Functional Gastrointestinal Disorders in Children

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**Functional disorder** is the term used in disorders which are unable to demonstrate any structural or biochemical abnormality causing them. Functional gastrointestinal disorders are defined as conditions in which variable combination of chronic or recurrent gastrointestinal symptoms are present in the absence of demonstrable disease. This dysfunction results from the interaction of biosychosocial factors at several levels, including visceral hypersensitivity, abnormal motility, and disturbances at the level of CNS. The symptoms may be largely caused by disordered gastrointestinal dysmotility which are produced by organic disease involving enteric nerves and muscles, alteration of humeral environment of the nerves and muscles of the gut and altered central nervous system input.

In 1999 pediatric GI motility committee established functional pediatric GI disorders (FGIDs) in pediatric ROME criteria II.2

**G. Functional pediatric disorders**

G1. Vomiting
   G1a. Infant regurgitation
   G1b. Infant rumination syndrome
   G1c. Cyclic vomiting syndrome

G2. Abdominal pain
   G2a. Functional dyspepsia
   G2b. Irritable bowel syndrome
   G2c. Functional abdominal pain
   G2d. Abdominal migraine
   G2e. Aerophagia

G3. Functional diarrhea
G4. Disorder of defecation
   G4a. Infantile dyschezia
   G4b. Functional constipation
   G4c. Functional fecal retention
   G4d. Non-retentive fecal soiling

ROME criteria II have been evaluated and found that they covered the majority of functional pediatric GI disorders, except in some patients. In 2004, the pediatric working team has established ROME criteria III, but its complete publication is not available.

**G1. Vomiting**

Functional disorders cause recurrent vomiting including infant regurgitation or gastroesophageal reflux, rumination and cyclic vomiting.

**G1a. Infant regurgitation or gastroesophageal reflux**

Regurgitation is the involuntary return of previously swallowed food or secretions into or out of the mouth. It occurs commonly in infants during the first 18 months to 2 years of life. When it causes complications such as esophagitis, failure to thrive, and respiratory symptoms, it is called gastroesophageal reflux disease (GERD). The episodes of reflux are usually due to transient relaxation of lower esophageal sphincter. The diagnostic approach to the infant or child with possible GERD varies depending on the symptom presentations. Infants with GER without any complication do not require diagnostic evaluation. Infants with symptoms of esophagitis such as hematemesis, irritability, iron deficiency anemia may need upper endoscopy or empiric therapy for diagnosis. In cases of respiratory symptoms such as apnea, chronic sinusitis, stridor, recurrent pneumonia, and reactive airway or asthma, esophageal pH monitoring has a role to demonstrate the association between the symptoms and GER; however, a negative test cannot exclude it. Other techniques such as bron-choalveolar lavage and scintigraphy lack adequate specificity for definitive diagnosis.

The treatment goals are to provide effective reassurance and symptom relief. Symptoms improve with positioning after meals, thickening of formula and small feeding volume. Pro-kinetic drugs improve esophageal and stomach motility and increase lower esophageal sphincter are proposed for treatment. Cisapride is more effective in cases with regurgitation. However, because of its cardiac side effects, it has limited use. Erythromycin and baeclofen are other pro-kinetic drugs which their efficacy are not concluded. H2 blocker and proton pump inhibitors are usually used in suspected cases of esophagitis. In Thailand, GERD is commonly found in severe handicapped children and always needs fundoplication and gastrostomy treatment.

**G1b. Infant rumination syndrome**

It is a rare disorder characterized by voluntary, habitual regurgitation of stomach contents into the mouth.
for self stimulation. The onset is between 3 and 8 months of age. The infant may not retain enough nutrients and may develop malnutrition. Rumination, however, is not commonly found in Thai infants and children.

G1c. Cyclic vomiting syndrome

Cyclic vomiting syndrome consists of recurrent, stereotypical episodes of intense nausea and vomiting lasting hours to days which are separated by symptom free intervals. There is no metabolic, gastrointestinal or central nervous system structural or biochemical involvement. Typically, it occurs in a child aged 2-7 years. These children often complain of migraines, motion sickness and other functional bowel disorders. Prophylactic treatments with drugs used in migraine prophylaxis such as amitriptyline, propanolol, cyproheptadine and phenobarbital are recommended in children who have frequent and severe episodes. During severe vomiting episodes, intravenous dextrose fluid, antiemetic (metoclopramide, ondansetron) and sedative drugs may be helpful to interrupt the crisis. In Thailand, this disease is not well known, so mismanagements always occur.

G2. Abdominal pain

Functional abdominal pain is often associated with visceral hyperalgesia, a reduced threshold for pain related to biochemical changes in the afferent neurons of the enteric and central nervous system. Abdominal pain is at least 12 weeks, which need not be consecutive, within the preceding 12 months.

G2a. Functional dyspepsia

Pain locates at the upper abdomen without organic disease. In ulcer-like dyspepsia, pain in the upper abdomen is the predominant symptom. Dysmotility-like dyspepsia has a predominant unpleasant or troublesome non-painful sensation in the upper abdomen. Medication and food known to aggravate symptoms should be discontinued. Histamine receptor antagonist, proton pump inhibitor, sucralfate and low dose tricyclic antidepressants have been used. Prokinetic drug may be helpful for feeling of fullness.

G2b. Irritable bowel syndrome

Abdominal discomfort or pain has two out of three features: relieved with defecation; onset associated with a change in frequency of stool; and onset associated with a change in form of stool. The treatment goals are to provide effective reassurance and symptom relief. Drug therapy plays an adjunctive role in the treatment. Low dose of tricyclic antidepressant has been used for pain. Anticholinergic medication have used for antispasmodic properties. In those with constipation, increased dietary fiber, milk of magnesia or mineral oil may be helpful.

G2c. Functional abdominal pain

Pain is continuous or nearly continuous in school-aged child or adolescent without relation to pain with physiological event. The pain is usually periumbilical. Some patients are perfectionists, whereas others often have unrecognized learning difficulties. Effective reassurance and an explanation for how symptoms occur help to establish a therapeutic alliance between the family and the clinician.

G2d. Abdominal migraine

The pain centers at midline and last two hours to several days with intervening symptom-free interval. The diagnostic criteria include two of the following features: headache during episodes; photophobia during episodes; family history of migraine; headache confined to one side only and an aura or warning period consisting of either visual disturbances, sensory symptom or motor abnormalities. Prophylaxis with pizotifen or cyproheptadine is effective in some patients.

G2e. Aerophagia

The diagnostic criteria include two or more of the following: air swallowing; abdominal distension; and repetitive belching and/or increased flatus. Treatment consists of effective reassurance and explanation for the parents and child.

G3. Functional diarrhea

It is defined by daily painless recurrent passage of three or more large unformed stools, in addition to all these characteristics: onset of symptoms begins between 6 and 36 months of age; passage of stools occurs during waking hours; and there is no failure to thrive. A meal fails to interrupt the migrating motor complex. Children recover spontaneously and usually no treatment is necessary. This disorder is not commonly seen in Thai infants and children.

G4. Disorder of defecation

G4a. Infant dyschezia

The infant has prolonged crying and straining to pass a normal to soft stool in the first several months of life. It is thought that the underlying abnormality is failure to coordinate relaxation of the pelvic floor with the increase in abdominal pressure used to pass the stool. Anorectal examination should be performed to exclude any anatomic abnormalities. This is usually a self-limited problem. Reassurance is all that is required. Rectal stimulation with suppositories, thermometers, and enemas should be avoided.

G4b. Functional constipation

The infants and children have at least two of forms of stool: pebble-like hard stool which is more frequent, and firm stool two or less times per week. There is no evidence of structural, endocrine or metabolic diseases. Fruit juices, lactulose and high fiber are recommended for treatment.

G4c. Functional fecal retention

The diagnostic criteria are: passage of large diameter stools at interval less than 2 times per week; and retentive posturing, avoiding defecation by purposefully contracting the pelvic floor. It is secondary to the child’s attempts to avoid defecation because of fear associated with the passage of stool. During defecation, the child resists passage by contracting the external anal sphincter. When this is
done repeatedly, the stool accumulates and gets larger and harder, and a fecal mass may develop. At times, fecal soiling may ensue. Commonly, there may be cramping, decreased appetite, and irritability. Some younger children manifest obvious retentive posturing by crossing their legs.

A careful inspection of the lumbosacral region as well as neurologic examination should be performed to exclude spinal abnormalities. No laboratory studies are generally required. The first step of treatment includes a careful explanation of the problem to the patient and family followed by a plan to evacuate the fecal mass, and then a maintenance program to ensure soft stools and evacuation frequently enough to ensure comfort. Disimpaction phase can be accomplished with oral laxatives or enemas if the mass is not too large. Mineral oil or lactulose is used in a maintenance phase. A high-fiber diet with adequate fluid intake is outlined. In children of appropriate age, it is expected that toilet sitting will occur for 5 to 10 minutes after meals to take advantage of the gastrocolic reflex.

G4d. Functional non-retentive fecal soiling

It may be a manifestation of an emotional disturbance in school-aged child. Defecation occurs into places and at times in appropriate to social context in the absence of structural or inflammatory disease without sign of fecal retention. The goal of treatment is to help parents acknowledge the absence of organic disease and accept at referral to a mental health professional.

REFERENCES