Updates in Hospital Medicine

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Abstract

This article delivers concise updates on guidelines for managing lower gastrointestinal bleeding and provides an update on pyuria thresholds for diagnosing urinary tract infections.

UPDATE I: UPDATED GUIDELINES FOR LOWER GI BLEEDING

Lower gastrointestinal bleeding (LGIB) is a common problem encountered by hospitalists. The American College of Gastroenterology updated the guidelines in February 2023, formulating recommendations based on new literature from 2015 to 2021.[1] Those pertinent to hospital medicine are as follows:

Risk stratification

An Oakland score ≤ 8 can be used in addition to clinical judgement to identify low-risk patients with LGIB who are appropriate for early discharge and outpatient follow-up.[2]

Transfusion threshold

This remains unchanged, favoring a restrictive strategy of red blood cell transfusion (threshold for transfusion at a hemoglobin level of 7 g/dL) in hemodynamically stable patients with LGIB in the absence of myocardial injury.

Anticoagulation

In patients on warfarin with a life-threatening LGIB and an international normalized ratio (INR) "substantially exceeding the therapeutic range," reversal is recommended. The panel notes that most patients with LGIB will not require reversal. For patients on warfarin for atrial fibrillation, reversal with 4-factor prothrombin complex concentrate (PCC) is preferred over fresh frozen plasma (FFP) because of the rapidity of INR reduction. Note that PCC products contain heparin, and their use is contraindicated in patients with history of heparin-induced thrombocytopenia. Recommendations regarding indications, amount, and route of vitamin K (phytonadione) administration are varied. In patients on a direct oral anticoagulant (DOAC) that do not respond to initial resuscitation and drug discontinuation, targeted reversal agents should be used if available. The panel recommends resuming anticoagulation after cessation of LGIB as doing so has consistently been shown to decrease the risks of post bleeding thromboembolism and mortality. Resumption within seven days of the bleed is recommended.

Platelets and anti-platelet agents

The platelet count goal in a severe LGIB is recommended to be $>30 \times 10^9$/L. If endoscopic procedures are required a goal of $>50 \times 10^9$/L can be considered. Aspirin for secondary prevention should be continued for patients with LGIB. Non-aspirin antiplatelet agents should be held initially in the setting of a severe LGIB. For patients with cardiac stents within one year, a multidisciplinary management approach should be used. In these patients, P2Y12 receptor antagonists ideally should be resumed within five days to reduce the risk of in-stent thrombosis. Nonsteroidal anti-inflammatory drugs (NSAIDs) and aspirin when used for primary prevention of cardiovascular disease should be discontinued after hospitalization for a diverticular bleed.

Colonoscopy

An inpatient colonoscopy is recommended for most patients with LGIB due to "its value in detecting a source of

bleeding." This may not be needed if the patient's bleeding has subsided, *and* they have had a "high-quality colonoscopy within 12 months with an adequate bowel preparation showing diverticulosis with no colorectal neoplasia." The diagnostic rates for detecting a source of LGIB range from 31-79% with hemostasis rates of up to 21%. Notably, endoscopic hemostasis is not associated with decreased mortality or rebleeding. For patients hospitalized with LGIB requiring a colonoscopy, the panel recommends performing a nonemergent inpatient colonoscopy, as colonoscopy within 24 hours has not been shown to improve clinical outcomes.

Role of Computed Tomography with Angiography (CTA)

CTA is recommended as the initial diagnostic test in patients with ongoing hemodynamically significant LGIB, with a sensitivity and specificity for the diagnosis of LGIB of 90% and 92%, respectively. The study may be falsely negative, however, if the patient is not actively bleeding. CTA can precisely localize the source of arterial and venous bleeding and may help predict the risk of inpatient rebleeding, as 80% of patients with a negative CTA had no further events. Factors that predict a "positive" CTA include older age, hypotension, transfusion of 3+ units of packed red blood cells (PRBC) per day, use of antiplatelet agents/DOACs, recent bowel resection or endoscopic intervention, and imaging within four hours of the LGIB. Patients who have a CTA demonstrating extravasation should be promptly (within 90 minutes) referred to gastroenterologists for endoscopic intervention or vascular interventional radiology for possible coil embolization. Efficacy rates of distal embolization are high (98%), and risks of complications are low (4.6%, most commonly bowel ischemia, ulceration).

Rebleeding

Rebleeding occurs in approximately 13.6% of patients at a median of 3 days after presentation. Risk factors include older age, hypotension, and diverticular bleeding. The cumulative incidence of recurrent diverticular bleed at 1, 2, and 5 years is 4.7%, 8.3%, and 15.7%, respectively, with the median time between first and second episodes of diverticular hemorrhage of 1.2 years.

UPDATE 2: HIGHER PYURIA THRESHOLDS ARE NEEDED FOR DIAGNOSING URINARY TRACT INFECTION (UTI)

Making the distinction between asymptomatic bacteriuria (ASB) and urinary tract infection (UTI) can be challenging. What constitutes clinically significant pyuria may also present a conundrum. This is especially true in older women, where 20% of community-dwelling and 50% of institutionalized have ASB, and over 90% of these patients have concomitant pyuria.[3-5] A commonly accepted cutoff for making the diagnosis of urinary tract infection (UTI) is 10 leukocytes/μL or 5 leukocytes/high-power field (hpf), but this value is derived from studies involving premenopausal women.[4]

The authors aimed to identify the optimal test characteristics of automated microscopy and flow cytometry for diagnosing UTI in older women. The study was conducted in the Netherlands across five hospitals, four long-term care facilities (LTCs), 14 senior housing facilities, and four primary care centers.[5] Women ≥ 65 years were eligible for inclusion. Exclusion criteria included:

- Inability to express symptoms (e.g., due to delirium or cognitive impairment)
- Indwelling urinary catheter
- Immunosuppressive use
- Antimicrobial use (<48 hours prior to inclusion)
- Current urolithiasis
- A UTI in the previous month

To be eligible for the UTI group patients were required to have the following:

- At least two new-onset lower urinary tract symptoms (LUTS) consisting of dysuria, frequency, urgency, or suprapubic pain, *and*
- Pyuria, (10 or more leukocytes/μL or 5 or more leukocytes/hpf or the presence of leukocyte esterase), *and*
- Monoculture (i.e., ≥ 90% of the colonies were of one uropathogen $\geq 10^4$ CFU/mL)

Community-dwelling women and LTC residents who did not have any LUTS or fever were eligible as controls. A midstream or single catheterization urine sample was collected in a sterile container and aliquoted for automated microscopy, flow cytometry, and culture (99% of samples were midstream).

Of the 213 screened participants, 199 were eligible, of whom 164 were included in the primary analysis. Twenty-seven patients presenting with LUTS were not included in the primary analysis because they did not meet the urine culture criteria for the UTI group. The UTI and control groups were not matched, however, both groups were in their late 70s. In the UTI cohort, 22% had diabetes, 91% had a prior UTI, and the most common symptom was increased urinary frequency (91%). Within the UTI group, *E. coli* was the most common causative pathogen (81%). In 78% of UTI episodes, colony counts were ≥ 10^5 CFU/mL. ASB prevalence in the control group was 18%. (It is important to be aware of the units your laboratory uses. To convert from leukocytes/μL to leukocytes/hpf, multiply the number of leukocytes/μL by 0.19[6,7])

Patients with UTI had higher median leukocyte levels compared with controls:

- Automated microscopy: 900 vs 26 leukocytes/μL [$P < .001$]
- Urine flowcytometry: 1575 vs 23 leukocytes/μL [$P < .001$]

Patients with UTI had higher median leukocyte values compared with patients with ASB:

- Automated microscopy: 900 vs 296 leukocytes/μL [$P = .002$]
- Urine flowcytometry: 1575 vs 197 leukocytes/μL [$P = .004$]

At a threshold of 264 leukocytes/μL or 50 leukocytes/hpf, the sensitivity of automated microscopy was 88% (95% CI: 77–94%) and specificity was 88% (95% CI: 80–93%), corresponding to a positive likelihood ratio (LR) of 7.2 and a negative LR of 0.1 for the diagnosis of UTI. For urine flow cytometry, sensitivity was 91% (95% CI: 79–98%) and specificity was 86% (95% CI: 78–92%) at a cutoff value of 231 leukocytes/μL or 44 leukocytes/hpf, with a positive LR of 6.5 and a negative LR of 0.1. For comparison, our currently accepted pyuria cutoff of 10 leukocytes/μL or 5-10 leukocytes/hpf has a sensitivity of 100% and a specificity of only 36%. Incorporating data from similar studies, the authors state that "Higher degrees of pyuria, well above 10 leukocytes/μL, do not necessarily mean that a patient has a UTI."

Take-away: Pyuria and ASB are common in women over the age of 65. While the commonly used cutoff of 10 leukocytes/μL or hpf is 100% sensitive for the diagnosis of UTI, it has low specificity. Instead, we should focus on identifying LUTS, determining our pre-test probability of urinary tract infection, and then consider antibiotic initiation using a higher pyuria threshold of approximately 200 leukocytes/μL or 40 leukocytes/hpf.

Conflicts of Interest/Disclosures

The author has no conflicts of interest to disclose.

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