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Inside this issue:

Hospitalist Update

Case of the Month

From the Journals

ID Corner

Calendar

Comments

Hospitalist Update

Proton-Pump Inhibitors: Reducing their Unnecessary Use

Emily Coberly MD

Proton-pump inhibitors are the third largest class of medications prescribed in the United States, with more than 113 million prescriptions filled annually [4]. The use of proton pump inhibitors in hospitalized patients has increased significantly over the past several years, with 40-70% of medical inpatients receiving acid-suppressive medications. [2].

While proton-pump inhibitors (PPIs) have beneficial therapeutic and prophylactic indications for many patients, increasing evidence suggests that these medications are not without risk; inpatient use of PPIs has been shown to increase the risk of hospital-acquired pneumonia by up to 30% [2]. Community-acquired pneumonia is also more common in patients who have started PPI therapy within the past 30 days [5]. The use of proton-pump inhibitors has been associated with an increased risk of primary and recurrent Clostridium difficile infections [3]. Their long term use has also been linked to an increased risk of fractures in older adults, though the mechanism for this association remains unclear; PPI use has not been clearly linked to osteoporosis or increased loss of bone mineral density [1].

Massachusetts General Hospital recently implemented standardized guidelines for prescribing PPIs for their medical inpatients. The guidelines were reviewed with house staff during a single didactic session and were also sent out via email. While it was emphasized that clinical judgment must be used in each individual case, the guidelines limited the recommendations for IV PPIs to patients with EGD evidence of peptic ulcer disease or with non-variceal lesions at high risk of recurrent bleeding. The prophylactic use of oral PPIs was recommended for ICU patients with coagulopathy or for those requiring mechanical ventilation. The guidelines also suggested that oral PPIs be considered for prophylaxis in patients with a history of peptic ulcer disease, especially when taking NSAIDs or antiplatelet therapy [6].

Overall, 49% of non-ICU medical inpatients were prescribed PPIs during their hospital course, 36% of admitted patients were already on PPIs and 21% had documentation of appropriate indications for PPI outpatient therapy prior to release of the guidelines. After implementation, significant differences were found in the subgroup (cont)

(continued) of patients who were not taking a PPI prior to admission: in this subgroup, inpatient use of a PPI fell from 27% to 16% and prescriptions for a PPI at discharge decreased from 16% to 10% [6].

There is clearly room for improvement in reducing the unnecessary use of proton-pump inhibitors in both the inpatient and outpatient settings. As with all medications, it is important to use PPIs only when indicated and to periodically re-evaluate the need for their continued use.

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HOSPITALIST LUNCH CONFERENCE

at the

2010 Missouri ACP Scientific Meeting

September 23-26

Tan Tar A Resort, Osage Beach, Missouri

Hospitalist Lunch Conference at 12:15, Saturday, September 25

Presentations by Amy Sheldahl MD, Maniza Ehtesham MD & Dilip Bearelly MD

For information: Contact Patrick Mills 573-636-3366, pmills@msma.org

CASE OF THE MONTH Bishnu Devkota MD, Bharat Joshi MD, Barbara Whitman PhD

STROKE WITH FEVER: DON'T FORGET THE HEART!

INTRODUCTION:

Cerebrovascular accident (CVA, stroke) can be either ischemic or hemorrhagic in origin. Fever in a patient with stroke symptoms may be due to local complications of cerebral infarction (e.g. abscess), adjacent foci of infection (e.g. sinus, middle ear infection) or a distant systemic insult (e.g. aspiration pneumonia, UTI, DVT, etc.). In addition, infective endocarditis (IE) with embolization may cause both fever and stroke symptoms.

Infective endocarditis occurs on both native and prosthetic valves. Intravenous drug abuse (IDA) increases the risk of IE and septic embolization from IE may cause metastatic infection in various organs: lungs, brain, spleen, etc. Septic emboli may result in pneumonia, empyema, abdominal pain, hematuria, splenomegaly, CVA, brain abscess or subarachnoid hemorrhage. Predisposing factors for septic emboli include IDA, immunosuppressive therapy, diabetes mellitus, etc. [1]. Etiologic agents include staphylococci, streptococcus species, fungi and other organisms. At times, the diagnosis of septic embolism can be challenging and the presenting symptoms may be nonspecific (e.g. fever, night sweats, weight loss, fatigue). Septic emboli from infective endocarditis is a relatively rare cause for stroke; we present an interesting case of staphylococcus areus endocarditis that lead to septic embolization and the development of expressive aphasia.

CASE REPORT:

A forty year old right-handed white female was transferred from an outlying hospital with a two day history of fever and back pain; she became aphasic, restless and diaphoretic in the emergency room. The patient had a long history of tobacco, alcohol and IV drug abuse. In the ER, her vitals were BP 83/33, P 107, R 25 and T 101F. She had a grade III systolic murmur at the apex. Though alert, she had profound expressive aphasia; the remainder of her neurologic examination was normal. Initial labs included WBC 29,200 with a left shift, Hgb 7.4, Hct 23.5, AST 104, Cr 1.6; her UA demonstrated pyuria and bacteruria. An EKG was normal. A non-contrast CT of the brain demonstrated a 1.6 cm focus of low attenuation in the anterior-medial aspect of the right centrum semi ovale.

Even after 2 liters of normal saline she remained hypotensive and she was admitted to the ICU. Two sets of blood cultures, taken 12 hours apart, grew staphylococcus aureus. Hepatitis C antibody was positive; HIV serology was negative and her urine drug screen revealed cocaine. Coagulation panel was normal. A TTE showed an LVEF of 50-55%, mild mitral regurgitation and septal dyskinesia without obvious vegetation. A CT of the chest demonstrated infiltration in both lungs with focal consolidation and a central cavitary lesion in the right mid lung field (**see image, page 4**). An MRI of the brain revealed multiple acute infarcts in the parietal and occipital regions (**image on page 4**). Her staph enodocarditis was treated with vancomycin and rifampin. A TEE showed large, mobile vegetations on the mitral an pulmonic valves. The staphylococcus aureus proved to be sensitive to methicillin and antibiotic coverage was changed to IV Nafcillin. Her subsequent clinical course was uneventful though her expressive aphasia persisted.

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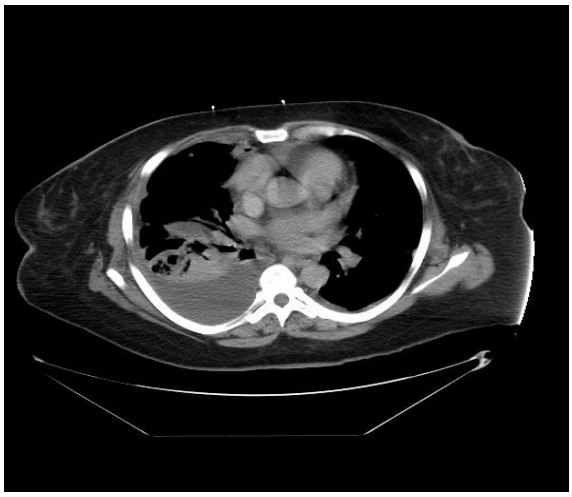

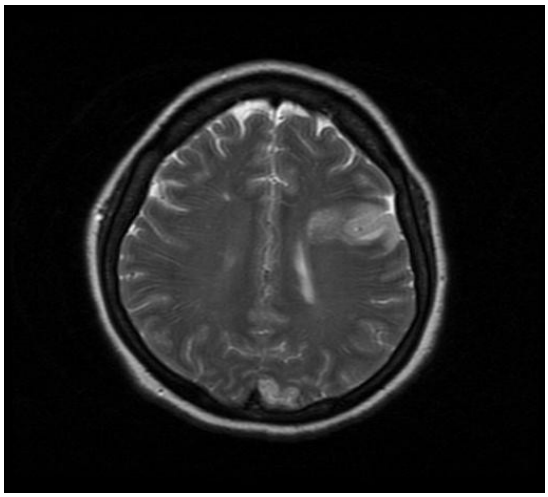

DICUSSION:

Infective endocarditis (IE) can develop on both native and prosthetic valves. Although IE can occur on normal heart valves (particularly with highly virulent organisms), a number of cardiovascular abnormalities predispose to this condition. Rheumatic heart disease remains an important risk factor in developing countries, though increasingly rare in the industrialized world. Other predisposing cardiac conditions include mitral valve prolapse, degenerative valvular stenosis, bicuspid aortic valve and both repaired and unrepaired congenital defects. Early prosthetic valve endocarditis (PVE) occurs within sixty days of valve implantation, whereas late PVE is defined as occurring after sixty days. Causative organisms include coagulase negative staphylococci, staphylococcus aureus, streptococci, gram negative aerobes, fungi, diptheroids and other agents [2]. Late PVE results from bacteremia secondary to dental procedures, genitourinary sources, gastrointestinal procedures or IV drug abuse and the etiologic agents are similar to those causing native valve endocarditis; these include strep viridians, staph epidermidis, staph aureus, gram-negative bacilli, enterococci, fungi and the HACEK group (Haemophilus species, Acinitobacter species, Cardiobacterium species, Eikenella species and Kingella species)[2]. Currently, parenteral drug addiction is one of the most prevalent causes of IE in urban medical centers in developed countries [3]. The incidence of IE among IV drug abusers in the U.S. is about 1-5% per year [3], with parenteral cocaine users having the highest risk [4]. Staphylococcus aureus is the most common organism [5,6] and the tricuspid valve is most often affected in these patients [7,8]; by contrast, pulmonic valve involvement is rare [9]. However, our patient had vegetations on both the pulmonic and mitral valves, explaining the occurrence of both pulmonary and systemic (brain) emboli. Staphylococcus aureus endocarditis in IDA patients is associated with a high risk of complications, including extra-cardiac deep infections, thomboembolic events and severe sepsis [10].

Neurologic events (which may be sudden and catastrophic) may be the presenting symptom in patients with endocarditis. Embolism is the second most frequent systemic complication of IE (after CHF) and ischemic stroke is the most common embolic manifestation (65%); indeed, stroke is the presenting symptom in 14-19% of all cases of infective endocarditis [11]. Mitral endocarditis is more common that aortic valve endocarditis in patients who present with stroke. Staphylococcus aureus and fungi cause more cerebral embolization, neurologic complications and mortality that other causative agents [11].

A combination of clinical, echocardiographic and laboratory findings leads to the diagnosis of IE. Fever, a new heart murmur and skin or mucosal lesions may be detected in patients with acute, subacute or chronic infective endocarditis; some of the stigmata include conjunctival/mucosal petechiae, Janeway's lesions (non-tender erythematous hemorrhagic lesions on the palms and soles), Osler's nodes (tender subcutaneous nodules of the digits or thenar eminence), petechiae and splinter hemorrhages [12]

Stroke is the leading cause of disability from IE in developed countries; its incidence is 4 per 1000 per year [13] and septic embolization is a rare cause of stroke. All patients with suspected endocarditis should undergo echocardiography to assess their valvular anatomy and left ventricular function [14]; a TEE is especially useful for the detection of vegetations, the diagnosis of prosthetic valve endocarditis, the detection of valve abscess and the assessment of embolic risk. At times, the diagnosis of endocarditis can be challenging, especially if blood cultures are negative; recently, the modified Duke's criteria, which places emphasis the use of TEE, has been proposed in such cases [15].

The cornerstone of management is appropriate antibiotic therapy, governed by culture results; a prolonged course of bactericidal antimicrobials at doses that provide predictable and therapeutic levels should be employed [14]. In adult patients, six weeks of therapy is recommended for complicated right sided IE and all cases of left sided IE; complicated IE is defined as metastatic infection or cardiovascular decompensation (e.g CHF) [15]. A two week course of a semi-synthetic penicillinase-resistant, beta-lactam agent (such as nafcillin), in combination with an aminoglycoside, has been used with some success in the treatment of staphylococcus aureus endocarditis involving the right heart valves; however, the clinical benefit of such combination therapy is marginal to nil and the potential toxicity of adding an aminoglycoside is considerable and proven [14]. Usually, monotherapy for endocarditis caused by methicillin-sensitive strains of staph aureus is adequate [14,16,17].

Valve replacement or repair (especially involving the mitral valve) is now common in the management of selected complications of IE; since valve replacement is associated with a risk of infection of the prosthetic material, valve repair, when technically feasible, is the preferred alternative in the setting of active infection [18, 19, 20]. Recurrent endocarditis is a frequent problem in IV drug abusers and the willingness to proceed with drug rehabilitation should be a prerequisite for undergoing valve surgery [14].

CONCLUSION: Patients with IE may present with systemic or local symptoms and hospitalists should be aware of the complications that might develop from this condition. As our case demonstrates, IE should be always be considered in febrile patients who present with symptoms of stroke, especially in patients with a history of IV drug use.

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HOSPITAL MEDICINE VIRTUAL JOURNAL CLUB

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Abstracts & Full Text Links from recent journals of interest to Hospitalists

http://beckerinfo.net/JClub

FROM THE JOURNALS — Robert Folzenlogen MD

The following articles should be of interest to Hospitalists:

Clinical Practice: Renal Artery Stenosis

Dworkin,, LD & Cooper, CJ, NEJM 2009, 361:1972

Diagnosis and Assessment of Pulmonary Artery Hypertension

Badesch, DB et al., J Am Coll Cardiol 2009, 54:S55

Frequency, Risk Factors and Trends for Venous Thromboembolism among Hospitalized Cancer Patients

Khorana, AA et al., Cancer 2007, 110:2339

Clinical Perspectives of Statin-Induced Rhabdomyolysis

Antons, KA et al., Am J Med 2006, 119:400

Practice Guidelines in Acute Pancreatitis

Banks, PA and Freeman, ML, Am J Gastroenterology 2006, 101:2379

ID CORNER — William Salzer MD

SINUSITIS

A nice article from In the Clinic in the Annals of Internal Medicine on the management of Acute Sinusitis.

Wilson, JF, In the Clinic—Acute Sinusitis, Annals Intern Med 2010, Vol 153, No 5, ICT-3, 9-7-10

http://www.annals.org/content/153/5/ITC3-1.full.pdf+html

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MISSOURI HOSPITALIST CALENDAR

Missouri Chapter ACP Scientific Meeting, Updates in Internal Medicine, Tan Tar A Resort, Osage Beach, September 23-26; Hospitalist Luncheon at 12:15, September 25; contact Patrick Mills 573-636-3366, pmills@msma.org **LOCAL**

Update on Current Management of Aortic Valve Disease, Saturday, October 2, Ritz-Carlton, St. Louis; Washington University Medical Center; register online at: http://cme-online.wustl.edu **LOCAL**

8th Annual Cardiology Update, Saturday, October 2, Memorial Union, University of Missouri, Columbia, register via 573-882-2296 **LOCAL**

Redefining Death in the 21st Century, 6th Annual Health Ethics Conference, University of Missouri Center for Health Ethics, October 7-9, 2010, The Reynolds Alumni Center & Holiday Inn Select Executive Center, Columbia; registration form at som.missouri.edu/CME or call 573-882-5661 **LOCAL**

Annual Update in Cardiovascular Diseases, October 9, Chase Park Plaza, St. Louis, MO Chapter of ACC; register via http://cme.wustl.edu **LOCAL**

Brain Attack! 2010, Comprehensive Stroke Care Door-to-Door, Saturday, October 9, Eric P. Newman Education Center, Washington University Medical Center, St. Louis, register at http://cme-online.wustl.edu **LOCAL**

Please direct all comments, ideas and newsletter contributions to the Editor:

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Please forward this newsletter to Hospitalists that you might know!