NTM Patient Education Program

GI Disorders

Abraham Khan, MD
Assistant Professor of Medicine
Director, Center for Esophageal Disease
NYU Langone Medical Center
Outline

- Importance of overall nutrition

- Could your NTM be associated with a GI condition?
  - Potential relationship with esophageal disorders
Nutrition

• Role of nutrition in NTM: important and part of treatment plan
  • Balanced diet
  • Maintaining healthy weight
    • Reasons for weight loss
      • Response of body to NTM and increased calorie needs
      • Nausea, medication side effects, and decreased appetite
    • Body mass index (BMI)
      • Underweight: BMI < 18.5: focus on weight gain
      • Normal weight: BMI 18.5-24.9
      • Overweight: BMI 25-29.9
      • Obese: BMI ≥ 30
Nutrition Tips

• If appetite is poor: ask your doctor for help
  • First assess underlying cause: depression, nausea, pain, and dry mouth
  • Ask about medications to improve ability to avoid symptoms during meals
  • Consider an appetite stimulant
  • More calories
    • Small and frequent meals
    • Oral supplements

• *Meet with a registered dietician for help*
  • Calorie counting and goals
  • Advice on specific meals
NTM and Esophageal Disorders

• First...how could they be related?
The Basics

- The Esophagus
  - Tubular structure
    - Major purpose: transport swallowed food from throat to stomach
  - Length: 18 to 22 cm on average
Swallowing
Esophageal Disease

- Gastroesophageal Reflux Disease (GERD)
  - Definition: a condition that develops when the reflux of stomach contents causes troublesome symptoms and/or complications.
Symptoms

• Typical symptoms
  • Postprandial heartburn
  • Effortless regurgitation

• Atypical symptoms
  • *Potentially* due to GERD
  • Includes trouble swallowing, chest pain, cough, hoarseness, excessive throat clearing, wheezing, feeling of a lump in the throat

• *Silent GERD*
Potential Complications

- Acid aspiration causes bronchospasm and inflammation
- Nerve stimulation causes reflex bronchospasm
- Acid reflux into the esophagus

- Sinusitis
- Laryngitis, laryngospasm
- Bronchitis, Asthma
- Pneumonia
Esophageal Swallowing Disorders

• An esophageal motility (neuromuscular) disorder: problem with pushing food and/or liquid through esophagus into stomach

• Examples
  • Esophageal spasm, achalasia

• Can result in swallowed contents ascending up into airway

• Mild: may not have trouble swallowing

• Severe: significant trouble swallowing, risk of large amounts of fluid coming “back up” and into airway
Current Knowledge

• 2007 study of 58 patients with NTM
  • 26% had GERD by pH study and of these only 27% had typical symptoms of GERD
  • The GERD patients had worse bronchiectasis and lung inflammation on imaging

• 2011 review on bronchiectasis and GERD
  • Included many patients with NTM
  • Large amount of patients (studies 26% to 75%) with bronchiectasis have symptomatic or ‘silent’ GERD
  • GERD may influence severity of bronchiectasis
  • *Cause and effect has not been established*

1Koh et al. Chest 2007
2Lee et al. Pulm Med 2011
Current Knowledge

- Treatment of GERD may also have consequences
- Many patients are on proton pump inhibitors (PPIs) to decrease the acidity of the stomach

### Table. Evidence Supporting the Potential Adverse Effects of Proton Pump Inhibitor Drugs

<table>
<thead>
<tr>
<th>Source</th>
<th>Adverse Effect</th>
<th>Adjusted OR (95% CI)</th>
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</thead>
<tbody>
<tr>
<td>Lazarus et al, 2015</td>
<td>Chronic kidney disease</td>
<td>1.50 (1.11-1.90)</td>
</tr>
<tr>
<td>Antoniou et al, 2015</td>
<td>Acute kidney disease</td>
<td>2.52 (2.27-2.79)</td>
</tr>
<tr>
<td>Antoniou et al, 2015</td>
<td>Acute interstitial nephritis</td>
<td>3.00 (1.47-6.14)</td>
</tr>
<tr>
<td>Cheungsitporn et al, 2015</td>
<td>Hypomagnesemia</td>
<td>1.43 (1.08-1.88)</td>
</tr>
<tr>
<td>Kwok et al, 2012</td>
<td>Clostridium difficile</td>
<td>1.74 (1.47-2.85)</td>
</tr>
<tr>
<td>Eom et al, 2011</td>
<td>Community-acquired pneumonia</td>
<td>1.34 (1.14-1.57)</td>
</tr>
<tr>
<td>Filion et al, 2014</td>
<td>Community-acquired pneumonia</td>
<td>1.05 (0.89-1.25)</td>
</tr>
<tr>
<td>Zhou et al, 2015</td>
<td>Bone fracture</td>
<td>1.33 (1.15-1.54)</td>
</tr>
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Abbreviation: OR, odds ratio.
Questions Needing Answers

• Does GERD predispose a patient to develop NTM?

• Can GERD make NTM worse?

• Can treating GERD with PPIs make NTM worse?

• If GERD is involved, is the problem from acid, bile, or any type of reflux?

• How should we treat GERD in patients with NTM?

• Could an esophageal motility or swallowing problem complicate the picture?
Procedures to Help

- Upper endoscopy
  - Procedure through mouth with anesthesia
  - Good for looking at lining of esophagus and excluding complications in the esophagus from GERD
  - Cannot disprove GERD
  - Minimally useful for motility of the esophagus
Acid Reflux Procedure

• pH study #1:
  wireless pH capsule

  • Small capsule placed on endoscopy

  • Transmits acid data to recorder for 48-96 hours

  • Capsule falls off on own and does not need another procedure to retrieve

  • Recorder returned by patient when recording stopped
Other Reflux Procedure

- pH study #2:
  - pH-impedance testing
  - Catheter through nose and into stomach, attached to a recorder worn by patient
  - Records acid, bile and all reflux for 24 hours
  - Recorder returned the next day by patient and data is then downloaded
Swallowing Procedure

- Esophageal manometry
  - Deciphers if there is a motility problem in esophagus
  - Catheter placed through the nose and attached to computer on the outside of body
  - Study takes 5 to 10 minutes, about 10 swallows of liquid needed
  - Catheter is then removed and data is interpreted by physician
Current Goal

• Until more research is developed to answer the aforementioned questions…

• *Utilize specialty esophageal testing to identify and appropriately treat esophageal disorders in our patients with NTM*
Thank You

Contact Information:

Abraham Khan, M.D.
Office: 212-263-3095