A RESEARCH REVIEW™
SPEAKER SERIES

Brain to tummy: From functional abdominal pain to abdominal migraine

Making Education Easy 2025

About the speakers

Dr Elena Ryniker

Dr Elena Ryniker is a specialist gastroenterologist at Auckland City Hospital, dedicated to diagnosing and managing a wide range of gastrointestinal and liver conditions. With a medical degree earned in 2002 and Fellowship of the Royal Australasian College of Physicians (FRACP) in 2022, she combines clinical expertise with a patient-centred approach to care. In addition to her work at Auckland City Hospital, Dr Ryniker also sees patients in private practice.

Abbreviations used in this review

CRP = C-reactive protein
FAPDS = functional abdominal pain disorders
FODMAP = fermentable oligosaccharides, disaccharides, monosaccharides and polyols
IBD = inflammatory bowel disease
IBS = irritable bowel syndrome
NSAID = non-steroidal anti-inflammatory drug

This publication summarises a presentation by Dr Elena Ryniker who spoke at the 2025 Goodfellow Symposium in Auckland in March. Elena spoke about the gut brain axis, abdominal pain from common and uncommon causes, and the causes, symptoms and treatment of abdominal migraine. This review is sponsored by Allevia Hospitals.

Introduction

Dr Ryniker explained that abdominal pain is a very common presentation in general practice, with various management strategies and diagnostic outcomes. A meta-analysis from Canada found the prevalence of abdominal pain in primary care to be 2.4%, with women of all age groups more likely than men to report abdominal pain.[1] The analysis identified that most cases of abdominal pain are managed in primary care, with only 20% requiring further investigation, with a referral rate of 11%.[1] Common diagnoses include gastroenteritis, irritable bowel syndrome and urological issues, but one-third of cases have unspecified causes.[1]

Estimates suggest that approximately 9% of childhood primary care visits are due to acute abdominal pain.[2] A study from the Netherlands reports that among children reporting to primary care for abdominal pain, 78.7% fulfilled the criteria for chronic abdominal pain during follow-up.[3] Approximately one-third of children with non-acute abdominal pain undergo diagnostic testing, but many do not receive a specific diagnosis. Only a small percentage of children are referred to secondary care, and follow-up consultations are not consistently conducted. Common causes of abdominal pain in children include constipation, viral syndromes, gastroenteritis, and upper respiratory infections.[2]

Making a diagnosis

Dr Ryniker emphasised the importance of taking a thorough history in patients with recurrent abdominal pain. She explained that red flags in recurrent abdominal pain include interrupted sleep due to abdominal pain, haematemesis, dysphagia, jaundice, anaemia, B symptoms (including weight loss and night sweats), change in bowel habits, and rectal bleeding. She pointed out that a lot of knowledge can be gained from a simple diagnostic work up including the following:

- Complete blood count
- Iron studies
- Liver function tests and albumin
- Kidney function (urea and electrolytes) and mid-stream urine
- Imaging
- C-reactive protein (CRP)
- Lipase
- *Helicobacter pylori* stool antigen (off proton pump inhibitor therapy)
- Faecal calprotectin (assess for inflammatory bowel disease if diarrhoea is present).

Dr Ryniker stressed the importance of looking for evidence of anaemia, which can be present in conditions such as malignancy, IBD and in patients taking high doses of NSAIDs. She added that liver function tests with investigation of albumin levels are particularly important, especially in conjunction with CRP and faecal calprotectin

levels, as this can rule out IBD. According to Dr Ryniker, if a patient has a normal full blood count, a normal CRP <5 mg/L, a normal albumin level, and a faecal calprotectin level <50 µg/g, the chance of having IBD is less than 1%. She added that faecal calprotectin should only be requested in patients with loose bowel motions of over 4-weeks duration and that a faecal calprotectin level >250 µg/g is suggestive of IBD. She pointed out that *H. pylori* can be responsible for elevations in faecal calprotectin levels in the range of 60-100 µg/g. In patients with a faecal calprotectin level between 50 µg/g and 250 µg/g, she suggests retesting after 4 weeks and referring the patient to a gastroenterologist for a colonoscopy if the value remains above 250 µg/g.

Dr Ryniker explained that once structural causes of abdominal pain have been ruled out, functional abdominal pain disorders (FAPDS) must be investigated. FAPDS feature recurrent abdominal pain but do not have a structural cause. These disorders include IBS, functional dyspepsia, abdominal migraine (this is predominantly a childhood illness), and functional abdominal pain – not otherwise specified. The different symptoms associated with each of these FAPDS are outlined in **Table 1**.[4]

Table 1. Symptoms associated with functional abdominal pain disorders (FAPDS) according to ROME IV criteria.[4]

Irritable bowel syndrome (IBS)	Functional dyspepsia	Abdominal migraine	Functional abdominal pain – not otherwise specified
Characterised by abdominal pain associated with changes in bowel movements	Presents with upper abdominal discomfort, early fullness, and bloating	Involves recurrent bouts of midline abdominal pain with migraine-like symptoms lasting >1 hour	Encompasses chronic abdominal pain without a clear cause

Abdominal migraine

Dr Ryniker explained that neurovisceral interaction (otherwise known as the brain-gut axis) plays a key role in FAPDS and emphasised the importance of identifying the presence of abdominal migraine early in order to avoid unnecessary investigations and to provide timely and effective treatment. She pointed out that there is an increasing understanding of the brain-gut axis and the role of the vagal nerve and the gut microbiome in mental health. She added that the pathophysiology of abdominal migraine is multifactorial, involving complex interactions between the gut-brain axis, genetics, gastrointestinal motility, and the gut microbiome.

It is estimated that approximately 9% of children experience migraines and 0.2-4% of the paediatric population is affected by abdominal variants of migraine (such migraine can persist or manifest in adults, but it is uncommon in the adult population). Females have a higher incidence of migraines and associated FAPDS.

Dr Ryniker explained that abdominal migraine is often misdiagnosed as IBS or anxiety. She added that there is a strong genetic link to migraines and that in some cases abdominal migraine can develop into a full-blown migraine with aura as the child grows older. The International Headache Society has developed diagnostic criteria for abdominal migraine (**Figure 1**).[5]

Dr Ryniker pointed out that patients presenting with abdominal migraine are predominantly aged 4-10 years. She recommends the following pragmatic definition of abdominal migraine, adapted from several different sources including the International Classification of Headache Disorders definition.[4-6]

- Episodic central abdominal pain, usually lasting >1 hour
- Episodes interfere with normal activity
- Episodes occur with one or more of pallor, anorexia, nausea, vomiting, photophobia, or headache, or are associated with other episodic syndromes (such as cyclical vomiting and migraine limb pain)
- Person is well between episodes
- Normal physical and developmental examination.

Dr Ryniker presented a useful table outlining the features of abdominal migraine versus the other types of FAPDS (**Table 2**). She explained that triggers for IBS include foods such as cauliflower and onion (foods that are avoided on a FODMAP diet) and that bloating and stool changes are often present. With functional dyspepsia, which is more prevalent in the adult population than in children, post-prandial pain is a common symptom, as is fullness and nausea. Dr Ryniker commented that it is unusual for vomiting to occur in patients with functional dyspepsia, unless it is self-inflicted. She explained that chronic low-grade abdominal pain is a common feature of functional abdominal pain – not otherwise specified, and anxiety and fatigue are often seen. In patients with abdominal migraine, pain is in the midline and cyclic, with completely symptom-free periods in between, and stress and sleep disruption are often present.

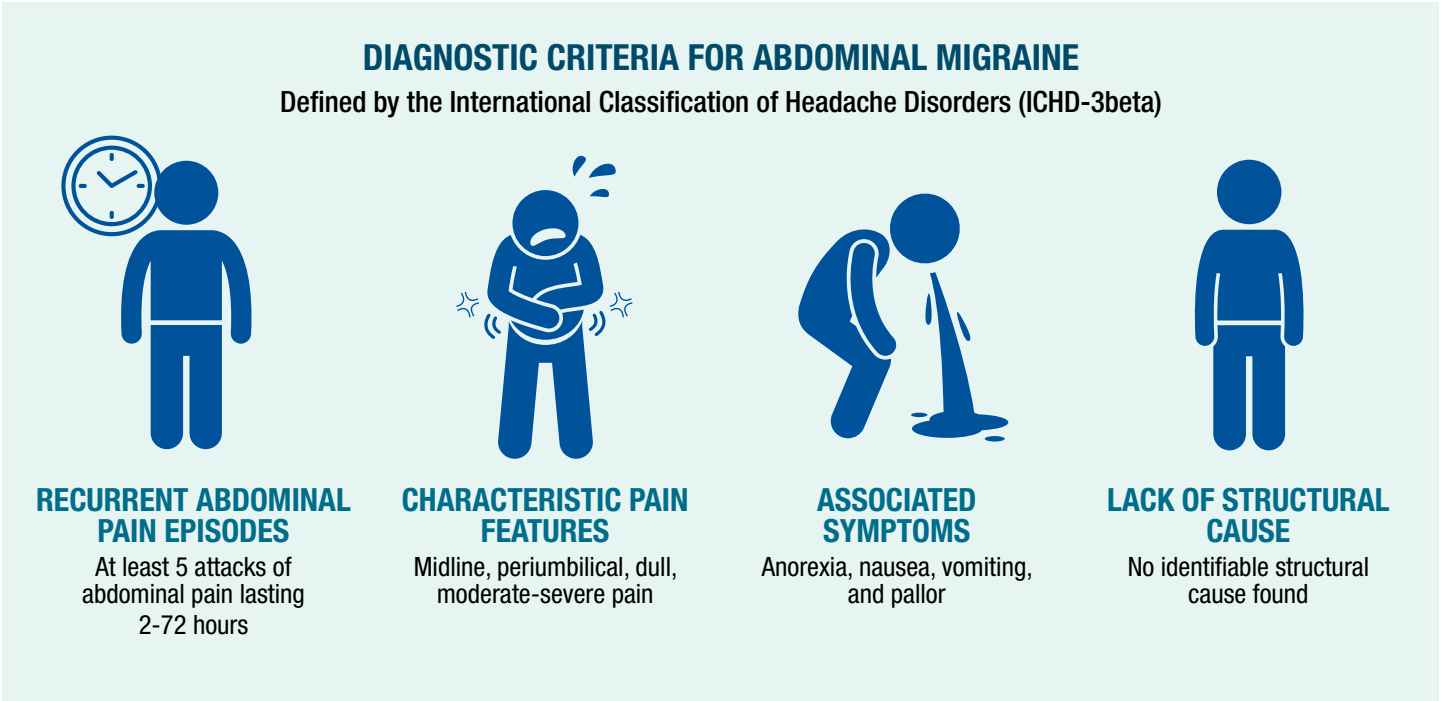

Figure 1. The International Headache Society's diagnostic criteria for abdominal migraine.[5]

Table 2. Comparison of functional abdominal pain disorders and abdominal migraine

Feature	IBS	FD	FAP-NOS	AM
Pain Timing	Daily	Post-meal	Chronic	Cyclic
Location	Lower Abdomen	Upper Abdomen	Diffuse	Midline
Triggers	Food, stress	Eating	Unclear	Stress, sleep disruption
Associated Features	Bloating, stool changes	Fullness, nausea	Anxiety, fatigue	Pallor, nausea, vomiting
Migraine Link	✖	✖	✖	✓

Dr Ryniker pointed out that cyclic vomiting syndrome (recurrent episodes of severe vomiting with symptom-free intervals) and infantile colic (excessive crying in infants without an identifiable cause) are variants of abdominal migraine. She explained that until about 10 years ago it was believed that cyclic vomiting syndrome was only seen in children, but it is now also recognised in adults and often these patients require hospitalisation. She added that sumatriptan is a suitable treatment for both abdominal migraine and cyclic vomiting syndrome, and that the main difference between these two conditions is that gastrointestinal motility is decreased in abdominal migraine but increased in cyclic vomiting syndrome.

Managing abdominal migraine

Dr Ryniker explained that effective management of abdominal migraine requires a combination of supportive measures, acute medications, and preventative strategies tailored to the individual patient. Supportive measures include a quiet, dark room and hydration, while preventative lifestyle adjustments involve regular sleep, meals and hydration. Cognitive-behavioural therapy may be of benefit. Acute medication options include NSAIDs, triptans, and IV fluids for severe nausea/vomiting. Preventive medications include propranolol, amitriptyline, and topiramate.

CASE REPORT:

Dr Ryniker discussed a case of a 25-year-old woman referred to her from primary care. The woman presented with a 6-month history of abdominal pain and vomiting; she experienced episodes lasting 4-6 hours, 1-2 times per week, without symptoms in between. She had a history of cannabinoid hyperemesis syndrome at age 23 and of migraines as a child. Laboratory investigations were normal as was a recent gastroscopy. Following a trial of sumatriptan, her symptoms of abdominal migraine subsided.

Dr Ryniker explained that increasing dietary fibre intake may have a beneficial effect on migraine prevalence and management, although the impact appears to vary across different populations.[7] According to the findings of a study of US adults, for every 10 g/day increase in dietary fibre, the prevalence of severe headaches or migraines decreased by 11%.[7]

Dr Ryniker pointed out that there is a strong connection between migraine in adults and functional gastrointestinal disorders, and that this connection highlights the need for a comprehensive, integrated approach to managing these complex conditions. She explained IBS is frequently reported in patients with migraine, with studies showing a strong genetic correlation between the two conditions, and that functional dyspepsia is reported as the second most common functional gastrointestinal disorder in patients with migraine. Furthermore, cyclic vomiting syndrome is also seen in patients with migraine.

Amitriptyline for IBS

Investigating the use of low-dose amitriptyline, a tricyclic antidepressant with analgesic and neuromodulatory effects, as a second-line agent in the treatment of adults with IBS, the ATLANTIS trial demonstrated that this agent significantly reduced IBS symptoms compared with placebo over a 6-month period.[8] Dr Ryniker explained that amitriptyline influences the brain-gut axis by its effects on serotonin, a key neurotransmitter in this system, and pointed out that the findings of this study are very encouraging and will no doubt have a positive impact on the treatment of IBS in primary care.

TAKE-HOME MESSAGES

- The prevalence of abdominal pain in primary care is approximately 2.4%, with women of all age groups more likely than men to report such symptoms[1]
- Approximately 9% of childhood primary care visits are due to acute abdominal pain[2]
- Taking a thorough history in patients with recurrent abdominal pain is essential
- Once structural causes of abdominal pain have been ruled out, functional abdominal pain disorders (FAPDS) including IBS, functional dyspepsia, abdominal migraine, and functional abdominal pain – not otherwise specified must be investigated
- It is estimated that approximately 9% of children experience migraines and 0.2-4% of the paediatric population is affected by abdominal variants of migraine
- The management of abdominal migraine requires a combination of supportive measures, acute medications, and preventative strategies tailored to the individual patient
- Amitriptyline has shown efficacy in the second-line treatment of IBS.[8]

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QUESTIONS AND ANSWERS

Q. What is the basis of cyclic vomiting?

A. The pathophysiology of cyclic vomiting is related to gut motility and can be influenced by genetic predisposition to migraine. There may be a straightforward event than starts a vicious cycle in terms of brain-gut interaction.

Q. Recently in the ED, treatment for cannabinoid hyperemesis syndrome has involved the use of droperidol. A good response has been seen in such patients with abdominal pain. Could these patients actually have abdominal migraine?

A. Yes, it is all under one umbrella!

Q. Would erythrocyte sedimentation rate (ESR) be a good test to include?

A. We steer away from measuring ESR in patients with gastrointestinal issues because it is an expensive test and the CRP is equally informative with regard to inflammation. Albumin, CRP and faecal calprotectin are the tests of choice.

Q. How does gastroparesis fit into this?

A. Gastroparesis is a completely separate entity.

Q. Are there any studies comparing hyoscine butylbromide [Buscopan®] and amitriptyline for IBS?

A. Amitriptyline works well in all variants of IBS (pain predominant, diarrhoea predominant, and constipation predominant). Studies suggest that amitriptyline is superior to hyoscine butylbromide for IBS.

Q. If the patient can't take amitriptyline for IBS, what else can be used?

A. Amitriptyline should be considered a second-line therapy for IBS when first-line therapies fail to provide symptomatic relief. The recommended first-line therapies include bulking agents such as Konsyl-D, Metamucil, or Enterosgel. When selecting a tricyclic antidepressant, amitriptyline is a suitable option for individuals with diarrhoea-predominant IBS, particularly when there is a concurrent need to aid sleep. In contrast, nortriptyline should be considered for individuals with mixed-type IBS or constipation-predominant IBS. Nortriptyline is preferred in these cases as it has a less pronounced anticholinergic effect, and it is a better choice when the sedative effects of amitriptyline need to be avoided.

Q. Is there a place for probiotics?

A. There is insufficient evidence to show that formulary-based probiotics work in these conditions, but we do know that fibre intake is very important for the microbiome. Avocados are a great source of fibre (approx. 14g in a medium-sized avocado), but they are calorie dense. Ultra-processed foods alter the microbiome. Avoiding ultra-processed foods and eating plenty of vegetables is very important. Kiwifruit can be beneficial not just for its high fibre content, but also digestive enzymes. The recommendation is approx. 35g of fibre per day.

Q. HealthPathways advise to undertake a full blood count and CRP first and leave the faecal calprotectin until later, due to the cost of tests. Should we follow this advice?

A. Follow HealthPathways advice, but for a patient with chronic abdominal pain and chronic diarrhoea for >4 weeks, faecal calprotectin will be undertaken down the track anyway, so undertaking it early for those patients will save time and improve access to endoscopy. This is where taking a good history is important.

Q. Are endometriosis and IBS related?

A. Yes, most likely.

Q. Younger patients are being diagnosed with bowel cancer. How do we catch these patients?

A. Cancer is affecting younger patients and we need to be vigilant in recognising this. Rectal bleeding, weight loss and iron-deficiency anaemia should be investigated – flexible sigmoidoscopy can be useful. There is not enough evidence to support screening.

Q. Does Iberogast® work for IBS?

A. Yes.

Useful resources for patients:

https://www.mindovergut.com

https://zoe.com/learn/category/podcasts

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