



1-Minute Pearls/Pitfalls for the Clinician

Kwame Dapaah-Afriyie, MD, MBA, FACP, SFHM, FGCPs^{1,2}

¹ Division of Hospital Medicine, Department of Medicine, Miriam Hospital,

² Department of Medicine, Brown University

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QUESTION 1: WHAT IS THE OPTIMAL MANAGEMENT FOR PATIENTS WITH NEUTROPENIC FEVER?

48-year-old man with history of Acute Myeloid Leukemia who is s/p allogenic bone marrow transplant about 4 years, with course complicated by CMV colitis presents with fevers and fatigue. He denies cough, chest pain, abdominal pain, or diarrhea. No headaches or visual changes. He was recently started on chemotherapy for management of a newly diagnosed Nodular sclerosing Hodgkin's lymphoma. He received his most recent dose of chemotherapy about 10 days prior to his presentation.

Exam: heart rate: 92/min, blood pressure: 126/54mmHg, with respiratory rate of 14/minute. He was febrile with a temperature of 100F. No oral exudates or ulcers noted. Normal cardiac and breath sounds. Abdomen: Not distended. Soft and non-tender. Normoactive bowel sounds. CNS: Awake and alert. Neck-supple. No gross motor deficits noted. Skin: No rashes noted.

Labs: Hemoglobin: 9.8gm%, platelet count: 79,000, with a WBC count of 2.5 and (ANC) Absolute neutrophil count of 300.

Blood cultures are obtained. What are the next steps?

A: In neutropenic patients, infections caused by gram-negative bacteremia have been associated with mortality rates of up to 70%. Early (within an hour of presentation) and appropriate use of empiric antibiotics have shown a reduction of mortality rates to 4% to 20%. Studies have shown an infectious etiology is only identified in 40% to 50% of patients with neutropenic fevers, with about 10% to 30% having bacteremia. Based on historical trends, the most common pathogens seen are Gram-negative Rods: Enterobacteriaceae (including *Escherichia coli*, *Klebsiella* species, and *Enterobacter* species) and *Pseudomonas aeruginosa*. Increasingly infections due to gram-positive

Abstract

This article describes a few pearls/pitfalls pertinent to the management of neutropenic fever in immunocompromised patients and patients with subclinical hyperthyroidism

organisms, such as coagulase negative staphylococci and viridians group streptococci, have been noted.

All patients should be initiated on pseudomonal covering antibiotic such as:

1. Cefepime
2. Carbapenem
3. Piperacillin-Tazobactam (if anaerobic coverage is needed).

In patients who are allergic to beta-lactams, a fluoroquinolone is the preferred option.¹

Does this patient need additional empiric coverage (ie addition of IV Vancomycin) for Gram-positive organisms?

The following indications are for added gram positive coverage according to NCCN Guidelines:

- Hypotension and /or other evidence of severe sepsis
- Skin and soft tissue infections including mucositis.
- Erythema or evidence of infection/inflammation at site of a vascular access
- Persistent fevers after 48 hours of initiating Gram-negative therapy.
- Radiographic evidence of Pneumonia
- MRSA colonization and/or prior infection due to with MRSA
- Positive blood culture due to gram-positive pathogen (before susceptibility results are available)

This patient does not have any of these indications. Patient started on Cefepime. His blood and urine cultures drawn at baseline showed no evidence of bacteremia. He was later discharged to complete a course of antibiotics with Levaquin.

QUESTION 2: HOW DO YOU MANAGE PATIENTS WITH SUBCLINICAL HYPERTHYROIDISM?

52 y/o with a history of osteoporosis, GERD and bronchial asthma which is well-controlled on current bronchodilator regimen is seen in the Emergency department (ED) with palpitations but no fevers, night sweats, weight loss, chest pain, diarrhea, or cough. No history of recent viral illness. In the ED, she is noted to be in SVT and given IV Adenosine resulting in resolution of her symptom. She is not on any medications for osteoporosis due to her intolerance of bisphosphonates. EKG now shows Normal sinus rhythm with normal axis and intervals. No changes consistent with acute ischemia noted. Echocardiogram shows normal Left ventricular function. Her Thyroid function tests reveal normal Free T₄, Normal T₃ and a TSH of 0.05 μ U/mL. Thyroid ultrasound has been ordered. What are the next management steps?

A: This patient likely has Subclinical hyperthyroidism in view of low TSH in the setting of normal Free T₄ levels. One can argue these lab results may fall into category of non-thyroidal illness and therefore these need to be repeated in a few weeks. If subclinical hyperthyroidism is confirmed, one needs to review the indications for treatment of this condition.

Subclinical hyperthyroidism is diagnosed based on persistent suppression of thyroid-stimulating hormone but with normal thyroxine (T₄) and triiodothyronine (T₃) levels. About 0.5% to 7% of patients with subclinical hyperthyroidism progress to overt hyperthyroidism, and 5% to 12% revert to normal thyroid function. Toxic multinodular goiter is a common cause of subclinical hy-

perthyroidism. This condition is associated with an increased risk for atrial fibrillation, cardiovascular events, and hip fracture. Increasing cardiac and musculoskeletal complications are seen in individuals with serum TSH levels $<0.1 \mu$ U/mL (0.1 mU/L). Treatment of subclinical hyperthyroidism is recommended for patients with serum TSH levels $<0.1 \mu$ U/mL (0.1 mU/L) and with symptoms, cardiac risk factors, heart disease, or osteoporosis, as well as for postmenopausal women not taking estrogen therapy or bisphosphonates.

All patients with subclinical hyperthyroidism with symptoms consistent with thyroid gland overactivity need to be treated with anti-thyroid medications. All asymptomatic patients with cardiac risk factors, history of Cardiac disease, and/or osteoporosis require treatment. Post-menopausal women who are not on bisphosphonates or estrogens are also candidates for treatment with methimazole.²

Corresponding Author

Kwame Dapaah-Afryie, MD
Professor of Medicine, Clinical Educator
Warren Alpert Medical School at Brown University
Division Director
Division of Hospital Medicine
The Miriam Hospital, 164 Summit Avenue, Providence,
RI 02906

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