Leukopenia: Trivial or Trouble

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Disclosures

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Objectives

1. Have a working approach to leukopenia
2. Know when leukopenia is a sign of a serious disorder
3. Appreciate when leukopenia requires urgent hematologic consultation
4. Be able to give advice to patients about the risks and management of neutropenia
Normal Leukocytes (~4.5-11.0 x 10^9/L)

- Neutrophils (1.8–5.4) 
  "Polymorphs"/"segmented cells"
- Eosinophils (0-0.4)
- Basophils (0-0.1)
- Lymphocytes (1.3–3.2)
- Monocytes (0.3–0.8)
Normal Leukocytes (~4.5-11.0 x 10^9/L)

- Neutrophils (1.8–5.4)
  + “Bands”
- Eosinophils (0–0.4)
- Basophils (0–0.1)
- Lymphocytes (1.3–3.2)
- Monocytes (0.3–0.8)

Absolute Neutrophil Count (ANC)
Neutrophils - key first responders
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S. Aureus
What do apples have to do with Neutropenia?
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Neutropenia – mechanisms & causes

1. **Decreased Production**
   - External exposures:
     - Drugs, radiation
   - Nutritional (e.g. B12 deficiency)
   - Infiltrative (e.g. leukemia, MDS, solid tumours)
   - Congenital
   - Immune
   - Post-infectious

2. **Shift (“Margination” or “sequestration”)**
   - Constitutional (“benign ethnic”)
   - Splenomegaly

3. **Immune Destruction**
   - Drugs
   - Collagen Vascular/Autoimmune disorders
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Work-Up of NEUTROPENIA

Neutropenia (ANC < 1.8)

Assess severity
- Mild (ANC ≥ 1.0)
- Moderate (0.5 to < 1.0)
- Severe (< 0.5)

ANC < 0.5

History & Physical Exam & Blood film

Febrile?

NO

Other cytopenias?

NO

Self resolves?

Referral to CCMB Hematology

YES

NO

Nutritional deficiency?

NO

Address cause & follow

YES

- Aplastic anemia
- Acute leukemia
- MDS

ANC ≥ 0.5

History & Physical Exam & Blood film

Febrile?

NO

New Onset?

NO

Isolated?

YES

Refrerral to CCMB Hematology

NO

Questions or Doubts?

Address cause & follow (especially if ANC > 1.0)
- Constitutional
- Drug-mediated
- Autoimmune
- Cyclic neutropenia

NO

Validated by: C. Hematology DSG Final (Sfeil)

CancerCare Manitoba
Action Cancer Manitoba

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Advice to the Neutropenic Patient
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1. Mild/moderate chronic neutropenia
   • Report a fever or new constitutional symptoms
   • Alert caregiver team before invasive procedures

2. New onset and/or severe neutropenia
   • Immediate attention for febrile illnesses
   • Specialist consultation (ID and/or Hem) before invasive procedures

3. Sensible diet and handwashing for all risk categories
Take Home Messages: Leukopenia/Neutropenia

• The most important component of leukopenia is neutropenia

• Neutropenia with fever is a medical emergency

• Clinical stability, tempo, presence of other cytopenias determine work-up and management

• Not all patients need specialist hematology review
Questions?

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Ref: Gibson & Berliner.

How we evaluate and treat neutropenia in adults.

Blood 2014 124:1251-1258
Question: In primary care practice, the most common cause of isolated mild leukopenia is:

1. Constitutional neutropenia
2. Severe Aplastic Anemia
3. Systemic chemotherapy
4. Vitamin B12 deficiency
5. Acute Leukemia
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