Feeding problems in infancy and early childhood are very common. Twenty-five percent to 45% of typically developing children reportedly experience some type of feeding problem. Although many of these issues are temporary, with no significant clinical impact, psychologically traumatic events can result in acute food refusal with serious risk of harm, either necessitating or occurring during an inpatient hospitalization. Emerging literature and diagnostic entities are focusing on the ways psychological stress can precipitate avoidant and restrictive food intake. Recent changes in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), have brought renewed attention to psychological trauma in young children that results in disordered eating. In the present article, we examine iatrogenic food refusal in the context of medical traumatic stress of a 5-year-old girl to demonstrate diagnostic consideration and treatment strategies.

CASE REPORT

K.G. was a 5-year-old otherwise healthy girl without restrictive or picky eating before presentation who was transferred from a referring hospital pediatric ward at day 13 of her hospitalization for evaluation and treatment of acute-onset abdominal pain and total by mouth (PO) refusal. The patient was in her usual state of health until she presented to the referring hospital with a 3-day history of vague abdominal pain, nausea, nonbloody nonbilious emesis, and 1 episode of nonbloody diarrhea. One sick contact with viral illness was reported before admission.

A full review of systems was otherwise negative.

The patient’s referring hospital physical examination was notable for a relatively well-appearing, somewhat anxious but talkative young girl with mild diffuse abdominal tenderness most evident at the umbilicus and “feeling like a bubble,” with mild hepatomegaly variably reported by clinical examiners. Transaminitis was noted, with alanine transaminase levels of 139 IU/L and aspartate transaminase levels of 123 IU/L. Results of multiple laboratory studies obtained at the referring hospital reported as normal included serum tissue transglutaminase, immunoglobulin A, ceruloplasmin, 24-hour urine copper level, viral hepatitis panel, urine vanillylmandelic acid and homovanillic acid, α1-antitrypsin, ammonia, lipid panel, thyroid panel, cosyntropin and cortisol testing, amylase, and lipase. A respiratory panel was positive for influenza B and negative for Epstein-Barr virus, cytomegalovirus, adenovirus, and enterovirus.

Diagnostic studies at the referring hospital included esophagogastroduodenoscopy, revealing nonsevere esophagitis without bleeding, mildly erythematous mucosa in the gastric body, and a normal duodenum; biopsy...
results from the esophagus, gastric body, and duodenum were within normal limits with no evidence of eosinophilic esophagitis. A Doppler ultrasound revealed mild hepatomegaly and steatosis with no portal hypertension; a computerized tomography scan of the abdomen showed fatty changes in the liver; and liver biopsy results revealed macrovascular steatosis without fibrosis and normal bile ducts. An MRI of the brain as well as electromyography/conduction studies showed no abnormalities. It was unclear to the receiving treatment team why such an extensive evaluation had been performed at the referring hospital other than reports that the original treatment team believed the patient was becoming noncommunicative, and they took that as evidence of potential worsening physical disease.

The patient’s treatment at the referring hospital included pantoprazole, Carafate, ondansetron, dronabinol, and morphine, with brief trials of erythromycin and oseitamivir. Due to continued inability to tolerate P0 intake during much of this evaluation, the patient received nasogastric tube (NGT) feedings for approximately the first 2 days of admission. The pediatric team at the referring hospital noted further avoidance of solids and liquids as testing progressed. Psychiatric consultation comprised a single brief visit and resulted in a diagnosis of unspecified eating disorder, recognition of worsening fear of medical tests, and a recommendation for sedation during any further tests. A peripherally inserted central catheter line was placed, and total parenteral nutrition (TPN) was initiated during the additional studies on hospital day 4. Transfer to our pediatric tertiary care center was arranged after 13 days due to inability to reinstitute feeding and for further medical evaluation.

Upon admission to our center, the primary psychiatric consult service with concern regarding anxiety symptoms resulting in oral aversion and for help transitioning the patient from TPN back to NGT feeding and eventually oral feeding. The parents expressed concern for their child’s drastic personality change as well as their fears of an undiscovered medical condition causing her inability to eat. The working medical diagnosis was viral gastroenteritis and possible gastroparesis.

**NONORGANIC FACTORS CONTRIBUTE TO ACUTE FEEDING BEHAVIOR CHANGES IN CHILDREN**

Studies have suggested that 16% to 30% of feeding disorders are labeled as organic; however, up to 80% of patients who were referred for complex feeding disorders had behavioral findings and were referred to specialists for behavioral treatment. Although medical conditions may initially trigger changes and impairment in feeding behavior, the behavior change often persists due to conditioned responses or other psychological and behavioral factors that interact with the underlying physiology. It is also important to note the influence of environmental and parental factors, as the disorder should be conceptualized in a biopsychosocial context. Inpatient management of feeding disorders may suffer from a limited awareness of the associated complex biopsychosocial issues and from a lack of psychosocial resources (personnel) that should be an integral part of the treatment plan. The frequency and intensity of fearful experiences regarding eating and drinking most influence acute feeding behavior changes in children. Distress about a child’s feeding behavior by the parents, particularly in children with medical illnesses or developmental problems, can further disrupt feeding behavior by parents’ vigorous attempts to make the child eat or prevent feeding. In children with existing anxious temperament or anxiety disorders, there is a tremendously higher risk of developing food refusal. Given the complex interplay between medical and behavioral components, feeding disorders should be understood as multifactorial, with significant psychological components such as child temperament, physiologic conditions, structural anomalies, developmental problems, environmental supports and limitations, parental stress, and parenting style. Practitioners and families have sometimes struggled to understand this complex array of contributing factors, leading to an imprecise diagnosis and therapeutic strategy. A new diagnostic entity in the DSM-5, avoidant/restrictive food intake disorder (ARFID), captures those eating disturbances manifested by consistent failure to meet appropriate nutritional needs secondary to anxiety and fear with the distinct absence of body image concerns. ARFID can help guide research and clinical care in many previously unclearly formulated eating and feeding disorder cases, including in patients with persistent anxious avoidance of feeding due to traumatic hospital events.

**Our 5-Year-Old Patient Exhibited Evidence of Traumatic Stress and Feeding Impairment and Required a Multidisciplinary Treatment Approach**

At the time of evaluation by our tertiary hospital psychiatry team, examination of K.G. revealed a girl appearing of stated age, disheveled, lying very still in bed with mild psychomotor retardation, avoiding eye contact, and refusing to speak to providers. She did not follow instructions and was refusing to eat by mouth and to bathe or walk.

The girl’s parents reported that she had become more withdrawn and increasingly oppositional over the course of her treatment. They felt she was particularly scared and confused at the referring hospital when she awoke from anesthesia for NGT placement, as she was not told of its presence and from a lack of psychosocial resources (personnel) that should be an integral part of the treatment plan. The frequency and intensity of fearful experiences regarding eating and drinking most influence acute feeding behavior changes in children. Distress about a child’s feeding behavior by the parents, particularly in children with medical illnesses or developmental problems, can further disrupt feeding behavior by parents’ vigorous attempts to make the child eat or prevent feeding. In children with existing anxious temperament or anxiety disorders, there is a tremendously higher risk of developing food refusal. Given the complex interplay between medical and behavioral components, feeding disorders should be understood as multifactorial, with significant psychological components such as child temperament, physiologic conditions, structural anomalies, developmental problems, environmental supports and limitations, parental stress, and parenting style. Practitioners and families have sometimes struggled to understand this complex array of contributing factors, leading to an imprecise diagnosis and therapeutic strategy. A new diagnostic entity in the DSM-5, avoidant/restrictive food intake disorder (ARFID), captures those eating disturbances manifested by consistent failure to meet appropriate nutritional needs secondary to anxiety and fear with the distinct absence of body image concerns. ARFID can help guide research and clinical care in many previously unclearly formulated eating and feeding disorder cases, including in patients with persistent anxious avoidance of feeding due to traumatic hospital events.

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CLINICAL PICTURE FOR IATROGENIC ACUTE FOOD REFUSAL DUE TO MEDICALLY TRAUMATIC STRESS

Feeding disorders in children who are exposed to medically traumatic stress can be complex and varied. Twenty-five percent to 30% of medically ill children develop posttraumatic stress symptoms (PTSS) upon exposure to traumatic situations in medical settings, and parents of these children are at higher risk of developing PTSS as well.6

Treatment-related trauma in children can be caused by frightening experiences such as painful and distressing procedures, coping with unfamiliar and complex medical settings and language, separation from parents, difficult or unclear diagnosis, and taking coping cues from highly anxious and overwhelmed parents. Parents and children might blame themselves; children might be angry at providers for hurting them and at parents for “not being able to protect them.”9

Children experiencing trauma reactions might have re-experiencing symptoms (rigid, repetitive, anxious reenactment of trauma-related themes during play and nightmares), avoidance (avoiding people, places, situations that remind them of trauma), emotional numbing (withdrawal from family members or play), and hyperarousal (disturbed sleep, increased irritability, fussiness, temper tantrums, hypervigilance, exaggerated startle response, and increased activity levels).6

Preschool-aged children often do not exhibit clear PTSS and are at high risk for underrecognition or misdiagnosis.7 In medically traumatized preschool-aged children, increased separation anxiety, behavioral regression, new feeding or toileting problems, passivity and withdrawal, and hypervigilance with easy startle reflexes might be observed.6 Younger, more severely ill children, and/or those exposed to more invasive procedures with increased length of stay have more medical fears, lower sense of control, and are at high risk for developing trauma symptoms after hospital discharge.8

These symptoms of withdrawal, regression, and changes in eating patterns overlap with ARFID. This scenario supports hospital-associated stress as an etiology for feeding disorders in hospitalized children (Table 1).

PREVENTION AND TREATMENT OF ACUTE FEEDING CHANGES SECONDARY TO MEDICAL TRAUMATIC STRESS

Treatment informs prevention, as the most effective treatments when implemented broadly and prophylactically can reduce the frequency and intensity of medical traumatic stress and subsequent feeding disorders.

The approach to feeding disorders of childhood and ARFID involves eliciting a history of feeding behavior and environmental challenges, assessment of caregivers, and coincidental medical and psychological evaluation of the child. Multidisciplinary treatment teams should include gastroenterologists, nutritionists, behavioral psychologists and psychiatrists, child life specialists, social work, and occupational and speech therapists.3

Integrated medical teams reduce medical costs and length of stay, and improve parent satisfaction.8,9 Hospital settings are often perceived as strange and anxiety-provoking for children and their families. Psychosocial clinicians are experts in individual and systems interventions to reduce the distress of hospitalization.

For children who have medical PTSS, pain and invasive procedures can impair normal eating habits and lead to avoidant eating patterns or worsen them. Behavioral treatment requires focusing on increasing appropriate feeding behavior along with decreasing maladaptive patterns.11–13

Clustering, delaying, or eliminating invasive

<table>
<thead>
<tr>
<th>TABLE 1</th>
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<tr>
<td><strong>Risk factors</strong></td>
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<tr>
<td>• Fearful experiences around eating and drinking</td>
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<tr>
<td>• High parental distress about child’s feeding behavior</td>
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<tr>
<td>• Personal and family history of anxiety and/or feeding issues</td>
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<tr>
<td>• Medically traumatic stress: distressing procedures, coping with unfamiliar and complex medical settings and language, separation from parents, difficult or unclear diagnosis, and taking coping cues from highly anxious and overwhelmed parents</td>
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<tr>
<td><strong>Prevention</strong></td>
</tr>
<tr>
<td>Multidisciplinary treatment approach (eg, psychiatry, psychology, child life, social work)</td>
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<tr>
<td>• Minimize invasive procedures</td>
</tr>
<tr>
<td>• If invasive procedures necessary: explaining procedures to the child in simple language, utilizing medical play, avoiding unreliable promises</td>
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<tr>
<td>• Maximize pain management</td>
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<tr>
<td>• Coping strategies: distraction and relaxation, asking about fears and worries, providing anticipatory guidance, engaging children in age-appropriate treatment decisions</td>
</tr>
<tr>
<td>• Normalize child’s environment: create a daily schedule, familiarize the setting (eg, bringing favorite toys/items from home)</td>
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<tr>
<td>• Assessment and interventions for parents’ anxieties</td>
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<tr>
<td>• Maintain a neutral affect in during procedures and medical interactions</td>
</tr>
<tr>
<td><strong>Treatment pearls</strong></td>
</tr>
<tr>
<td>• Establish an environment of consistency and familiarity</td>
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<tr>
<td>• Reduce medicalization, with the goal of normalizing children’s PO intake</td>
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<tr>
<td>• Meet nutritional needs with reduction of further harm</td>
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<tr>
<td>• Stabilize the patient and the family: supporting parents, medical reassurance</td>
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<tr>
<td>• Psychotropic medications as necessary</td>
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<tr>
<td>• Implementation of a consistent, firm behavioral plan: offering gradually increased PO options (time limited, offering choices, not offering food outside the trial periods, limiting fun activities between trials, incentivizing adherence) and parental coaching (word choices, neutral affect, exaggerated positive responses and reinforcement after successful PO intake)</td>
</tr>
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procedures can help place the focus on eating and promotion of appropriate routines. If invasive procedures are required, involving child life and child psychology/psychiatry with a goal of explaining procedures to the child in simple language, avoiding medical terms, and utilizing medical play are important in the preschool-aged population. Medical play can help achieve a further sense of control and mastery around medical procedures and conditions.4,8

Because poorly controlled pain is an independent risk factor for psychologically traumatizing children, appropriate pain management is crucial in preventing and treating medical PTSS, even in the absence of invasive procedures.6 Pain and anxiety are often more difficult to separate in clear clinical measurements in preschool-aged children; thus, interventions to help with coping strategies such as distraction and relaxation, asking about fears and worries, providing anticipatory guidance, and engaging children in possible treatment decisions are some of the many interventions that can reduce pain, anxiety, and ultimately medical PTSS.4,8

Situational anxiety containment is another important aim for preventing and treating medical PTSS and ARFID. It can be achieved by normalizing a child’s environment to age-appropriate settings. Minimizing separation from parents and familiarizing the setting for the child (eg, bringing favorite toys/ items from home) are simple and effective interventions. Calm, consistent rooms and treatment areas with predictable routines facilitate the best environment for young children and their families.4 Assessment and interventions for parents’ anxieties and trauma symptoms are treatments for children too, as parents’ worries and fears often influence their children’s behavior. Because children often take their cues from their parents, maintaining a neutral affect during procedures and around medical interventions is one of the most helpful interventions for parents of anxious or traumatized children. Family-centered rounds are ideal in helping parents because these rounds improve relationships with the treatment team, create better perceived care, increase family and team communication, and lower rates of familial distress.14

Psychotropic medications can play a role in the treatment of pediatric feeding disorders associated with hospitalization and medical PTSS. Low-dose benzodiazepines have reported efficacy in treating situational anxiety, and the use of selective serotonin reuptake inhibitors in anxious or traumatized preschool-aged children is supported in the literature when symptoms are severe.6,15 α2-Agonists can be used to decrease sympathetic tone and hyperarousal symptoms.6 Antipsychotic medications such as olanzapine have shown some promising results in small studies of eating disorders with severe rigidity or PTSS symptoms, such as anorexia nervosa.16 Although expert guidelines exist for ARFID consistent with the feasibility of these agents, it is widely recognized that this new entity requires more specific evidence-based studies to guide treatment, as its prevalence was up to 4% in 1 large pediatric gastroenterology sample.17,18

**TREATMENT PLAN IN PRACTICE**

At the time of K.G.’s admission, a multidisciplinary team was assembled that included gastroenterology, nutrition, rheumatology, child life, and the psychiatry consult service. Team meetings were held to formulate the case and clarify the treatment approach. The team reviewed the evaluation and concluded that K.G. had viral gastroenteritis/gastroparesis and mild laboratory abnormalities due to the extended absence of oral intake. It was believed that the prolonged absence of food intake was iatrogenic and secondary to the psychological traumatization from overuse of multiple invasive, painful procedures in an inadequate support environment causing significant family and patient distress. Our treatment approach was to establish a familiar and consistent environment, reduce medicalization with the goal of normalizing the child’s P0 intake, and “undo” the medical traumatic stress while ensuring that her nutritional needs were met without causing her more harm. TPN was discontinued immediately, and an NGT was placed after the patient failed 2 initial P0 challenges. NGT placement was essential for re-priming her stomach for food and to deliver feedings overnight to allow for hunger during the day.

Our first step was to establish a supportive, consistent, and familiar environment, thereby stabilizing the patient and her family. The parents were supported by staff with breaks in caretaking and facilitating the patient’s needs to recover from their own fears and trauma in the first few days; they were then able to participate in the behavioral plan for K.G. aimed at normalizing her feeding. The patient responded well to the elimination of further medical procedures and institution of a therapeutic and supportive environment by displaying an improved sense of predictability, familiarity, and control/self-agency. The parents identified medical play with child life, establishing a daily schedule and age-appropriate involvement in nutrition decisions as helpful in their child’s recovery. The parents noted that repeated reassurance by K.G.’s team that her eating and affective changes were not due to a severe, rare medical disorder was extremely helpful in relieving her anxiety. The parents welcomed the diagnosis of a feeding disorder secondary to medical traumatic stress (ie, ARFID), with primary treatment being both nutritional and psychiatric. ARFID was a concrete diagnosis with a focused therapeutic plan and was more manageable than their fantasized fears.

Medications were initiated to address the patient’s PTSS: low-dose citalopram (titrated up to 6 mg) and olanzapine (2.5 mg nightly). These were well tolerated, with no side effects. The occasional low dose of 0.125 mg to 0.25 mg of lorazepam around P0 challenges was well tolerated but deemed ineffective and stopped. This first step of stabilization took ~2 weeks in total with continued P0 refusal. Because of her age, level of emotional withdrawal, and lack of P0 intake, the patient was not eligible for psychiatric or medical rehabilitation placement and was treated on the medical floor.
The second step was reduced medicalization of her hospitalization and implementation of a consistent, strict behavioral plan directed at normalizing her PO intake. The plan was collaborative with parents and the support of the psychiatry team once parents and the patient were more psychologically stable to engage in a strict behavioral plan, offering gradually increased PO options. The behavioral plan included a time-limited offering of PO choices (eg, 10 minutes), providing 2 options to give the child a sense of control (eg, 2 flavors of drink), not offering food outside the trial period to increase expectation to eat when offered, limiting fun activities with parents between trials to shape the behavior toward PO acceptance, and specific parental coaching regarding word choices and neutral affect. When the child took the PO offering, exaggerated positive responses were advised for positive reinforcement.

On day 1 of this part of the plan, K.G. completed the first PO challenge at her second opportunity in 4 hours. When parents reminded her that as soon as she finished her drink they could do something else, KG started consuming the drinks at a much faster pace. Trials were increased from once per day to 3 per day while gradually increasing the amount of PO nutritional drink/water. Within 10 days of this plan, K.G. was successfully taking 3 offers a day. The NGT was discontinued, she began walking more on her own, and she was discharged from the hospital. Over this 3-week period, the patient's mental status gradually improved as she appeared more calm and comfortable, engaged more with providers, and demonstrated a bright affect.

Our psychiatry team followed up with the patient's mother 1 month after discharge. The mother reported continued remission of K.G.'s PTSS and feeding disorder. She reported that K.G. started walking independently within 1 week after discharge, was eating full meals within 1 month, and was able to discontinue her psychotropic medications after 3 months. K.G.'s mother stated that she believed that patient and family anxieties were projected onto providers, leading to multiple unnecessary invasive procedures, as she said “anxiety took over everything.”

**SUMMARY**

Medical hospitalizations and procedures are not without harm. Pediatricians must consider not only the potential physical side effects and complications of hospitalization but also the disruptions in development and psychological functioning, particularly for young children and children with neurodevelopmental delays. Developmentally sensitive appropriate support and anticipatory guidance must be provided before performing a medical evaluation. Our patient had likely viral gastroparesis with multiple unnecessary tests performed that caused more harm than the original diagnosis, resulting in PTSS and a feeding disorder, as well as a prolonged hospitalization. Discussion of death and other adverse events in K.G.'s presence during informed consent, placement of an NGT without appropriate anticipatory guidance, and premature implementation of TPN clearly contributed to an emerging feeding disorder and iatrogenic trauma symptoms (PTSS) for this patient. Successful treatment on the medical wards was achieved with a multidisciplinary team. Inpatient psychiatry and nutritional rehabilitation was not feasible due to the patient's age. Our treatment plan included provision of a safe environment, implementation of a strict behavioral plan to reintroduce oral intake, and the directed use of psychopharmacological agents. This strategy improved our patient's PTSS and her feeding disorder.

We had access to a broad range of multidisciplinary team members who may not be available in many other inpatient settings. Increasing awareness of the importance of psychologically trained staff in optimizing medical treatments, advocating for less testing in anxious or traumatized patients, reducing hospital length of stay, and improving staff and patient satisfaction necessitates greater availability and employment of these staff in the inpatient pediatric settings.


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