 89.82%, κ=0.72), while CTE reported 88.3% sensitivity and 87.9% specificity (accuracy 88.10%, κ=0.77).

Conclusion: Both CTE and MRE provide high diagnostic accuracy for IBD. MRE is preferred in younger patients due to the absence of radiation, while CTE remains useful for rapid evaluation in acute or elderly cases.

Keywords: Inflammatory bowel disease, CT enterography, MR enterography, Diagnostic performance, Sensitivity, specificity, Active disease, Imaging modalities, Ileo-colonoscopy, Clinical management

INTRODUCTION

Inflammatory bowel disease (IBD) is marked by chronic, relapsing inflammation of the gastrointestinal tract and comprises of a spectrum of diseases, amongst which ulcerative colitis (UC) and Crohn's disease (CD) are the two major entities. IBD comprises two principal entities, CD and UC and is marked by chronic, relapsing inflammation of the gastrointestinal tract. Recurrent flares can substantially impair quality of life and drive significant morbidity. Although its precise cause remains uncertain, IBD is thought to stem from a complex interaction of genetic predisposition, environmental triggers, and dysregulated immune responses. Fast, accurate diagnosis and critically, the ability to distinguish active inflammation from chronic changes, is therefore essential for guiding therapy and predicting prognosis.[1–4] Cross-sectional imaging has become integral to this task. Computed tomography enterography (CT enterography) and magnetic resonance enterography (MR enterography) provide non-invasive, whole-bowel evaluation that gauge's disease extent, detects complications, and monitors treatment response. CT enterography is valued for its rapid acquisition, high spatial resolution, and excellent detection of acute complications such as perforations, abscesses, and strictures. Its dependence on ionizing radiation, however, is a notable limitation, particularly for younger patients and anyone likely to require repeat studies.[5–9] MR enterography removes that radiation risk while delivering superb soft-tissue contrast and functional assessment capabilities. It is especially advantageous for patients diagnosed early in life and for women of child-bearing age. Moreover, MR techniques demonstrate higher sensitivity and specificity for differentiating active from chronic inflammatory changes, evaluating extra-intestinal complications, and avoiding radiation-related hazards. Drawbacks include reduced accessibility, longer scan times, higher costs, and contraindications in individuals with severe claustrophobia or certain implants.[10,11] Taken together, CT and MR enterography offer complementary strengths in IBD assessment. Contemporary evidence shows both modalities achieve comparable sensitivity, specificity, and overall accuracy in diagnosing IBD and detecting active disease. Ultimately, the choice between them hinges on patient characteristics, anticipated need for serial imaging, and the specific clinical question.[12–14]

Association of biomarker cut-offs and endoscopic outcomes in Crohn's disease and its relevance

Biomarkers such as CRP, fecal calprotectin and specific imaging findings play a crucial role in monitoring disease activity and predicting endoscopic outcomes in Crohn's disease. These biomarkers provide a non-invasive alternative to endoscopy, which while considered the gold standard for assessing mucosal healing, is invasive and costly. Biomarker cut-offs, such as fecal calprotectin levels above 250 μg/g or elevated CRP, are strongly associated with active disease and can help identify patients requiring more intensive monitoring or treatment. Imaging biomarkers from modalities like MRE and CTE, such as bowel wall thickening, mucosal hyperenhancement and mesenteric fat stranding, have also shown moderate correlations with endoscopic findings, suggesting they can serve as non-invasive surrogates for assessing disease activity and complications.[3]

Integrating biochemical measures with imaging biomarkers offers a comprehensive, non-invasive way to monitor Crohn's disease, reducing the need for repeated endoscopies while supplying clinicians with richer data for decision-making. Interpreting findings from MRE or CTE alongside established biochemical indices improves the ability to predict active inflammation and, in turn, allows therapy to be adjusted more precisely. In this context, imaging serves not only as a diagnostic tool but as a key element of a multimodal management strategy, particularly when endoscopy is impractical or contraindicated. Continued research should validate these imaging markers against endoscopic benchmarks and further explore their combined use with biochemical tests to enhance patient care.[15,16] This study therefore compares CT enterography and MR enterography for assessing inflammatory bowel disease activity, using ileocolonoscopy as the reference standard. We examine each modality's sensitivity, specificity, and overall accuracy, and assess their capacity to identify chronic disease features and extra-intestinal complications. These insights will help determine the optimal imaging choice for different patient groups. By clarifying the respective strengths and limitations of each technique, the study seeks to guide clinicians toward the most appropriate imaging strategy for effective IBD management.[17]

METHODS

This prospective observational study ran from May 2024 through April 2025 at Institute of Medical Sciences and SUM Hospital, Bhubaneswar, Odisha, India. Its primary goal was to compare the diagnostic accuracy of CT enterography (CTE) and MR enterography (MRE) for assessing inflammatory bowel disease (IBD), using ileocolonoscopy as the reference standard. Both active and chronic disease phases, as well as extra-intestinal complications, were evaluated. The protocol was approved by the institutional ethics committee, and written informed consent was obtained from every participant.

Forty-eight adults (≥18 years) with either suspected or previously established IBD were enrolled. Inclusion required symptoms consistent with IBD, such as abdominal pain, diarrhoea, weight loss, or rectal bleeding or a prior diagnosis warranting further imaging to determine disease extent, activity, or complications. Key exclusions were contraindications to MRE (e.g., pacemakers, metallic implants, severe claustrophobia), pregnancy, and known hypersensitivity to the contrast agents administered in either CTE or MRE. All patients underwent both CTE and MRE and ileo-colonoscopy within a two-week period to minimize potential changes in disease status.

The order of imaging was randomized to prevent bias and standardized imaging protocols were followed. Results were interpreted by two independent radiologists with expertise in abdominal imaging, who were blinded to each other's findings. CTE was performed using a multi-detector 160 slice CT scanner (SOMATOM Scope, Siemens Healthineers). Patients were instructed to fast for at least 4-6 hours before the examination and a volume of 1500 ml (3 bottles) of neutral contrast agent (polyethylene glycol); one each at 60, 45 and 30 minutes before scanning. Fifteen minutes before scanning, participants were asked to drink an additional 500 ml of water to ensure adequate bowel distention. 150 ml of intravenous contrast material (Iohexol (Omnipaque 350), GE Healthcare) was injected at the rate of 4 ml/s, using a power injector, followed by a saline flush. Images were acquired in the arterial and portal venous phases using the following parameters: 120 kVp tube voltage, automatic tube current modulation, 2.5 mm slice thickness and 1.25 mm reconstruction intervals.

MRE was performed using a 1.5T MR scanner (MAGNETOM Avanto, Siemens Healthineers) Patients were similarly instructed to fast for 4-6 hours before the examination and were administered 1,500–2,000 ml of an oral neutral contrast agent over 45–60 minutes. An antiperistaltic agent, such as glucagon (1 mg intramuscularly), was administered before imaging to reduce bowel motility. Imaging sequences included T2-weighted single-shot fast spin echo, balanced steady-state free precession, diffusion-weighted imaging (DWI) and dynamic contrast-enhanced imaging. 0.5 mmol/ml of intravenous gadolinium-based contrast material (Vividscan (Meglumine Gadoterate)) at 3 ml/s was administered. Scan was taken after a 45-second scanning delay and images were obtained in axial and coronal planes with a slice thickness of 4 mm with 0 mm gap.

Imaging findings from CTE and MRE were independently reviewed by two experienced radiologists, blinded to clinical data and the results of the other modality. Each radiologist recorded the presence or absence of active inflammation, chronic disease changes (e.g., fibrosis or strictures) and extra-intestinal complications (e.g., abscesses, fistulas). In cases of disagreement, a final diagnosis was established by consensus. The sensitivity, specificity and accuracy of each modality were calculated using ileo-colonoscopy findings, mucosal biopsy results and clinical assessment as reference standards. Active disease was defined by imaging features such as bowel wall thickening (3 mm or more), hyperenhancement, increased vascularity and restricted diffusion on DWI while chronic disease was characterized by findings such as bowel wall fibrosis, strictures and fat wrapping.[18,19]

Statistical analysis was performed using IBM SPSS 29.0. Descriptive statistics were calculated for demographic and baseline characteristics. The diagnostic performance (sensitivity, specificity and accuracy) of CTE and MRE for the diagnosis of IBD and active disease was assessed using McNemar's test. Fisher's Exact Test was used to compare the two modalities with p values<0.05 considered statistically significant. The agreement between the two radiologists was evaluated using Cohen's kappa coefficient. The primary outcome measures were the sensitivity, specificity and accuracy of CTE and MRE for diagnosing IBD and detecting active disease. Secondary outcome measures included the assessment of chronic disease and extra-intestinal complications, as well as interobserver agreement between the two radiologists.

RESULTS

All 48 participants completed the study, and their demographic profiles closely matched those typically seen in patients with inflammatory bowel disease. Every patient underwent both CTE and MRE, enabling a direct comparison of the two techniques for detecting IBD and distinguishing active from chronic disease. Overall, CTE and MRE displayed similar diagnostic accuracy; only modest differences were noted in sensitivity, specificity, and inter-method agreement.

For the diagnosis of IBD as shown in Table 1, MR enterography demonstrated a sensitivity of 86.6% (95% CI: 64.15-93.32) and a specificity of 92.7% (95% CI: 74.15-97.68) and is also depicted visually in Figure 2a and b. The agreement between observers for MR enterography was 0.73 (95% CI: 0.66-0.78) with a p value of 0.0031, indicating a statistically significant difference compared to the clinical reference standard. CT Enterography showed a slightly higher sensitivity of 87.1% (95% CI: 67.21-91.82) and a specificity of 90.6% (95% CI: 67.03-92.54). The interobserver agreement for CT enterography was 0.79 (95% CI: 0.63-0.81), demonstrating moderate agreement between observers. For the assessment of chronic disease, as shown in Table 1, MR enterography demonstrated a sensitivity of 87.5% (95% CI: 68.04-89.30) and a specificity of 91.2% (95% CI: 70.52-95.50).

Table 1: Diagnostic performance metrics of MR enterography and CT enterography for inflammatory bowel disease, active disease & chronic disease.

Technique	Condition	Sensitivity (%)	95% CI (Sensitivity)	Specificity (%)	95% CI (Specificity)	Agreement	95% CI (Agreement)	Accuracy (%)	P value
MR enterography	IBD	86.6	64.15 - 93.32	92.7	74.15 - 97.68	0.73	0.66 - 0.78	89.65	0.0031
CT enterography		87.1	67.21 - 91.82	90.6	67.03 - 92.54	0.79	0.63 - 0.81	88.85	
MR enterography	Active disease	84.5	65.62 - 89.73	94.2	74.15 - 97.68	0.76	0.62 - 0.76	89.35	0.0083
CT enterography		88.9	69.63 - 95.66	83.7	64.72 - 87.47	0.84	0.65 - 0.87	86.30	
MR enterography	Chronic disease	87.5	68.04 - 89.30	91.2	70.52 - 95.50	0.72	0.65 - 0.85	89.82	0.0095
CT enterography		88.3	69.69 - 91.53	87.9	68.27 - 93.23	0.77	0.62 - 0.83	88.10	

Table 2: Demographic and clinical characteristics of the study participants (n=48).

Parameter	Category/Unit	Number (N)	%	Mean±SD
Age (in years)	—	—	—	36.8±12.4
Age group (in years)	18–30	14	29.2	—
	31–45	18	37.5	—
	46–60	10	20.8	—
	>60	6	12.5	—
Sex	Male	26	54.2	—
	Female	22	45.8	—
Duration of symptoms (months)	—	—	—	15.4 ± 7.8
Clinical presentation	Abdominal pain	40	83.3	—
	Diarrhea	35	72.9	—
	Weight loss	28	58.3	—
	Rectal bleeding	15	31.3	—
Type of IBD	Crohn's disease	28	58.3	—
	Ulcerative colitis	20	41.7	—
Disease activity (based on endoscopy)	Active	27	56.3	—
	Chronic / inactive	21	43.7	—
Extra-intestinal manifestations	Present	10	20.8	—
	Absent	38	79.2	—
Imaging modality order	CTE first	24	50.0	—
	MRE first	24	50.0	—
Average bowel wall thickness (mm)	—	—	—	7.2±3.1
CRP level (mg/l)	—	—	—	18.6±9.2
Fecal calprotectin (µg/g)	—	—	—	245±115
Final diagnosis confirmed by endoscopy	Yes	44	91.7	—
	No	4	8.3	—

Table 3: Comparative table with other study findings.

Study	Technique	Condition	Sensitivity (%)	Specificity (%)	Key findings
The study	MRE	IBD, active, chronic	86.6	92.7	MRE shows higher specificity for active disease detection.
	CTE	IBD, active, chronic	87.1	90.6	Slightly higher sensitivity for CTE.
Siddiki et al[10]	MRE	Small-Bowel Crohn's	90.5	Not reported	Similar sensitivity to CTE; avoids radiation but has lower image quality.
	CTE	Small-Bowel Crohn's	95.2	Not reported	Higher sensitivity; superior image quality but involves radiation.
Kim et al[11]	MRE	Crohn's Disease (CD)	91	71	High sensitivity; avoids radiation but slightly lower specificity than CTE.
	CTE	Crohn's Disease (CD)	89	80	Comparable sensitivity; better suited for older patients; involves radiation.
Starakiewicz et al[12]	MRE	Inflammatory bowel disease	~90	~90	Similar efficacy to CTE; preferred for younger patients to avoid radiation.
	CTE	Inflammatory bowel disease	~90	~90	More widely available and lower cost, but exposes patients to radiation.
Liu et al[13]	MRI (MRE and Enteroclysis)	Small bowel crohn's disease	~87	~91	High diagnostic accuracy; MRI preferred due to no radiation exposure.
	CT (CTE and Enteroclysis)	Small bowel Crohn's disease	~84	~91	High diagnostic accuracy but involves radiation.

Continued.

Study	Technique	Condition	Sensitivity (%)	Specificity (%)	Key findings
Granda et al[14]	MRE	Crohn's disease	Not Reported	Not Reported	MRE without anti-peristaltic agents demonstrates high diagnostic confidence and substantial agreement between readers.
	CTE	Crohn's disease	Not Reported	Not Reported	CTE has substantial agreement between readers; considered the gold standard for comparison.
Athanasakos et al[15]	MRE	Active Crohn's disease	87.5	79.3	Preferred imaging technique in children due to no radiation exposure.
	CTE	Active Crohn's disease	100	62.1	Recommended for acute emergencies or when MRI is contraindicated.
Joshi et al[16]	MRE	Crohn's disease	93	87	MRE more effective in diagnosing strictures; MRI severity index correlated strongly with disease activity.
	CTE	Crohn's disease	Not reported	Not reported	CTE less effective in detecting abnormalities compared to MRE.
Guglielmo et al[17]	MRE & CTE	Small bowel Crohn's disease	Not reported	Not reported	Emphasizes standardized nomenclature and guidelines for interpreting and reporting imaging findings.
Bruining et al[18]	MRE & CTE	Small bowel Crohn's disease	High (not quantified)	High (not quantified)	Both modalities show high sensitivity and specificity for detecting inflammation and complications; cross-sectional enterography is recommended for diagnosis and monitoring.
Paquet et al[19]	CT	Crohn's disease	Not reported	Not reported	CT-based biomarkers like bowel wall thickness (r=0.62), mesenteric fat stranding (r=0.49), mesenteric lymphadenopathy (r=0.51) show moderate to weak correlation with histological inflammatory activity.

The interobserver agreement for MR enterography was 0.72 (95% CI: 0.65-0.85) with a p value of 0.0095, indicating a statistically significant correlation with the clinical reference standard. CT enterography showed a slightly higher sensitivity of 88.3% (95% CI: 69.69-91.53) and a specificity of 87.9% (95% CI: 68.27-93.23). The interobserver agreement for CT enterography was 0.77 (95% CI: 0.62-0.83) and reflects strong to moderate agreement between observers. For the diagnosis of IBD, active disease and chronic disease, MR enterography demonstrated high accuracy values of 89.65%, 89.35% and 89.82%, respectively while CT enterography showed comparable accuracy values of 88.85% for IBD, 86.30% for active disease and 88.10% for chronic disease, indicating strong diagnostic performance for both modalities across these conditions.

Figure 4 depicts a scatter plot summarizing how MRE and CTE performed in diagnosing IBD and distinguishing active from chronic disease. Each "x" represents an individual patient; points are arranged horizontally by diagnostic category ("chronic disease," "active disease," and "IBD Diagnosis") and vertically by outcome, 1 for "true" (correct) and 0 for "false" (incorrect). Most symbols cluster tightly around the "true" line, highlighting the large proportion of accurate positive findings produced by both imaging techniques. In contrast, only a handful of points appear near the "false" line, indicating that incorrect negative results were uncommon.

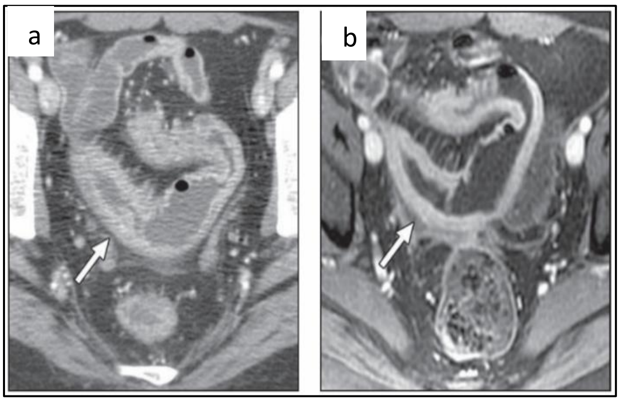

Figure 1 (a and b): Bowel wall thickening with mucosal enhancement.

Figure 2 (a and b): Homogenous mural enhancement.

This distribution mirrors the high sensitivities and specificities reported for MRE and CTE. The concentration of data points at the "true" level also shows strong concordance between the two modalities: in the vast majority of cases, MRE and CTE agreed on the presence of disease. The few scattered points near "false" outcomes suggest minimal disagreement or missed diagnoses. Taken together, the plot reinforces the overall high diagnostic reliability of both imaging methods across the various IBD presentations assessed.

Both MRE and CTE demonstrated strong diagnostic accuracy for the evaluation of IBD, including chronic and active disease. MRE achieved notably higher specificity in detecting active disease while CTE exhibited slightly greater sensitivity across the conditions tested. The statistically significant p values associated with both modalities underscore the reliability of these findings, particularly for diagnosing IBD and detecting active disease. Table 2 summarizes the baseline demographic and clinical profile of the study cohort. The mean age of participants was 36.8±12.4 years, with a slight male predominance (54.2%). Crohn's disease accounted for 58.3% of cases, while ulcerative colitis was observed in 41.7%.

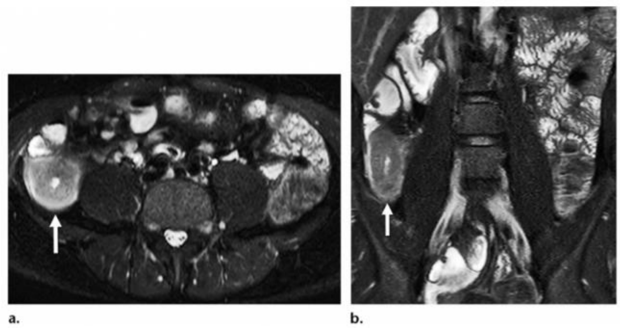

Figure 3: Severe (>10 mm) wall thickening with luminal narrowing (a) axial (b) coronal.

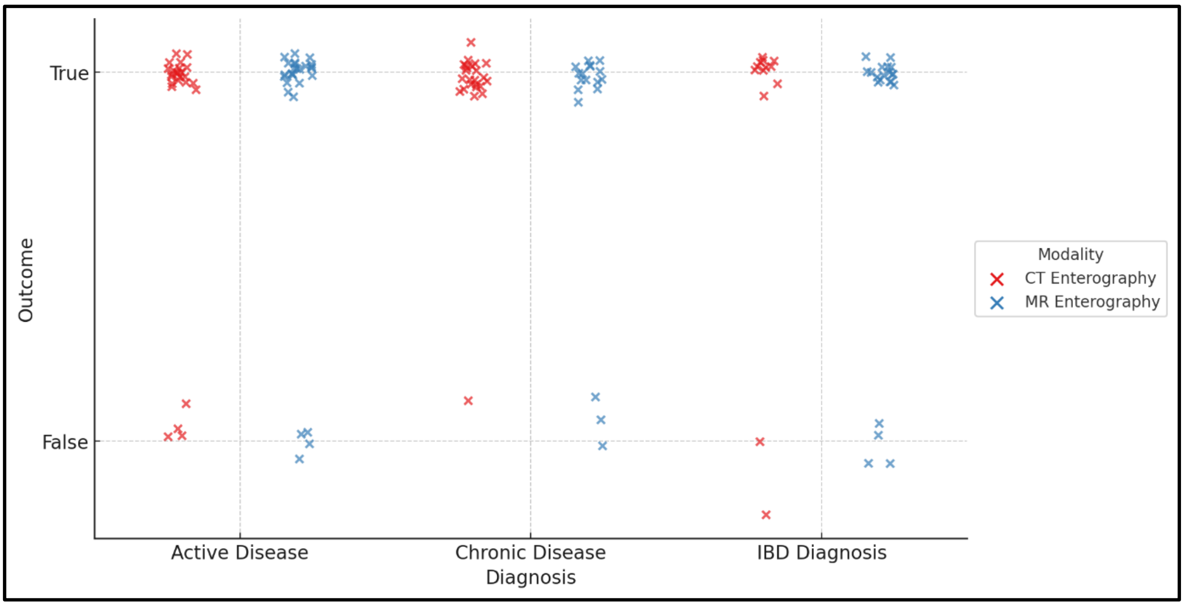

Figure 4: Cluster of true and false data points for IBD diagnosis and active disease.

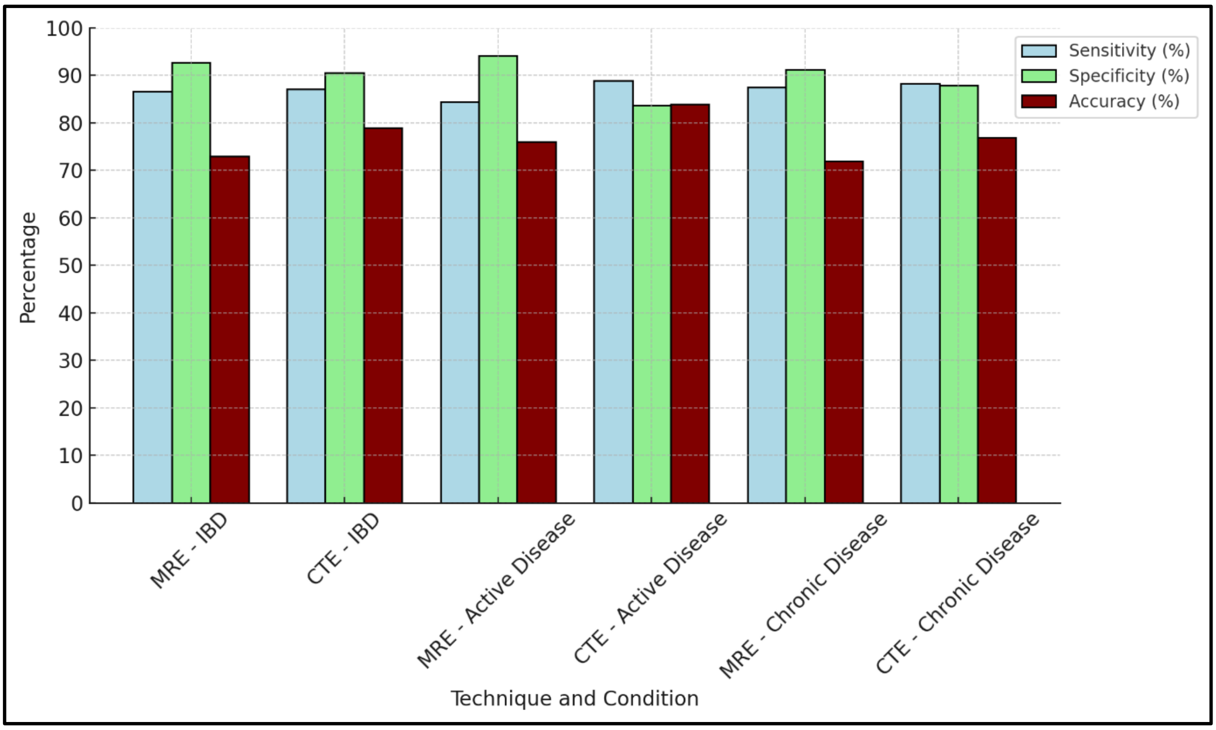

Figure 5: Sensitivity, specificity & accuracy of MR and CT enterography.

Given the strong performance metrics - high sensitivity, specificity and substantial inter-observer agreement - both MRE and CTE are validated as effective diagnostic tools for IBD. The choice between these modalities should be guided by patient demographics, clinical presentation and context, ensuring tailored and optimized patient care. These findings highlight the utility of both MR Enterography and CT Enterography in the comprehensive assessment of IBD, aiding clinicians in selecting the most appropriate imaging modality tailored to individual patient needs.[20]

DISCUSSION

The study aimed to evaluate the diagnostic performance of CTE and MRE in the assessment of IBD and active disease, focusing on their sensitivity, specificity and interobserver agreement. The results indicated that both CTE and MRE have high diagnostic accuracy for IBD and active disease with comparable sensitivity and specificity. However, several aspects of our findings can be contrasted with results from other studies to highlight similarities, differences and potential areas for further investigation, as shown in Table 3.

Our study demonstrated that MRE has a sensitivity of 86.6% and specificity of 92.7% for diagnosing IBD. These findings are consistent with several prior studies that have highlighted the utility of MRE in evaluating both luminal and extraluminal disease involvement. For example, Guglielmo et al reported similar sensitivity and specificity values for MRE, emphasizing its superior soft-tissue contrast and lack of ionizing radiation, which makes it particularly suitable for monitoring disease in younger patients or those requiring repeated imaging. This aligns with the consensus recommendations by Bruining et al, who suggest MRE as the preferred imaging modality for pediatric and young adult populations due to the cumulative risks associated with radiation exposure from CT Enterography (CTE).[8,10,21]

In contrast, the sensitivity (87.1%) and specificity (90.6%) of CTE in our study are also in agreement with previously reported data, such as that by Siddiki et al who demonstrated that CTE effectively identifies markers of inflammation like bowel wall thickening and hyperenhancement. Siddiki et al found CTE to have a high sensitivity of 95.2% for detecting small-bowel Crohn's disease, which is slightly higher than our results. This variation may be due to differences in patient populations or imaging protocols, including the use of anti-peristaltic agents or contrast enhancement techniques.[13]

However, while our results showed no significant difference between CTE and MRE in terms of overall sensitivity, specificity and accuracy for diagnosing IBD and detecting active disease, other studies suggest specific contexts where one modality may be superior. Joshi et al reported that MRE was more effective than CTE in detecting strictures and phenotypic changes in Crohn's disease. These findings are clinically relevant because the identification of strictures, fistulas, or penetrating disease can significantly influence patient management, including decisions about medical therapy or the need for surgical intervention. MRE's ability to detect these features more accurately may be due to its superior soft-tissue resolution and multiplanar imaging capabilities, which are less affected by bowel gas and can better delineate the extent and nature of the disease.[20]

Moreover, MRE offers a radiation-free alternative, which is particularly valuable in pediatric and young adult populations. The concern for radiation exposure is not trivial, as highlighted by Liu et al, who emphasized that MRI techniques, including MRE, should be considered first-line modalities given their comparable diagnostic accuracy (~87% sensitivity and ~91% specificity) and safety profile. This recommendation is further supported by Athanasakos et al, who noted that while CTE has an excellent sensitivity of 100% for detecting active Crohn's disease, its specificity is lower (62.1%), which could lead to over-diagnosis or unnecessary treatment in certain scenarios.[11] Therefore, the choice between MRE and CTE should be guided by clinical context, patient demographics and the need to minimize radiation exposure, especially in patients who require frequent monitoring or are at a higher risk of radiation-induced complications. The development of imaging biomarkers and scoring systems also provides opportunities to enhance diagnostic accuracy and patient management. For instance, Paquet et al highlighted that certain CT-based biomarkers, such as bowel wall thickness, mesenteric fat stranding and mesenteric lymphadenopathy, have moderate correlations with histological inflammatory scores (r=0.62, 0.49 and 0.51, respectively).[22] These correlations suggest that CT imaging can offer valuable insights into disease activity, particularly in settings where endoscopy may not be feasible or effective. However, our study did not utilize these biomarkers or an MRI severity index, which has been shown to correlate with clinical markers like faecal calprotectin and CRP. Future research should explore integrating these indices to provide a more comprehensive assessment of disease activity and enhance the standardization of imaging criteria in clinical practice.

The use of anti-peristaltic agents in imaging protocols is another area of interest. Granda et al found that omitting anti-peristaltic agents in MRE did not significantly impact diagnostic outcomes or confidence, suggesting that simplified protocols might be sufficient without compromising diagnostic accuracy. The study did not specifically address the use or exclusion of anti-peristaltic agents, but future research could examine how these agents impact image quality, examination duration and patient comfort. Simplifying imaging protocols could make MRE more patient-friendly and reduce the barriers to its use in routine clinical practice.

In terms of clinical management, our study primarily focused on sensitivity, specificity and accuracy metrics. However, other studies have demonstrated that MRE findings frequently lead to changes in treatment strategies, such as adjusting medications or recommending surgery. Joshi et al showed that MRE detected 14% more cases with abnormal findings than CTE, which could significantly alter management decisions, particularly in cases where the presence of strictures or other complications necessitates a change in therapeutic approach. This highlights the importance of not only assessing diagnostic performance but also understanding how these findings translate into clinical decision-making and patient outcomes.[11,23] Moreover, the study demonstrated substantial interobserver agreement for both CTE (0.79) and MRE (0.73). These values are in line with those reported in other studies, such as those by Bruining et al, who emphasize that agreement levels can vary depending on the experience of radiologists and the use of standardized reporting systems. Implementing standardized scoring systems, like those proposed in recent consensus guidelines, could improve diagnostic consistency and reduce variability across different clinical settings. Future studies should aim to incorporate these standardized systems and assess their impact on interobserver agreement and diagnostic accuracy.[8,10]

Lastly, our study suggests that both MRE and CTE are highly effective modalities for evaluating IBD with each offering specific advantages depending on the clinical scenario. MRE's lack of radiation, superior soft-tissue contrast and ability to detect strictures and other phenotypic changes make it particularly valuable for younger patients or those requiring frequent imaging. Conversely CTE's rapid acquisition and high sensitivity for detecting acute inflammation and greater availability may make it more suitable for certain acute or complex cases where MRI is contraindicated or less accessible.

Our findings which are supported by a comprehensive comparison with the existing literature affirm the high diagnostic accuracy of both MRE and CTE in the evaluation of IBD. The choice between these modalities should be tailored to the clinical context, patient demographics and specific diagnostic needs, considering the strengths and limitations of each. Future research should continue to refine imaging protocols, explore the integration of new diagnostic markers and scoring indices and assess how these modalities impact patient management to optimize their use in clinical practice.

CONCLUSION

This study demonstrates that both CTE and MRE are highly effective imaging modalities for diagnosing IBD and detecting active disease. Our findings reveal that CTE and MRE offer comparable diagnostic performance with similar sensitivity, specificity and accuracy. The high interobserver agreement for both modalities further underscores their reliability in clinical practice. While MR Enterography provides superior soft-tissue contrast and functional information without radiation exposure, making it particularly suitable for younger patients diagnosed early in life and for females of childbearing age.

MRE also showed a slightly higher specificity for detecting active disease, highlighting its potential as a preferred modality when distinguishing between active and chronic disease states is crucial. MRE is also preferred in suspected cases of peri-anal disease as imaging protocols allow excellent examination of the all-bowel segments (including the anus). CT Enterography does not well demonstrate small perianal fistulae. MRE is also preferred in suspected cases of peri-anal disease as imaging protocols allow confident assessment of the entire bowel including the anus. Small perianal fistulae are simply too difficult to see on CT. However, limitations such as longer imaging times, higher costs and accessibility issues must be considered when selecting the appropriate imaging approach.

CTE provides rapid imaging with excellent visualization of acute complications. It is particularly useful in patients over 50 years with an indication which is not a known case or clinically suspected IBD. CT enterography is a faster modality, is reliable and has relatively easier interpretation. However, it is the preferred imaging modality in elderly patients, or in patients with non-specific symptoms related to IBD. It is particularly useful in patients aged 50 years or more with any indication other than known or suspected IBD. CTE is fast, reliable and easy to interpret. In older patients, or in patients with questionable symptoms, it is the test of choice. However, its use of ionizing radiation necessitates careful consideration, particularly for younger patients and those requiring repeated examinations.

Although both modalities were effective in evaluating IBD and active disease, there remains a need for further studies that explore additional aspects such as the impact of imaging findings on clinical management, the use of standardized severity indices and cost-effectiveness. Incorporating these elements into future research could provide a more comprehensive understanding of how these imaging modalities can best be utilized in managing IBD. Ultimately, the choice between CTE and MRE should be guided by the patient's clinical presentation, demographic factors and specific diagnostic needs. Customizing the use of imaging modalities to individual patients will help maximize the diagnostic yield, minimize risks and optimize clinical outcomes in the management of IBD.

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