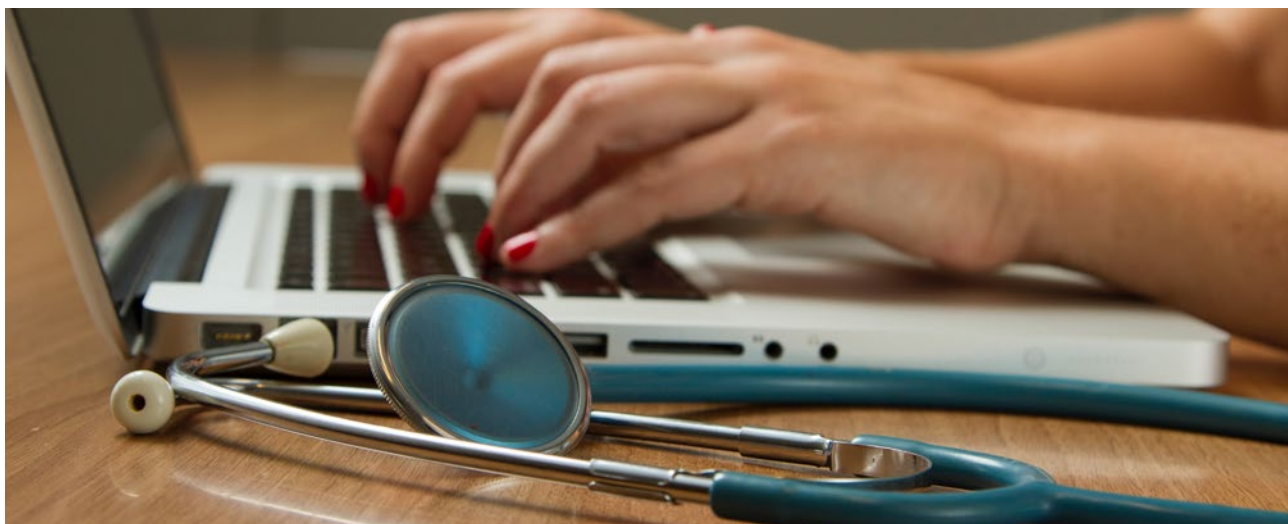# 🌐 Abstract Highlights

The following stories summarise a selection of the top abstracts presented at United European Gastroenterology (UEG) Week 2023. These highlights span several important topics, from artificial intelligence in colonoscopy, to endoscopy, irritable bowel syndrome, and inflammatory bowel disease.

Artificial Intelligence:
The Latest Generation of 4K Colonoscopy

IN MODERN colonoscopy practice, the human eye is enhanced by high-definition white-light visualisation, along with advanced imaging technology. However, quality is limited by the detection rate of suspicious lesions. With 4K resolution and computer-aided detection (CADe), based on artificial intelligence (AI), the next generation of endoscopes may be the answer. A research team led by Tomasz Gach, Jagiellonian University, Kraków, Poland, therefore sought to assess the effect of AI implementation in the latest generation of endoscopes and 4K visualisation, using a retrospective analysis. Results were presented at UEG Week 2023.

Specifically, the Olympus Endo-Aid CADe AI system (Olympus, Tokyo, Japan) was used, together with the latest X1 series endoscope set using LED lighting and 4K ultra high-resolution technology. Included patients were over 18 years old, and had undergone a colonoscopy in the past 5 years. The study population was divided into two groups, with Group 1 consisting of 1,000 consecutive tests performed using Endo-Aid CADe (Olympus), and Group 2 consisting of 1,000 consecutive tests without the CADe system.

A total of 2,000 participants were included in the analysis. The overall polyp detection rate (PDR) was similar in both test groups, yielding rates of 46.7% and 44.9%, respectively, for Group 1 and Group 2 (p=0.419). Furthermore, the adenoma (p=0.694) and advanced adenoma (p=0.861) detection rate changed unremarkably when AI was used. However, the mean polyp per patient score (MPP) was significantly higher in Group 1, increasing from 0.85 to 1.26 following the introduction of AI (p<0.001). Further analysis investigating each segment of the bowel revealed that PDR increased significantly in the left colon (29.3 versus 18.0%; p<0.001), with no difference identified in the other segments. Regarding MPP, a significant difference was identified exclusively in the right colon (0.33 versus 0.23; p=0.032) and the left colon (0.47 versus 0.28; p<0.001) when AI was used. Following adjustment to bowel preparation, the PDR and MPP were consistently higher in the AI group (29.3 versus 19.0%; p<0.001; and 0.48 versus 0.30; p<0.001, respectively).

> "Included patients were over 18 years old and had undergone a colonoscopy in the past 5 years."

To conclude, recent evidence is optimistic regarding AI efficiency in improving the quality and efficacy of colonoscopy. The results discussed by this study widen the overall perspective; however, future randomised control trials should elucidate the role of AI in colonoscopy. ●

Thigh Ultrasound Identifies High-Risk Patients with Systemic Sarcopenia

HIGH-RISK patients with systemic sarcopenia in cirrhosis can be identified with thigh ultrasound, according to new research presented at this year's UEG Week. Defined as low muscle mass and strength, sarcopenia is linked to adverse outcomes in cirrhosis, such as hepatic encephalopathy, infection, and increased hospitalisation.

Reza Saeidi, Royal College of Surgeons in Ireland (RCSI), Dublin, Ireland, and colleagues, recruited 124 patients to determine whether thigh ultrasound was a low-cost tool to identify sarcopenia in cirrhosis. The researchers recruited 45 patients with alcohol liver disease, along with 15 with non-alcoholic steatohepatitis, four with viral disease, three with autoimmune diseases, 10 with a combination of the aforementioned conditions, and three with other aetiologies. A total of 44 healthy controls participated.

The researchers used thigh ultrasound on the right thigh, moving from the top of the patella to the iliac crest, and bioelectric impedance analysis was performed as the validation standard. They also recorded gait speed, sit-to-stand time, handgrip, and Liver Frailty Index (LFI). The healthy controls could walk and stand faster, and had stronger handgrip.

Using thigh ultrasound, the researchers were able to determine that total muscle thickness was higher in the control group than in the cirrhosis group. Thigh ultrasound-measured total muscle thickness and superficial fat thickness also strongly correlated with bioelectrical impedance analysis height-adjusted skeletal muscle mass. The researchers further discovered that total muscle mass predicted skeletal muscle mass, and that frailty and LFI scores were negatively correlated with total muscle thickness.

The team concluded that thigh ultrasound is a rapid and low-cost tool to identify sarcopenia in cirrhosis, and that lower total muscle thickness is linked to reduced muscle function and increased frailty in cirrhosis. More studies are needed to see if thigh ultrasound can be used with biomarkers to determine which patients would benefit from intensive nutrition intervention. ●

> "The researchers used thigh ultrasound on the right thigh, moving from the top of the patella to the iliac crest."
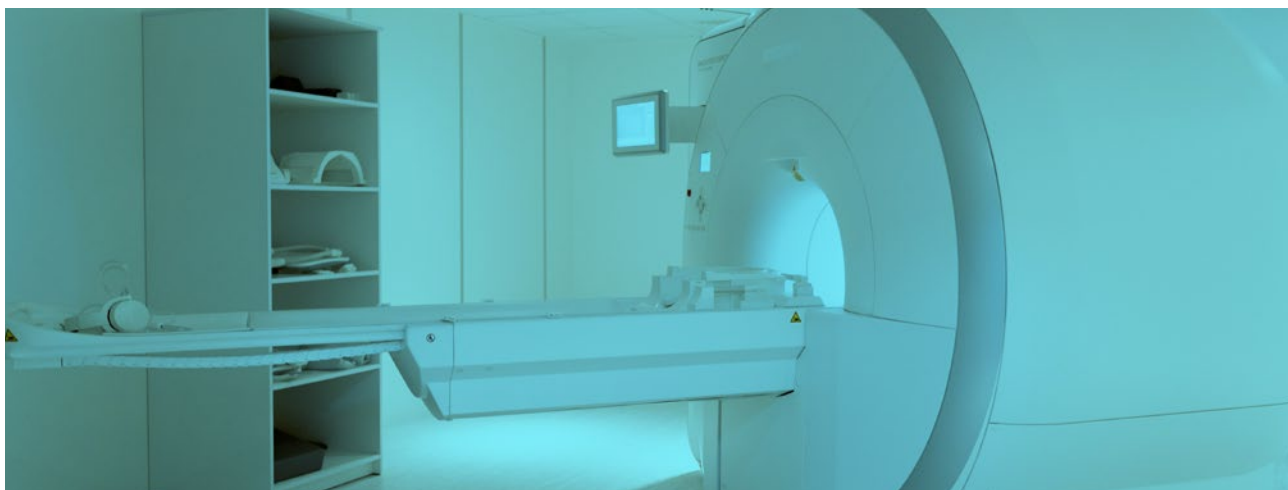
A New Approach to Selecting Early Rectal Cancer for Endoscopic Intermuscular Dissection

ENDOSCOPIC intermuscular dissection has been proven to be effective at removing deep submucosal invasive rectal cancers. However, a lack of knowledge and confidence in the anatomical characterisation of early rectal cancers (ERC) means that selecting which tumours are suitable for this technique is a challenge, both endoscopically and radiologically. Research presented at UEG Week in Copenhagen, Denmark, explored whether the application of a novel systemic approach for staging rectal cancer lesions using MRI can identify tumours suitable for local excision in the intermuscular plane more accurately.

The study involved a 1-day training session held by an expert radiologist in the Netherlands, who had developed and validated the systematic reporting approach for assessing ERC on MRI. After this session, the 12 training radiologists, as well as the expert radiologist, reported a retrospective case series of pseudonymised MRI scans, blinded to pathological outcome data. Scans were derived from consecutive patients from two academic centres in the Netherlands who were suspected of having submucosal invasive rectal cancer at optical diagnosis between 2018–2022. All scans were matched to clinical and pathological outcome data.

Of the 246 patients (median age: 67 years; 71.1% male) included in the study, it was found that 186 would retrospectively have been suitable candidates for a local excision in the intermuscular plane based on the pathology data (≤pT2 limited to the circular muscularis propria). MRI accuracy in identifying these tumours as locally resectable was 81.7% (95% confidence interval [CI]: 76.3–86.3) in expert radiologist diagnosis, and 78.5% (95% CI: 72.7–83.5) for the study radiologists (range individual radiologists: 64.1–94.6%). The primary outcomes included sensitivity, specificity, positive predictive value, and negative predictive value, which were 86.0%, 68.3%, 89.4%, and 61.2% for expert diagnosis, and 80.5%, 72.4%, 90.0%, and 54.6% for trained study radiologists, respectively.

Though previously MRI was not considered useful for the identification of ERC suitable for endoscopic local excision, this research suggests that it is accurate and reproducible. This approach may improve care by enabling better case selection for endoscopic intermuscular dissection; however, further research is needed to assess the clinical impact of this new approach. ●

"This approach may improve care by enabling better case selection for endoscopic intermuscular dissection."

Prevalence of Irritable Bowel Disease Impacted by Changes in Definitions

CHANGES in the symptom-based definitions of irritable bowel syndrome (IBS), especially the abdominal pain frequency threshold, impact the global prevalence of the disease, according to an abstract presented at UEG Week 2023. Previous data has shown that the use of the current Rome IV criteria substantially lowered IBS prevalence. Navkiran Tornkvist, Sahlgrenska University Hospital, Gothenburg, Sweden, and colleagues, analysed how different changes in diagnostic criteria influence this prevalence.

The study included 54,127 individuals who completed the internet survey in the Rome Foundation Global Epidemiology Study (RFGES; 49.1% female; mean age: 44.3 years; range: 18–97 years). Rome IV and Rome III diagnostic questions, quality of life (PROMIS-10 QoL), healthcare utilisation ("ever consulted a doctor about a bowel problem?"), and IBS symptom severity scale (IBS-SSS) were used. The team applied the following different definitions to diagnostic criteria: using bloating/abdominal distension as a proxy for discomfort; removing the requirement that abdominal pain and/or discomfort and changes in bowel habits should be associated in time; changing the frequency threshold of abdominal pain and/or discomfort; and adding discomfort to the definition.

Results showed that prevalence of IBS was 10.1% with Rome III criteria compared to 4.1% with Rome IV criteria. Prevalence rates were doubled by lowering the frequency threshold for abdominal pain and/or discomfort from ≥once per week to ≥2–3 days a month. Prevalence rate stayed similar when using the Rome III symptom definition of abdominal pain and/or discomfort with the Rome IV frequency threshold (≥once a week). Furthermore, prevalence rate was not influenced by the removal of the required association in time between changes in bowel habits and abdominal pain and/or discomfort. Finally, the team noted a female predominance, increases in healthcare utilisation, and reduction in QOL compared with the general global population, and on average, moderate symptom severity for all evaluated definitions.

> **"Prevalence of IBS was 10.1% with Rome III criteria compared to 4.1% with Rome IV criteria."**

The team concluded that relatively minor changes in symptom-based definitions of IBS substantially shape global prevalence, with alterations in abdominal pain/discomfort frequency threshold having the highest impact. This data will aid the definition of the Rome V criteria. ●

The Link Between Physical Activity and Inflammatory Bowel Disease

PHYSICAL activity (PA) in early childhood is not significantly associated with later risk of inflammatory bowel disease (IBD), according to research presented at UEG Week 2023. While PA has been inversely associated with IBD risk in adults, studies on paediatric populations have been lacking.

Tereza Lerchova, University of Gothenburg, Sweden, and colleagues, used population-based cohorts that followed children from birth (1997–2009) to 2021. Using questionnaire responses received from the ABIS and MoBa cohorts, the researchers collected data on the amount of screen time (ST) and degree of PA of children aged 36 months. Using the patient registers from Norway and Sweden, the researchers defined IBD as ≥2 diagnostic records of the disease.

There was a total of 65,978 participants with data on PA and ST from both cohorts (ABIS: n=8,810; MoBa: n=57,168). During the 928,981 person-years follow-up, 266 participants were diagnosed with IBD (ABIS: n=65; MoBa: n=201). The researchers adjusted for parental IBD, immune-mediated comorbidities, education level, maternal/paternal origin, maternal smoking during pregnancy, and the child's sex.

Children were put into high and low PA groups, and the results indicate that there was no significantly increased risk of IBD (adjusted pooled hazard ratio [HR]: 1.12; 95% confidence interval [CI]: 0.87–1.43), Crohn's disease (adjusted pooled HR: 1.00; 95% CI: 0.67–1.48), or ulcerative colitis (adjusted pooled HR: 1.23; 95% CI: 0.66–2.32). High versus low STs also showed no link to later IBD (adjusted pooled HR: 0.91; 95% CI: 0.71–1.17), Crohn's disease (adjusted pooled HR: 0.98; 95% CI: 0.58–1.66), or ulcerative colitis (adjusted pooled HR: 0.75; 95% CI: 0.28–1.98).

The MoBa cohort also had data for children at 18 months (n=75,254), where 256 participants developed IBD during follow-up. However, sub-analysis showed that PA and ST were not significantly linked with later IBD risk. Therefore, PA in early life was not significantly associated with later IBD risk. ●

> "While PA has been inversely associated with IBD risk in adults, studies on paediatric populations have been lacking."

Phenotypic-Genotypic Associations of Abdominal Pain in Children

DESPITE abdominal pain being the most commonly experienced symptom in children, its pathophysiology is heterogenous and its mechanisms are not entirely understood. Furthermore, reports of genetic associations for abdominal pain in children are rare. New research presented at UEG Week in Copenhagen, Denmark, on the 17th October, employed robust stratification in a large sample in order to understand the determinants of abdominal pain in children.

The study involved analysing the frequency of comorbidities of 1,247 children who experienced abdominal pain (average age: 8.4±1.1 years old; male/female: 615/659) from the Born in Bradford birth cohort, registered between 2007–2011. They were then clustered using the unsupervised machine-learning algorithm, and genome-wide association studies were used to seek significant variants of single nucleotides polymorphisms responsible for differences between the clusters, using 6,488 children (male/female: 3,375/3,113) without abdominal pain as the control.

Researchers divided the children with abdominal pain into three clusters: 137 in cluster one (10.8%), 677 in cluster two (53.1%), and 340 in cluster three (26.7%). The children in cluster one had allergic diseases (99.3%) and all their mothers also had allergic diseases. The second cluster contained children whose mothers' comorbidities, such as abdominal pain (70%), allergic diseases (40%), and migraine (34%), were the highest compared to the other clusters. In cluster three, the frequencies of comorbidities, including allergic diseases and mothers' comorbidities, were very low.

Genome-wide association studies showed that there were two, one, and four single-nucleotide polymorphisms with genome-wide significance ($p < 5.0 \times 10^{-8}$) in clusters one, two, and three, respectively. Enrichment analysis revealed that *ARPC5* and *CLDN* genes associated with tight junction may account for abdominal pain in cluster one. Genes associated with bile acid biosynthesis might also be associated with abdominal pain in clusters one and two.

These findings suggest that there are three distinct phenotypes associated with abdominal pain in children, which may require a new therapeutic approach according to their aetiology and pathophysiology. ●

> **"The study involved analysing the frequency of comorbidities of 1,247 children who experienced abdominal pain."**