

## Review article

## ABDOMINAL MIGRAINE IN A PEDIATRIC PATIENT

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**Abstract**

*Abdominal migraine (AM) is a syndrome usually diagnosed in childhood. The AM syndrome comprises episodic attacks of severe, recurrent, and chronic abdominal pain localized in the periumbilical area, followed by symptoms like headache, anorexia, nausea, vomiting, or pallor. Between the abdominal migraine episodes the child felt good and continued to develop well. The pathophysiological process is presumed to be similar to that of other functional gastrointestinal disorders (FGIDs) and cephalic migraine. It is vital to assess anamnesis, dietary and social history, detailed physical examination, and symptom-based guidelines. Evaluation of the patient for the presence of any potential alarming symptoms or signs, to exclude an organic disease, is essential. The major problem is the lack of knowledge regarding its unclear pathophysiology. Nonpharmacological and pharmacological treatment alternatives vary. Although thorough diagnostic criteria under Rome IV classification of FGIDs and International Classification of Headache Disorders are available, AM persists to be an underdiagnosed entity. A definite diagnosis of abdominal migraine allows appropriate management and avoids unnecessary investigations and incorrect treatments.*

**Keywords:** abdominal migraine; children; abdominal pain; chronic pain

**Introduction**

Experience of chronic and recurrent abdominal pain is the cause of a great morbidity in a pediatric population, deteriorating the child's quality of life. Chronic abdominal pain in childhood is the reason for 2 to 4% of visits to primary care medical doctors and 50% of referrals to gastroenterologists<sup>1</sup>. Accordingly to previous studies, about 10 to 12% of children suffer from abdominal pain, which belongs to functional gastrointestinal disorders (AP-FGIDs). AP-FGIDs in childhood include irritable bowel syndrome (IBS), functional abdominal pain (FAP), abdominal migraine (AM) and functional dyspepsia (FD)<sup>2</sup>.

The most common cause of functional abdominal pain in children is AM. It is incorporated under the Rome IV classification of FGIDs and stated as a type of pediatric migraine and has specific diagnostic criteria under the International Classification of

Headache Disorders (ICHD) III<sup>3,4</sup>. The prevalence of AM in pediatrics ranges from 2.4 to 4.1% of abdominal pain causes. It is commonly diagnosed at 3–10 years old, with the peak incidence at seven, although it has been described in infants and adulthood<sup>1</sup>. Girls are affected more than boys. AM comprises isolated paroxysmal attacks of moderate to severe pain in the middle portion of the belly, around the umbilicus, persisting between one and 72 hours, and accompanied with headache, nausea, vomiting, photophobia and pallor. The pain is recurrent within 12-months. The symptoms are usually relieved by sleep.

Children with recurrent abdominal pain are at risk of social and educational development impairment<sup>5</sup>. Additionally, AM is a significant burden on the community's health care resources<sup>5</sup>. More knowledge by both general pediatricians and pediatric gastroenterologists about the essential characteristics of this idiopathic disorder would improve

diagnostic exactness and help clinicians in choosing an adequate treatment for these children.

### ***Pathophysiology***

In the available literature over the past decades, little progress has been made in understanding pathophysiology of AM. Up today, there are various hypotheses of pathophysiology for the FGIDs as a group<sup>6</sup>. The hypotheses address autonomic nervous system unsteadiness, disturbance in the hypothalamic–pituitary–adrenal axis and modulated motility of the gut wall<sup>6</sup>. The literature demonstrates possible genetic influences and differences in immune and neuronal structures within the bowel mucosa as potential fundamental physiological mechanisms for the disorders. The leading theory in the literature states the role of visceral hypersensitivity to distension in response to abnormalities in neurophysiology at the level of the gut, spinal cord, or higher cortical systems. Collins and Thomas supposed that the interaction among abnormal visceral perception, altered gut motility, and psychological factors lead to an alteration in the „brain-gut” axis linking the enteric nervous system and the central nervous system<sup>7</sup>. There is a lack of understanding of the theory about changes in serotonin and histamine levels. Migraine headache, cyclical vomiting, and abdominal migraine share a mutual etiologic causative agent<sup>8</sup>. AM and migraine headaches share the same associated symptoms, family history, precipitants, demographics, and treatment modalities<sup>8</sup>. Genetic factors may be involved in about 60% of children with an AM with a positive family history for migraine headaches. None of the theories, as mentioned earlier, were investigated concerning abdominal migraine as a specific disease entity.

### ***Triggers of abdominal migraine***

Triggers for abdominal migraine are analogous to triggers for classic migraine headache<sup>9</sup>. These involve chocolate and nitrate-containing foods, stress, and anxiety. Other possible triggers include chemicals in processed meats, swallowing excessive amounts of air, exhaustion, motion sickness, alterations of sleep pattern, exposure to flickering lights, prolonged fasting, travel, and

excitement. Emotional changes might lead to the release of chemicals trigger migraine symptoms.

### ***Diagnoses of abdominal migraine***

Dignan et al. generated a guideline for diagnosis of abdominal migraine, defining the AM exclusion criteria like symptoms not interfering with daily activities, burning pain, non-midline pain, symptoms suggestive for food allergy or other disease, pain lasting less than one hour, or persistence of symptoms between attacks<sup>1</sup>. The traditional approach to recurrent episodes of abdominal pain in children serves to determine an organic or nonorganic cause for the pain<sup>10</sup>.

The International Headache Society included diagnostic criteria for abdominal migraine in the International Classification of Headache Disorders Edition III. Additionally to these criteria, the presence of gastrointestinal or urinary tract disease must be excluded based on history, physical examination, or investigations. Similar approaches exist in the Rome IV Pediatric Criteria for Functional Gastrointestinal Disorders. These two classifications differ in several aspects, namely, the number of episodes required to confirm the diagnosis and the periods of intervening wellness in the Rome IV criteria. A mutual thread between sets of these diagnostic criteria is the absence of organic disease. Therefore, defining the extent of investigation of recurrent abdominal pain becomes a crucial factor in the diagnostic procedure.

Diagnosing AM is difficult, especially during the first episode. The differential diagnosis includes inflammatory conditions, structural abnormalities, metabolic disorders, food intolerances, urinary tract pathology, and other functional gastrointestinal disorders. In the era of pioneering AM research, initial diagnostic tests in children with a suspected AM recommended only urine, blood, and stool analyses for the exclusion of organic etiology for recurrent abdominal pain. Several authors identified red flag signs and symptoms in an attempt to identify children with recurrent abdominal pain in need of further investigation. These are changes in growth patterns, intermittent unexplained fevers, pain radiating to the back, localized tenderness away from the umbilicus, bilious emesis, visible or occult blood in the stool, chronic diarrhea

(> 2 weeks), mouth ulcers, dysphagia, rashes with no identifiable cause, nocturnal symptoms, arthritis, organomegaly, dysuria, anemia, pale mucous membranes, delayed puberty, and family history of inflammatory bowel disease<sup>11</sup>.

### **Treatment options**

Children feel good between AM episodes, but when pain is present it lasts more than an hour and interferes with regular daily activities. Hence, severity, frequency, and morbidity associated with episodes dictate an appropriate treatment method.

Both nonpharmacological and pharmacological treatment alternatives vary. Nonpharmacological methods involve nutrition modification therapy and psychological therapy. A detailed explanation to the parents that severe abdominal pathology is absent and that symptoms will go down with advancing age is all that is needed for treatment in cases of mild abdominal migraine. Of the psychological treatment options available, cognitive behavioral therapy seems to have the most promising outcome<sup>12</sup>. Cognitive-behavioral therapy can be used with the idea of a psychological cause of pain like the need for parental attention and absence from school. Avoidance of suspected causative triggers can reduce the frequency or severity of attacks, although the evidence to support this theory is lacking. Dietary modifications imply increased fiber, reduced lactose, and a „few foods” diet, also lack the proof to support it. The „few foods” diet management requires control by a dietician and is reserved for children with frequent painful episodes (two per week). This diet consists of a minimal number of foods that do not usually evoke symptoms, and the number of ingredients that a child can eat increases by one more component per week.

Indications for the pharmacological therapy include patients with severe and frequent symptoms and for those who are refractory to nonpharmacological treatment. Criteria for selecting children is poorly defined and may be based more on the viewpoint of the parent than on any objective measure of severity. The first line of treatment involves simple analgesics (acetaminophen or ibuprofen) and antiemetics medications (ondansetron). The second line includes triptans, almotriptan,

sumatriptan/naproxen, nasal zolmitriptan, nasal sumatriptan, and injectable sumatriptan. Severe, frequent, and disrupted usual daily routine mandates prophylaxis with cyproheptadine, propranolol, and an H1 antagonist<sup>13</sup>. Valproic acid is a newer agent studied concerning abdominal migraine<sup>14</sup>.

The STRESS mnemonic is the learning guide for providers and a practical handout for parents for prevention: S for stress management, T for travel tips (motion sickness, altitude changes, disrupted sleep patterns and dehydration), R for rest, E for emergency signs requiring medical attention (fever, weight loss, bilious vomiting, pain that wakens the child from sleep and radiation to the back, mouth ulcers, difficulty swallowing), S for sparkling lights, and S for snacks to avoid like caffeine-containing food; aged, overcooked, and processed meats; amine-containing food<sup>15</sup>.

### **Conclusion**

An extensive history data followed by detailed physical examination with the use of well-defined guidelines and appropriate diagnostic tests will aid in the timely diagnosis of AM. A proper method to treat abdominal migraine includes integration of various treatments options, what depends on the severity of symptoms. Further researches are needed into the etiology of AM which will enable use of treatment tailored to the pathophysiology of the condition.

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