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Review

Approach to Recurrent Abdominal Pain in School-Aged Children With No Organic Findings

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Abstract

Recurrent abdominal pain (RAP) in school-aged children without identifiable organic causes remains a complex and common clinical presentation. It significantly affects daily functioning, including school attendance and emotional well-being, despite the absence of structural or biochemical abnormalities. Functional gastrointestinal disorders (FGIDs), as defined by the Rome IV criteria, offer a framework for understanding these cases, emphasizing the interaction between the brain and the gut in symptom development. Visceral hypersensitivity altered pain processing in the central nervous system, and dysregulated autonomic responses are frequently implicated in these children. Psychological comorbidities such as anxiety and somatization are prevalent, often influencing both the perception and reporting of pain. Family dynamics, parenting styles, and environmental stressors also contribute to the persistence and severity of symptoms. Diagnosis requires a careful balance between excluding organic pathology and avoiding excessive investigations. Clinical confidence often depends on the absence of alarm features and the use of structured criteria for functional diagnoses. Management strategies have evolved from pharmacologic treatment to more integrative, evidence-based approaches. Cognitive behavioral therapy (CBT) has demonstrated sustained improvement in both symptoms and school functioning. Dietary modifications, including low-FODMAP regimens, have shown benefits in selected subgroups. Long-term studies indicate that children with unresolved RAP are at increased risk of chronic pain and mental health disorders in adulthood. Early intervention focused on functional recovery, emotional regulation, and environmental support can significantly alter the clinical course. Collaborative care involving pediatricians, mental health professionals, and schools is essential for effective outcomes. A biopsychosocial understanding of RAP supports targeted intervention, reduces unnecessary testing, and promotes resilience in affected children. Recognition of functional abdominal pain as a legitimate and manageable condition is key to improving quality of life and preventing chronic health issues into adolescence and adulthood.

Keywords: *recurrent abdominal pain, functional gastrointestinal disorders, school-aged children, cognitive behavioral therapy, biopsychosocial model*

Introduction

Recurrent abdominal pain (RAP) is a common and distressing complaint among school-aged children, often posing diagnostic and therapeutic challenges for clinicians. Defined traditionally as at least three episodes of abdominal pain severe enough to affect activities over a period of at least three months, RAP affects approximately 10–20% of children globally, with a significant impact on quality of life and school attendance (1). Despite its prevalence, in a substantial proportion of these cases, no identifiable organic cause is found after thorough medical evaluation, leading to a classification under functional gastrointestinal disorders (FGIDs) according to Rome IV criteria.

The etiology of RAP without organic findings is multifactorial and complex, involving an interplay of biological, psychological, and social components. The brain-gut axis, a bidirectional communication system between the central nervous system and the gastrointestinal tract, plays a crucial role in the development of symptoms. Disruptions in this axis, whether due to stress, altered pain perception, or dysregulation of gut motility and microbiota, are commonly implicated in functional abdominal pain syndromes in children (2). Moreover, children with a history of anxiety, depression, or exposure to stressful life events, such as family discord or school bullying, are more susceptible to persistent symptoms. These psychosocial factors not only contribute to the onset but also perpetuate the chronicity of pain, especially when medical reassurance alone is insufficient.

Clinical evaluation of RAP in the absence of organic findings requires a careful and systematic approach. It is essential to differentiate functional pain from alarm features that may suggest an underlying pathology, such as weight loss, gastrointestinal bleeding, or nocturnal symptoms. The Rome IV classification provides a useful framework, categorizing FGIDs into conditions such as functional dyspepsia, irritable bowel syndrome (IBS), abdominal migraine, and functional abdominal pain–not otherwise specified (3). However, overlapping symptoms and evolving presentations often blur the boundaries between these categories, necessitating individualized assessment and longitudinal follow-up.

Management strategies have evolved beyond pharmacological interventions to include cognitive-behavioral therapy (CBT), dietary modifications, and family-based interventions. Studies have shown that a multidisciplinary approach targeting both the child and family environment yields superior outcomes compared to medical therapy alone (4). Parental understanding, school support, and structured coping mechanisms can reduce symptom severity and improve overall functioning. Furthermore, minimizing unnecessary investigations and focusing on functional recovery rather than complete symptom elimination are key components of effective management.

Discussion

RAP in school-aged children without identifiable organic pathology continues to challenge clinicians due to its multifaceted nature. The interplay between physiological, psychological, and social factors underpins the complexity of functional abdominal pain, requiring more than a purely biomedical approach. Recent studies suggest that dysregulation of the gut-brain axis, particularly involving visceral hypersensitivity and altered central pain processing, plays a pivotal role in symptom persistence (5). This insight emphasizes the necessity of recognizing RAP as a functional disorder rather than dismissing it as benign or psychosomatic.

Psychological comorbidities such as anxiety and depression are frequently observed in children with functional RAP, and parental responses to illness behavior have been shown to significantly influence symptom expression and disability (6, 7). This reinforces the value of family-centered interventions and the importance of early psychological assessment. While medical reassurance is essential, it is insufficient as a stand-alone approach. Combining education with behavioral therapies, such as CBT, has demonstrated meaningful reductions in symptom frequency and school absenteeism. Clinicians must balance the need to exclude serious conditions with

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the imperative to avoid unnecessary investigations, ensuring that care is guided by functional recovery and patient well-being rather than diagnostic certainty.

Biopsychosocial Perspectives in Recurrent Abdominal Pain

RAP in school-aged children with no identifiable organic cause represents a classic example of how biological, psychological, and social domains intersect pediatric health. This model moves beyond traditional diagnostics and incorporates a layered understanding of how different systems influence the expression and persistence of symptoms.

On the biological level, children with functional RAP often demonstrate altered pain processing pathways. These children frequently exhibit visceral hypersensitivity, where normal physiological signals from the gastrointestinal tract are perceived as painful. Neuroimaging studies using diffusion tensor imaging have shown microstructural abnormalities in the brain's pain-processing regions, including the anterior cingulate cortex and insular cortex. These abnormalities appear to correlate with the severity of reported symptoms and may serve as biological markers of altered gut-brain signaling in functional disorders (7). This suggests that some children may be biologically predisposed to amplify gastrointestinal sensations, especially in the context of chronic stress or early adverse experiences.

Psychological factors, particularly anxiety and internalizing behaviors, are consistently associated with RAP. Children who experience frequent worry, sadness, or difficulty coping with stress often report more intense and more frequent abdominal pain. One large study found that nearly 70% of children presenting with recurrent abdominal pain also met criteria for an anxiety disorder or depressive symptoms, even when such diagnoses had not previously been established (5). Psychological distress can influence autonomic nervous system function, leading to increased gut motility, mucosal sensitivity, and dysregulated responses to minor discomfort. These interactions between emotional state and physical sensation illustrate the need for early psychological evaluation in pediatric patients presenting with chronic abdominal symptoms.

Social influences, particularly those within the family, can significantly shape the expression and trajectory of functional abdominal pain. Parenting styles and family responses to illness behaviors often affect how children interpret and express their symptoms. In some cases, children who receive heightened attention or are excused from responsibilities when they experience pain may be unintentionally encouraged to maintain the sick role. A well-known study demonstrated that children whose parents exhibited higher levels of health anxiety or catastrophic thinking were more likely to report chronic and disabling abdominal pain over time (8). The intergenerational transmission of health-related behaviors, attitudes, and expectations cannot be overlooked in assessing and managing RAP.

Outside the home, school environments also contribute to the experience of RAP. Academic demands, teacher-student dynamics, and peer relationships are common sources of stress that may manifest as physical symptoms in children who lack other outlets for expression. In these cases, absenteeism and disengagement are often seen before a clear diagnosis is made. School-based interventions have shown promising outcomes. One pilot study using guided imagery techniques delivered through school nurses found significant reductions in abdominal pain severity and school absenteeism among children diagnosed with functional gastrointestinal disorders (9). Incorporating school personnel into the care team may provide continuity and reinforce coping strategies in real-world settings.

Diagnostic Challenges and the Role of Functional Gastrointestinal Disorders

Evaluating RAP in school-aged children without clear organic pathology often places clinicians at a difficult intersection of exclusion and interpretation. While it is essential to rule out life-threatening or progressive conditions, many children continue to report persistent symptoms even after extensive medical workups yield no definitive findings. This

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scenario frequently results in diagnostic fatigue, both for healthcare providers and families, with the added risk of unnecessary investigations, fragmented care, and growing frustration.

The current diagnostic framework for FGIDs offers a clinically useful structure, but the nuances of applying these criteria in pediatric populations are considerable. The Rome IV criteria classify FGIDs such as functional dyspepsia, IBS, abdominal migraine, and functional abdominal pain not otherwise specified. These diagnoses are based on symptom patterns rather than laboratory or imaging abnormalities, which can challenge both physicians and parents who may expect concrete evidence of disease. A study evaluating the use of Rome criteria in primary care found that clinicians often underutilized or misapplied them, particularly in younger children, due to uncertainty in interpreting non-specific symptom descriptions and developmental differences in communication (10). This diagnostic ambiguity contributes to variability in management and can delay appropriate intervention.

Adding to the complexity, the symptoms of FGIDs often overlap with those of organic diseases, particularly in the early stages. Abdominal pain associated with changes in bowel habits, postprandial discomfort, or episodic nausea may mimic conditions such as inflammatory bowel disease, celiac disease, or peptic ulcer. Yet, repeated testing often fails to identify any structural or biochemical abnormality. This overlap demands careful clinical judgment. In practice, experienced clinicians rely on the absence of alarm features such as gastrointestinal bleeding, significant weight loss, nocturnal symptoms, and growth failure to guide their confidence in diagnosing FGIDs. However, a lack of standardized protocols across institutions can lead to over-investigation in some settings and premature reassurance in others.

The diagnostic process is further shaped by cultural, emotional, and systemic influences. Children from different backgrounds may describe symptoms differently, and in many cases, abdominal pain becomes a proxy for unspoken distress. Pediatricians must listen beyond the surface complaints, assessing psychosocial contexts without prematurely attributing the problem to stress or behavioral issues. A study involving children with undiagnosed abdominal pain found that nearly half had experienced traumatic events or ongoing family conflict that had not been previously disclosed in clinical encounters (11). These findings support a more integrative diagnostic approach, involving mental health screening and family-based interviews early in the evaluation process.

System-level factors, such as fragmented care and limited access to pediatric gastroenterology specialists, also hinder timely diagnosis. Delays often occur when children cycle between emergency departments, school nurses, and general practitioners, each visit addressing symptoms in isolation. In a retrospective review, it was shown that children with RAP had significantly more healthcare visits and school absences before receiving a functional diagnosis compared to children with organic conditions (12). The lack of coordinated care pathways contributes to prolonged uncertainty. Additionally, a physician's discomfort with labeling a child with a "functional" diagnosis without clear treatment options may lead to avoidance or excessive reassurance. Qualitative studies with pediatricians have revealed that while most agree with the biopsychosocial model in theory, few feel confident applying it consistently in a busy clinical setting (13). This mismatch between conceptual understanding and applied practice underscores the need for diagnostic frameworks that are not only evidence-based but also practical in everyday clinical care.

Evidence-Based Management Strategies and Long-Term Outcomes

The management of RAP in school-aged children without organic findings relies on strategies grounded in both clinical experience and controlled research. Treatment must not only reduce the severity and frequency of symptoms but also restore function and prevent long-term complications. The emphasis has gradually shifted from a disease-focused model to a child-centered framework that

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supports resilience, adaptive coping, and structured behavioral change.

Pharmacologic treatments have a limited but carefully defined role. While medications such as antispasmodics and antidepressants are sometimes used off-label in pediatric populations, their benefits appear modest when compared to behavioral interventions. A double-blind trial assessing the efficacy of cyproheptadine in children with functional abdominal pain reported a reduction in pain intensity and frequency, especially in younger patients and those with early satiety or dyspepsia-related symptoms (14). Although promising, these results also highlighted the variability in treatment response, suggesting that pharmacologic therapy is best reserved for targeted symptoms rather than as a first-line intervention for all children.

CBT remains one of the most studied and effective interventions for RAP in pediatric populations. Unlike reassurance or education alone, CBT aims to reframe maladaptive thoughts related to pain, reduce avoidance behaviors, and build coping strategies. A randomized controlled trial showed that children who received CBT demonstrated significantly fewer pain episodes and improved school attendance compared to controls, with benefits sustained at 12-month follow-up (15). Importantly, parental involvement in therapy amplifies these effects. When parents learn to reinforce wellness behaviors and reduce attention to somatic complaints, children's recovery is more durable. This dual focus on the child and family system reflects the biopsychosocial roots of the condition and supports more sustainable outcomes.

Dietary interventions have gained traction as adjuncts to therapy. While there is limited evidence to support universal dietary restrictions, targeted changes based on individual symptom patterns can be helpful. For instance, a trial investigating the low-FODMAP diet in children with irritable bowel-type symptoms found a reduction in bloating and abdominal discomfort in a subset of participants (16). However, strict dietary regimens can be difficult to maintain and may inadvertently reinforce symptom-focused behaviors. Therefore, collaboration with pediatric dietitians is often essential to balance nutritional adequacy with therapeutic goals. Identifying food triggers should be individualized rather than prescriptive.

Long-term outcomes in children with RAP are shaped not only by symptom resolution but also by psychosocial adaptation. Follow-up studies tracking adolescents into adulthood have shown that children with untreated or poorly managed RAP are at higher risk for chronic pain syndromes, anxiety disorders, and functional disability. A longitudinal cohort study found that over 30 percent of children with RAP reported persistent abdominal pain into early adulthood, with many also experiencing academic underachievement and social withdrawal (11). These findings underscore the need for early intervention that prioritizes both symptom control and psychosocial development. Interdisciplinary collaboration, continuity of care, and school-based support systems contribute significantly to long-term recovery, reducing the likelihood of functional persistence into later life.

Conclusion

Recurrent abdominal pain in school-aged children without organic findings requires a comprehensive and individualized approach. The integration of biological, psychological, and social perspectives is essential for accurate diagnosis and effective management. Evidence-based interventions such as cognitive behavioral therapy and targeted dietary changes improve both symptoms and function. Early identification and consistent care can reduce the risk of chronic symptoms and long-term psychosocial consequences.

Disclosure

Conflict of interest

There is no conflict of interest.

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Ethical consideration

Non applicable.

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Data availability

Data that support the findings of this study are embedded within the manuscript.

Author contribution

All authors contributed to conceptualizing, data drafting, collection and final writing of the manuscript.

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