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Management of GERD in the Elderly: Are PPIs appropriate?

Corissa L. Anderson

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Abstract

Gastroesophageal reflux disease (GERD) is caused by gastric contents repeatedly exposed to the esophageal tract and is commonly treated with proton pump inhibitors (PPIs). The use of PPIs has increased in the elderly population and consequently concern has been raised regarding their potential long term effects. Due to comorbidities and polypharmacy, the elderly are at greater risk for complications to treatment and management. Therefore, appropriate documentation is necessary with the increase in PPI use. Providers must have medical reasoning documented prior to prescribing PPIs for upper gastrointestinal issues. In this paper, the management and prevalence of GERD in the elderly will be identified along with the determination if PPI use is appropriate for the management of GERD. In addition, the side effects and prevalence of PPI use in regards to the treatment options of GERD in the elderly population will be covered. Eleven journal articles were reviewed regarding PPI use for GERD in the elderly, long term effects, contraindications, education, and monitoring recommendations. In conclusion, providers need to be aware of comorbidities and current medications in the elderly to appropriately manage upper GI disorders.

Management of GERD in the Elderly: Are PPIs appropriate?

Background

There have been several studies over the past 8 years that have linked PPI use to negative adverse reactions and ultimately scrutinizing their use. The most recent scrutinizing study has linked the use of PPIs to increasing the risk of dementia. “German researchers found that people 75 or older who regularly take the medication had a 44 percent increased risk of dementia, compared with seniors not using the drugs” (Thompson, 2016, p. 1). Other studies address the importance of the provider’s need to be cautious when prescribing PPIs for the elderly population. Providers need to be knowledgeable and educate their patients regarding the risks and benefits of PPIs along with being cautious due to the elderly population’s potential comorbidities and polypharmacy. PPIs have been proven effective when prescribed for the correct diagnosis and they are favored by providers for their positive effects on upper gastrointestinal diagnoses such as GERD. These contributing factors have led to the increased use of PPIs by providers in both hospitals and primary care. According to Coggins (2014), “in the United States, PPIs are the third highest selling class of medications” (p. 6).

Though it has been proven that PPIs are safe and effective for patients across the life span, are they truly safe for the elderly population? More treatment options for GERD may be needed in the elderly population since “GERD is the most common upper gastrointestinal disorder seen in the elderly” (Chait, 2010, p. 388). The underlying cause of GERD symptoms raise concern for further evaluation to establish a diagnosis. The symptoms of GERD are minimal in the elderly “possibly due to a decrease in esophageal pain perception and atrophic gastritis” (Chait, 2010, p. 390). When an elderly patient presents with a new onset of GERD symptoms, providers need to further evaluate to rule out an underlying cause.

The purpose of this report is to bring awareness to providers regarding the use of PPIs in the elderly population. Providers need to have a documented diagnosis prior to implementing treatment. “The Centers for Medicare & Medicaid Services (CMS) Medicaid Integrity Group has issued a statement noting that PPIs are widely prescribed outside of the FDA-approved product labeling for indication, age, dosage, or duration,” (Coggins, 2014, p. 6). The plan for GERD symptoms presented may be either a trial of a PPI for a short duration or a diagnostic evaluation to establish a concrete diagnosis. Providers also need to be well educated on the potential adverse reactions when prescribing PPIs for the elderly. Common adverse reactions include rebound hypersecretion, decrease in vitamin B12, magnesium or calcium absorption, increase of *Clostridium difficile* (C. diff) infections, or the reduction of the effectiveness of bisphosphonate medications when they are taken for prevention of hip fractures. Additionally, providers also need to be cautious about over prescribing PPIs. “PPI overuse in the outpatient setting is initiated by prescription for undocumented or unsubstantiated diagnoses” (Heidelbaugh, Kim, Chang & Walker, 2012, p. 221). Therefore, the overuse of PPI treatment has brought awareness and close monitoring of PPI use for undocumented and unsubstantiated reasons.

Case Report

The following report summarizes the clinic visit with E.L. which prompted research into PPI use for GERD in the Elderly population.

Patient Profile:

Name: E.L.

Age: 88

Gender: F

Date of Exam: 03/10/2017

History of Present Illness: E.L. presents today, alone, for a cough that has not gone away for the past two months. E.L. was treated for bronchitis, 2 months ago, with guaifenesin plus

codeine cough syrup and an ipratropium inhaler. Both prescriptions were a one-time fill and are currently empty. Reports minimal relief from these prescriptions. Denies generalized pain. Has pleuritic chest pain with coughing, rates 5/10. Her coughing is worse when she lies down at night and upon first waking in the AM. Her cough is followed by a tickle in her throat. Also, has been noticing a burning and awful taste in the back of her throat that is induced by lying down. Has been taking OTC TUMS after every time she eats, moderate relief received with TUMS. No particular foods make the symptoms worse. Patient denies excessive use of NSAIDs. Patient started her Lisinopril 2 years ago and has not noted any side effects since starting it. Denies symptoms of allergies.

Current Medications:

Lisinopril 10 mg Daily
Tums Regular Strength 1-2 tablets PRN after meals

Allergies:

No known allergies

Past Medical, Surgical and Procedural History:

Essential Hypertension
Heart murmur-congenital
Diabetes
Umbilical Hernia Repair; scheduled for future umbilical hernia revision

Immunizations: Reviewed; patient is up to date on all immunizations

Developmental, Obstetrical/Gynecological, and Functional History: Discussed minimally during this visit. Full term births to 3 children, cesareans for all three.

Family History: Not discussed in detail of what family members had what disease. Diabetes, Heart Disease and Colon CA established as family medical history.

Social History: Lives alone. Widowed.

Review of Systems:

Constitutional: Feels well, no weight loss, fever, malaise or night sweats.
Cardiovascular: No chest pain or palpitations, murmur.
Respiratory: No shortness of breath. Dry, nonproductive cough for 2 months. Positive for pleuritic chest pain.
Hematological: negative
Gastrointestinal: Denies, nausea, vomiting or hematochezia. See HPI regarding gastric reflux symptoms.
Genitourinary: No hematuria.

Physical Examination:

Vitals: BP-130/80, P-76, Temp-97.8 F (oral), RR 16
General Appearance: Healthy; alert and oriented x3; no acute distress

EENT: Pupils equal and round. Tympanic membranes pearly gray, intact and without redness. Supple neck without lymphadenopathy. Mild erythema noted on back wall of pharynx. Halitosis present.

NECK: Supple with no nodes or jugular venous distention.

LUNGS: Normal respirations; good expansion with good diaphragmatic excursion; clear to auscultation without wheezes or crackles.

HEART: Irregular Regular rhythm and regular rate; S1 and S2 normal; no murmurs, heaves, thrills, clicks or rubs

ABDOMEN: Soft, rounded, periumbilical hernia present. Epigastric tenderness with palpation.

EXTREMITIES: No cyanosis, clubbing or edema; radial pulses strong and equal bilaterally;

Assessment/Plan:

1. GERD (K21.9): Instructed patient to limit foods that aggravate her GERD; incline the head of bed, and limit food intake 2 hours prior to bedtime. Start taking omeprazole 20 mg once daily. I would like you to take the omeprazole for 2-3 weeks before determining if it is effective. If it is moderately effective at 1 week we can increase the dose to 40 mg. If it is not effective after 2 weeks, we will reevaluate and potentially change the treatment. This time frame will also allow us to review the results of your EGD. An EGD order was placed to verify GERD diagnosis and to rule out Barrett's Esophagus or adenocarcinoma. The following labs were ordered today to determine electrolyte and vitamin levels: BMP, Hemogram, magnesium and calcium.

Education was provided today regarding adverse reactions, monitoring of the drug, risks and benefits.

Follow up in 3 weeks for recheck of GERD symptoms. Please schedule follow up earlier if symptoms worsen and/or do not improve.

Summary of Case Report

The patient's medical history did not reveal a history of GERD symptoms. At this visit it raises concern that her cough has persisted after treatment for bronchitis. Further evaluation was necessary to determine a possible underlying condition that has caused her persistent cough. It has been found that "as patients age, the severity of heartburn diminishes, while its complications become more frequent" (Scholl, Dellon & Shaheen, 2011, p. 386). She did not receive relief from the TUMs, which raises a red flag to order further testing to rule out an underlying cause of her GERD symptoms. The diagnoses to rule out are, "esophagitis, esophageal stricture, Barrett's esophagus and esophageal cancer, which are found to be more frequent in the elderly population" (Shams, Siddiqui & Heif, 2009, p. 1). Her minimal comorbidities and medications

likely did not contribute to the underlying cause of her persistent cough. Also, the importance of knowing if she has a history of hypocalcemia, hypomagnesemia, or low iron and vitamin B12 relates to the effects of PPIs altering the “absorption of vitamin B12, iron, calcium and magnesium is receiving particular attention recently, because of the widespread maintenance use PPIs” (Ito & Jensen, 2010, p. 448). If the patient is already deficient in these nutrients, it would not be appropriate to start her on a medication that would add to deficiency.

The diagnostic plan should include an Esophagogastroduodenoscopy (EGD), BMP, Hemogram, magnesium and vitamin B12. The EGD would rule out esophageal stricture, Barrett’s esophagus or esophageal adenocarcinoma. The lab results would indicate deficiencies that deter from using a PPI for treatment of GERD symptoms. “The goal of treatment is to control symptoms at the lowest dose and for the shortest possible duration” (Health News and Evidence, 2014, p. 1). A short 2-3-week trial of the lowest dose of a PPI would be initiated with intent to taper up after 1 week if needed. During the PPI trial the diagnostic tests will be performed. The patient was educated regarding the possible side effects including symptoms of intestinal tract infection, community acquired pneumonia, gastric polyps, hypergastrinemia, C. diff, drug-drug interactions, increase risk for hip, wrist and spine fractures, vitamin and nutrient deficiencies.

Literature Review

Due to the aging population in the medical field it is important to know everything there is to know about diagnosis, diagnostic evaluation and treatment options of GERD in the elderly. Are PPIs an appropriate treatment option for the elderly population? Do the benefits outweigh the risks when it comes to quality of life? The care of GERD is more challenging in the elderly due to concurrent comorbidities, medication interactions, and the physiology of aging (Scholl et

al., 2011). “Several of the adverse effects of gastric acid suppressants that have been documented are pertinent to the older people” (Logan, Sumukadas, & Witham, 2010, p. 410).

Age-Related Risk Factors for PPIs

As mentioned earlier, heartburn symptoms are rare in the elderly population. A study of 12,000 people (age 18-75) was conducted to see the relevance of presented heartburn as it relates to endoscopic findings of erosive or severe esophagitis. The 70+ population was found to have 10% more severe or erosive esophagitis with the presence of heartburn. Instead of the typical symptoms of GERD, the elderly may instead complain of respiratory symptoms and/or vomiting. “Any patient with alarming symptoms such as weight loss, anemia, dysphagia, or GI bleeding should undergo a screening endoscopy” (Scholl et al., 2011, p. 390). Elderly patients experiencing these symptoms may indicate an underlying condition that is more severe than the typical surface presentation of GERD such as esophageal adenocarcinoma.

The normal changes in the aging body can contribute to the presentation of GERD and a patient may present with GERD symptoms for the first time in their elder years. One of the researchers found “incompetence of the lower esophageal sphincter (LES) to be more prevalent in the elderly, which permits acid reflux, especially when intra-abdominal pressure rises” (Shams et al., 2009, pp. 1-2). Common causes that can lead to LES in the elderly are medications that decrease the tone such as nitrates, calcium channel blockers, benzodiazepines, anticholinergics or antidepressants. “Several studies have demonstrated altered esophageal motility in the elderly as the primary factor causing GERD” (Shams et al., 2009, p. 2). The decrease in esophageal motility can be caused by several drugs including NSAIDs, iron sulfate, gelatin capsules, steroids, potassium chloride tablets, antibiotics and bisphosphonates. Also, there are some diseases that increase the risk for GERD including CVAs, diabetes, and Parkinson’s disease.

Therefore, treating the elderly patients for GERD with a PPI can bring about complications due to the normal aging body, polypharmacy and/or comorbidities.

Adverse Effects of PPIs

The first complication of PPI use is susceptibility to cholera and bacterial overgrowth from species of *Clostridium difficile* and *Shigella*. Overgrowth occurs as a result of PPI-induced acid suppression which makes it a more appealing environment for bacteria to grow and causes GI upset. Patients should take extra caution with ingested contaminated or spoiled food along with proper hygiene to prevent these GI tract infections from occurring. Other bacterial complications correlated to PPI use are upper respiratory infections (URIs) and pneumonia caused by pulmonary micro-aspiration and lung colonization (Farrell, 2014). Finally, long term PPI use has been linked to the development of gastric polyps caused by a reduction in acid-producing parietal cells (Farrell, 2014). As a result, the body will create more cells to take over for the cells that are not producing acid leading to the formation of polyps.

PPIs have also been gaining attention in regards to their effects on gastric absorption of calcium, magnesium, vitamin B12 and iron. The decrease in nutrient absorption is coming into light due to the increase in bone fractures of the elderly that have been on long term PPI use. Since 2006, ongoing studies have correlated long term PPI use with hip fractures leading to the Food and Drug Administration (FDA) to issue the following warning in May 2010: “possible increased risk of fractures of the hip, wrist, and spine with high doses or long-term use of a class of medication called proton pump inhibitors” (Ito & Jensen, 2010, p. 4). Many studies suggest that PPIs are causing the fractures but it is actually due to the effects PPIs have on the absorption of calcium. “It has been suggested that PPIs may interfere with calcium absorption through induction of hypochlorhydria, and may reduce bone resorption through inhibition of osteoclastic

vacuolar proton pumps” (Teramura-Gonblad, Hosia-Randell, Muurinen, & Pitkala, 2010, p. 154). This leads to a higher risk of bone fractures, especially in the elderly population due to their potential risk of osteoporosis as they age. In addition, elders that are on bisphosphonate medication should not be on a PPI long term. “Patients over the age of 70 taking PPIs with the bisphosphonate alendronate experienced a significantly increased fracture risk, and when PPI therapy was given together with alendronate for 2 years or more, the potential for hip fracture protection was negated” (Coggins, 2014, p. 6). One study in Canada found, “no statistically significant association between the use of PPIs and the occurrence of an osteoporotic fracture within 1-6 years of defined continuous PPI therapy, but found that this risk was elevated after 7 years of continuous therapy” (Heidelbaugh et al., 2012, p. 226). This is not a strong enough causative factor to raise concern when initially prescribing a PPI, however it should raise concern to monitor the patient’s risk through the continued years of use.

In studying the effects of PPI use on vitamin B12 levels it was found that “the presence of gastric acid is needed for the pancreatic proteases to cleave the vitamin B12 from the protein” (Ito & Jensen, 2010, p. 2). With PPI use, gastric acid is suppressed leading to decreased absorption of vitamin B12. Vitamin B12 deficiency, at baseline, is a common disorder in the elderly which may cause gait disorders, falls, depression and dementia. Treatment for this deficiency requires close monitoring with lab draws and supplementation. The studies of the effects of PPIs on iron are ongoing due to the current studies being controversial. So far, studies have only concluded that the use of PPIs has only decreased iron absorption in animals that were on a low iron diet. Also, the effects of PPIs on magnesium are poorly researched. The National Institute for Clinical Excellence (NICE) that has introduced guidelines on PPI but “[they] have had little impact on clinical practice with results of only 38.6% of PPI prescribing being

appropriate” (Teramura-Gronblad et al., 2010, p. 158). In conclusion, the high rate of PPI prescriptions, the reduction of the severity of side effects, and the absence of the benefits for low-risk patients make any PPI prescription raise concern or questions. More research needs to be done on the effects of PPIs in relation to gastric absorption of nutrients viable to the human body, especially in the elderly.

PPI Prescribing

There has been several years of studies focusing on appropriate versus inappropriate use of PPIs, specifically in the elderly. “Evidence-based guidelines supporting PPI use as the superior treatment of GERD, nonerosive reflux disease, erosive esophagitis, dyspepsia, and peptic ulcer disease have guided clinicians in efficacious treatment since their release in the late 1980s” (Heidelbaugh et al., 2012, p. 219). However, PPI prescriptions are somewhat “out of control” due to the undocumented and unsubstantiated uses. “A study conducted in Ann Arbor, MI Veterans’ Administration hospital determined that of 946 patients, only 35% were prescribed PPI therapy for an appropriate documented upper GI diagnosis, 10% received PPIs empirically for symptomatic treatment based on extraesophageal symptoms, 18% received PPIs for gastroprotection, and 36% had no documented appropriate indication for the PPI therapy” (Heidelbaugh et al., 2012, p. 220). A subgroup analysis was performed and found, “49% of the patients across all four categories received PPIs without documentation of re-evaluation of upper GI symptoms” (Heidelbaugh et al., 2012, p. 220). In another study conducted through a Boston, MA health plan evaluated prescriptions through a pharmacy audit. This study focused on 168,727 patients that were taking PPIs or histamine 2 receptors for more than 90 days. The result was more appropriate than the previous study with 61% of the 168,727 patients having appropriate upper GI diagnosis; “the most common diagnoses being dyspepsia (42% of total)

and GERD (38% of total)” (Heidelbaugh et al., 2012, p. 220). “Approximately 39% of patients in this study lacked appropriate documentation for any upper GI diagnosis, while almost 50% had documented symptoms of extraesophageal manifestation of potential upper GI disease” (Heidelbaugh et al., 2012, p. 221). In conclusion of these two studies, it was found that PPI prescription overuse is supported by findings of undocumented or unsubstantiated use. The overuse of PPIs has not stopped with the ambulatory setting.

Many critical care settings in hospitals are using PPIs for stress ulcer prophylaxis (SUP). However, the first line of treatment should be the histamine 2 receptor agonists (H2RAs). “H2RAs are generally recommended as the agents of first choice for SUP in patients who are critically ill with risk factors for physiological stress-related bleeding, including respiratory failure, coagulopathy, sepsis, severe hypotension, acute renal failure, major trauma, burns, spinal cord injury, organ transplantation, Glasgow Coma Score up to 10, surgery, high-dose corticosteroid therapy, renal failure, or ICU stay of at least 6 days” (Heidelbaugh et al., 2012, p. 221). While performing this research it was found that PPIs are the first choice of critical care physicians. “One study examining cardiothoracic surgery patients taking SUP found pantoprazole, but not ranitidine, was associated with an increased risk of hospital-acquired pneumonia” (Logan et al., 2010, p. 410). This hospital-associated risk can be carried on into post hospitalization care especially if the patient is discharged to a skilled nursing facility, short term rehab or assisted living. This is especially a problem if they are on oral PPIs or H2RAs in hospital since the risk of a patient being discharged on a PPI or H2RA decreases if they are on IV form. Two trials were then conducted at the University of Michigan that evaluated SUP in non-ICU patients and the incidence of these patients being discharged on PPIs. “One study of 213 patients found that 33% were taking PPIs prior to admission, which increased to 84% during

admission” (Heidelbaugh et al., 2012, p. 222). Of this total, 10% had an acceptable indication for the PPI use. The number one use of PPI prophylaxis was for prevention during corticosteroid use. “The second study of 1769 patients found that 22% received SUP with PPIs, none of whom met evidence-based criteria for appropriate SUP, and 54% were subsequently discharged home on PPIs” (Heidelbaugh et al., 2012, p. 222). Follow up medication review is necessary to determine continued need for PPI therapy.

All of the studies conducted did not relay if the need for PPI post discharge was needed. However, it was found that “physicians in ambulatory care settings and nursing homes often are hesitant to discontinue PPI therapy ordered by other physicians, especially when it is not clear why a PPI was prescribed” (Coggins, 2014, p. 6). The discharging providers should include the indication and duration of the PPI use so they can be better managed post hospitalization. Usually when the PPI is used for SUP during hospitalization it is not needed post hospitalization. The primary care provider should take note of it during follow up from the hospital and assess for signs/symptoms of upper gastrointestinal issues that would require a PPI.

GERD Treatment

Along with GERD being the most common upper gastrointestinal disorder seen in the elderly; “the worldwide incidence of GERD is increasing as the incidence of *Helicobacter pylori* is decreasing” (Chait, 2010, p. 388). “It is estimated that GERD affects 18.6 million people in the United States” (Chait, 2010, p. 388). The effect of GERD on the elderly has a direct impact on their life, especially those with nighttime GERD. Sleep is already a challenge for the elderly and therefore when nighttime GERD symptoms are added on to their baseline sleep disturbance, it results in other health concerns that are affected by poor sleep hygiene. One study found that “63% of patients with nocturnal symptoms of GERD reported that sleep was negatively affected”

(Chait, 2010, p. 389). Sometimes nighttime GERD symptoms are the only symptoms presented by the elderly. “The frequency of severe heartburn seems to decline with age, possibly due to a decrease in esophageal pain perception and atrophic gastritis,” (Chait, 2010, p. 389). With the typical signs and symptoms of GERD absent or diminished in the elderly population; the need for further evaluation with an EGD is recommended due to the increased incidence of severe and life threatening complications in the elderly population. As a provider, it is important to be aware of the extraesophageal symptoms in addition to the standard symptoms of GERD. Elderly usually present with extraesophageal symptoms which include, “atypical chest pain that can simulate angina pectoris; ear, nose and throat (ENT) manifestation such as globus sensation, laryngitis, and dental problems; pulmonary problems such as chronic cough, asthma, and pulmonary aspiration and sleep apnea” (Chait, 2010, p. 390). While the provider is waiting for the EGD to be completed, “a trial of a high dose PPI such as omeprazole 60 mg can be used for 7 days, and observed for improvement in their clinical response” (Chait, 2010, p. 391). Therefore, a more aggressive approach in the elderly is necessary as opposed to our younger generations due to the high incidence of complications derived from adenocarcinoma or Barrett’s Esophagitis. If PPI treatment is deemed appropriate, close monitoring will be necessary especially for long term use due to the effects with long term use. PPIs are safe for long term use if the primary care provider is closely monitoring the patient for the potential side effects that apply to them.

Over time PPIs have revolutionized the treatment of multiple upper gastrointestinal disorders with minimal to moderate adverse effects. All comorbidities and current medication use by the individual should be considered into the equation when starting a PPI. Amongst all the literature reviewed, it was agreed upon that the overall effects of PPI therapy generously

outweigh the risks. However, when treating a patient that is frail, malnourished, chronically ill and/or elder it should raise awareness to the providers to closely monitor PPI therapy and outweigh the benefits against the risks.

Learning Points

First, establish an appropriate diagnosis to support the prescribing of PPI therapy in the elder patient. When there is appropriate use of PPI therapy, the benefits will outweigh the risks.

- Prescribe the lowest dose for the shortest duration that will control the upper GI symptoms with ongoing review of PPI treatment. “Patients should not maintain long-term acid suppression therapy without ongoing symptom evaluation and dose-reduction or drug discontinuation consideration” (Coggins, 2014, p. 6).
- When a PPI is used in conjunction with anti-infective medications for the treatment of *Helicobacter pylori*, the PPI should be discontinued after 14 days of continued use.
- A reduction of the PPI should be trialed on all patients after 8-12 weeks of use when there is documented upper GI tract disorders. When relapse of symptoms occur, try a repeat course of treatment for 4-8 weeks then step down to discontinuation or a reduction of the dose (Health News and Evidence, 2014).
- “When treating GERD symptoms, step-up dosing strategies should be considered, which include starting with H2 blockers twice daily and if symptoms are not adequately controlled, discontinuing the H2 blocker and beginning once daily PPI therapy, increasing to twice daily if symptoms continue” (Coggins, 2014, p. 6).
- Education should be provided regarding lifestyle modifications such as: smoking cessation, smaller portion of meals, no eating 3-4 hours prior to bedtime, elevate the head of bed, weight loss, maintain normal weight, and avoid foods that aggravate symptoms.

- PPIs have been linked to the following adverse effects: decreased absorption of magnesium, calcium, iron, vitamin B12; GI tract infections, URIs and pneumonia so providers should exercise caution when prescribing.

By following the above recommendations, it will potentially result in a decrease of PPI use with undocumented or unsubstantiated reasons/diagnoses. Knowing and weighing in all the risks and benefits improves the overall quality of care for the elderly population when prescribing PPIs.

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