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Vomiting

Patients with mitochondrial disease often have some degree of gut dysmotility which can affect any level of the gut. This can result in problems that can include problems with swallowing, gastroesophageal reflux, delayed gastric emptying, pseudo-obstruction, painful abdominal distention, and chronic constipation sometimes alternating with diarrhea. Excessive food intake at one time may not be tolerated, and many patients learn that "grazing" (i.e., eating and drinking small amounts and volumes throughout the day) is better tolerated than eating meals. Situations that aggravate a person's autonomic status (dehydration, significant heat exposure) can also aggravate or precipitate vomiting as can overactivity, fatigue, and/or excitement in some patients. Dysmotility can worsen during acute (especially viral) infections and anesthesia, slowing gastric motility further which leads to vomiting. It may take several days or even a few weeks for the gut to recover to its baseline level of function. Finally, endocrine conditions like diabetes mellitus can cause gastroparesis (Duby, 2004).

Boles et al noted that in many patients with cyclic vomiting syndrome (associated with recurrent nausea, vomiting, and lethargy), the maternal inheritance and mDNA variations suggest a mitochondrial etiology (Boles, 2005). Those patients who also have with neuromuscular and autonomic symptoms show an earlier onset to their vomiting.

Migraine and abdominal migraines may cause recurrent vomiting in mitochondrial disease.

Autonomic dysregulation impacts gastrointestinal function (Zelnik, 1996; Axelrod, 2006). Vomiting can worsen when autonomic symptoms become more prominent, e.g., following prolonged exposure to heat or pronounced dizziness associated with orthostasis (SEE AUTONOMIC DYSREGULATION). Other symptoms of autonomic dysfunction might be present including temperature dysregulation, abnormal (usually low) basal body temperature, heat and cold intolerance, abnormal sweating patterns, tachy- and bradycardia, dizziness, orthostatic changes in heart rate and blood pressure, and bladder dysfunction.

Some patients have associated immune dysfunction which may predispose them to infections that cause vomiting (e.g., sinusitis) or which affect them in a way that increases their likelihood to vomit (e.g., by aggravating gut motility).

Uncommonly, a patient's particular mitochondrial disease is associated with metabolic acidosis, hyperammonemia, and/or hypoglycemia. This is usually determined as part of the diagnostic process. Nausea and vomiting can be a feature of biochemical worsening.

Finally, the trigger for vomiting could be pancreatitis.

Mitochondrial Differential Diagnosis

1. GI -

    a. Gastroesophageal reflux

    b. Gastroparesis

    c. Intestinal dysmotility

    d. Pseudo-obstruction

    e. Aggravated dysmotility in association with acute infection or anesthesia

    f. Pancreatitis

2. Neurologic -

    a. Migraine (abdominal)

    b. Fatigue

3. Autonomic dysregulation and/or worsening

4. Endocrine -

    a. Diabetes mellitus

5. Vomiting associated with biochemical disturbances.

6. Vomiting associated with infections.

7. Cyclic vomiting syndrome

8. Vomiting associated with pancreatitis

Assessment and Recommendations

When vomiting leads to dehydration, IV fluids are worthwhile and will often shorten the duration of the episode, especially when provided early in the course. 10% dextrose with electrolytes is appropriate (see PROTOCOL - FEVER AND INFECTION), along with anti-emetics. IV support should continue until the patient is able to tolerate enteral fluids.

1. Considerations:

    a. Consider non-mitochondrial causes of vomiting.

    b. Determine what symptoms are associated with the vomiting and whether or not there are any trigger factors.

2. GI causes:

    a. Assess for reflux and delayed gastric emptying. Does the patient have post-prandial pain? Is the patient unable to eat a large amount at one time?

    b. Is the patient a grazer (perhaps suggesting that the patient can't tolerate easting big meals) or a meal-eater?

Recommendations:

1. Gastroenterology referral as appropriate (particularly one knowledgeable in but motility issues).

2. If reflux is present, a trial of anti-reflux medication should be considered.

3. Neurologic causes:

a. Assess for headaches and migraine. Are there associated symptoms such as an aura, increased sensitivity to light or sound, or nausea or vomiting? Is there a family history of migraine?

b. Determine from family members and other observers whether or not fatigue is a triggering factor.

Recommendations:

1. Ask the patient or family to keep a headache record and note and score the

associated symptoms;

2. If headaches or migraine - see HEADACHE.

3. If activity or exhaustion are triggering agents, encourage a schedule in which there are frequent resting periods and adequate sleep.

4. Autonomic dysregulation:

a. Assess for autonomic dysfunction and those factors that can cause autonomic dysfunction: temperature dysregulation, abnormal (usually low) basal body temperature, heat and cold intolerance, abnormal sweating patterns, tachy- and bradycardia, dizziness, and bladder dysfunction.

Recommendations:

1. Evaluate for vascular dysautonomia, and look for orthostatic changes in heart rate and blood pressure which can cause fatigue and dizziness.

2. If fluid or calorie intake is low, encourage fluids and/or calories. A trial of IV fluids might improve symptoms and support an autonomic etiology.

3. See AUTONOMIC DYSREGULATION.

5. Endocrine:

a. Assess for diabetes mellitus.

Recommendations:

1. Refer to an endocrinologist for evaluation and management.

6. Biochemical disturbances:

a. Does the patient have a history of metabolic acidosis or hyperammonemia or

hypoglycemia associated with symptoms?

Recommendations:

1. If this has not already been determined, checking on one or two occasions (when symptoms are present) may be worthwhile; if not discovered, there is usually no reason to keep looking.

7. Infections:

a. Does the patient develop recurring infections (e.g., sinusitis)?

Recommendations:

1. Recurring infections may require prophylaxis or more aggressive intervention (e.g., by an ENT specialist for recurring sinusitis);

2. Some patients have an immune defect, and an immunology referral may be indicated to assess the value of treatments such as prophylactic antibiotics or intravenous immunoglobulin (IVIG).

References

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