



Rethinking Routine: How Annual CBCs Can Aid in Timely APML Diagnosis



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Introduction:

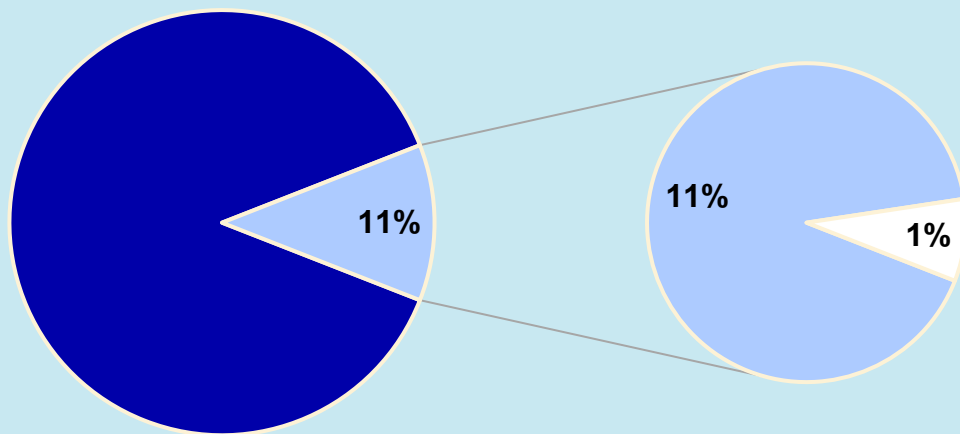
- Acute myeloid leukemia (AML) is a hematologic malignant emergency with increased risk of neutropenic fever, tumor lysis syndrome, and death.
- Pancytopenia is a common initial finding in AML workup detected by routine complete blood count (CBC).
- There are no formal guidelines for ordering annual CBCs to screen for hematologic malignancies, possibly leading to delayed diagnosis and treatment.¹

Current Literature:

Screening Recommendations:

- The American College of Physicians (ACP), American Academic of Family Physicians (AAFP), and the U.S. Preventive Services Task Force (USPSTF) recommend screening for breast, cervical, colon, and lung cancers.
- Annual CBCs aid in detecting hematological malignancies for asymptomatic patients are not recommended given their potential for false positives, unnecessary anxiety, and minimal evidence in detecting serious diseases.^{2,4,5}

Mortality Evidence: Ordering screening CBCs for asymptomatic, non-pregnant adults has not been associated with reduced mortality rates.³

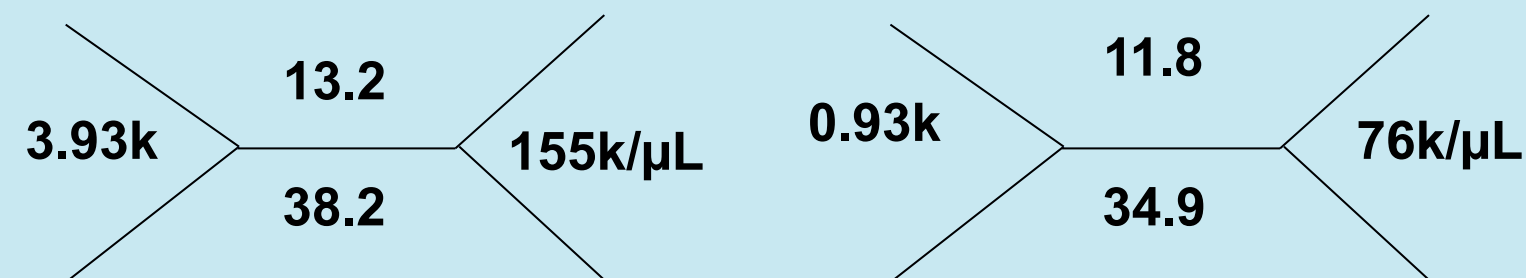


Abnormal CBC Population Percentage:

- 11% of adults have abnormal CBCs.
- Less than 1% of this population will require changes in disease management based off CBC results.

Case Presentation:

- 72-year-old male with a history of hypertension, coronary artery disease, atrial flutter, and Type 2 diabetes mellitus presented to the ED for an episode of acute atrial flutter.
- CBC showed mild leukopenia & normal platelet and hemoglobin counts.
- Following rate therapy, he was converted to normal sinus rhythm and discharged.
- 3 months later, he had an annual physical with the following labs:



CBC at Hospital Discharge (4/25/24)

CBC at PCP Follow-up (7/20/24)

*Prior to the PCP visit, CBC showed pancytopenia, with an absolute neutrophil count of 570 cells and eosinophil count of 12k.

- At the appointment, he reported a two-month history of upper respiratory symptoms, which urgent care previously treated with antihistamines for presumed allergic rhinitis.
- Infectious workup was unrevealing for the cause of pancytopenia.
- He was subsequently empirically treated for a bacterial URI with no clinical improvement.
- He was then urgently referred to hematology, where a bone marrow biopsy revealed myeloid blasts, supportive of AML.
- He was subsequently admitted for initiation of chemotherapy.

Pros & Cons of Annual CBCs:

Pros

- Low cost with insurance coverage.
- Timely acquisition of results.
- Available in clinics with a small and wide range of resources.
- Non-invasive (in comparison to mammograms, colonoscopies, & other cancer screening tools).
- Can detect: AML, ALL, CML, CLL, Hodgkin's/Non-Hodgkin lymphoma, MM, polycythemia vera

Cons

- CBCs are not a standalone diagnostic tool.
- Using CBCs to screen for cancer may reveal benign findings that lead to unnecessary further tests.
- Cannot completely rule out cancer given many solid tumors do not affect CBC parameters.

Patient Updates

- Further genetic workup revealed a t(15;17) translocation, indicative of APML.
- He was started on ATRA. His blood counts continue to be suppressed thought to be secondary to therapy.
- Repeat bone marrow biopsy on July 9/6/24 showed no morphologic evidence of residual leukemia.
 - No increase in blasts & negative for Auer rods

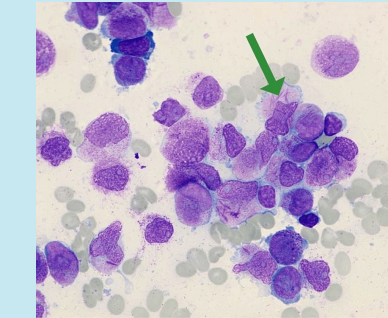
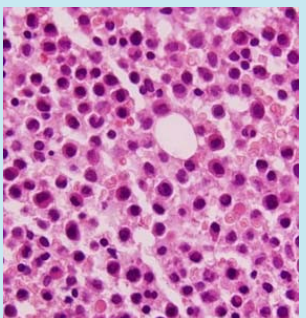


Figure 1.⁶ APML Peripheral Blood Smear with Auer rods (green arrow).
Figure 2.⁷ Hypercellular bone marrow biopsy with sheets of blasts and promyelocytes.



Discussion:

- Our patient was found to have APML after workup was prompted by annual CBC findings.
- The CBC was not ordered for his mild leukopenia just below normal and would likely not have been ordered for a presumed URI. The CBC was instead only ordered because of his annual exam.
- Waiting until the patient was more symptomatic to order hematologic studies would have delayed diagnosis and treatment, worsening prognosis.
- Instead, he received prompt evaluation and treatment following his annual physical.

Conclusion:

This case illustrates that routine CBCs are instrumental in screening for hematologic diseases. Primary care doctors and hematology-oncology providers should consider developing guidelines for annual blood work to enhance early detection of hematologic malignancies like APML.

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