

Neutropenia

Red Flags

- Neutropenia can be associated with life threatening infection. It is most significant when the total neutrophil count is $< 0.5 \times 10^9/L$.

About neutropenia

- Often discovered as an incidental finding in a routine CBC.
- The normal lower level is influenced by a person's race. The widely accepted lower level of $2 \times 10^9/L$ is appropriate for Caucasians, but levels of $1.5 \times 10^9/L$ or even lower may be normal for African Americans and some Jewish groups.

Causes

- Infections - particularly viral (including HIV), also malaria, typhoid, TB. Acute changes are often noted within 1 to 2 days of infection and may persist for several weeks.
- Drugs - neutropenia with antipsychotic medication has been a significant problem in recent years.
- Autoimmune diseases - SLE, rheumatoid arthritis, anaphylaxis.
- Nutritional - B12 deficiency, folate deficiency, alcohol dependency, anorexia nervosa.
- Splenomegaly.
- Bone marrow pathology e.g., leukaemia, myelodysplasia, aplastic anaemia.

Assessment

History

1. Frequency and severity of infections
2. Mouth ulcers
3. Recent viral illness
4. Exposure to drugs and toxins
5. Symptoms of malabsorption
6. Symptoms suggesting reduced immunity
7. Consider that many drugs can induce neutropenia. Most important are antipsychotics, anticonvulsants, and antithyroid drugs.

Drug-induced neutropenia

- Anti-inflammatory drugs e.g., aminopyrine, phenylbutazone, salazopyrine
- Anti-bacterial drugs e.g, chloramphenicol, co-trimoxazole, sulfasalazine, penicillins
- Anticonvulsants e.g., phenytoin, carbamazepine
- Antithyroids e.g., carbimazole
- Phenothiazines e.g., chlorpromazine, thioridazine
- Psychotropics and antidepressants e.g., clozapine, mianserin, imipramine
- Many others including gold, penicillamine, mepacrine, amodiaquine, ticlopidine, tolbutamide and some herbal remedies
- Cytotoxic agents, including radiation

Examination

- Mouth ulcers
- Fever
- Signs of infection
- Jaundice
- Lymphadenopathy
- Hepatomegaly
- Splenomegaly
- Signs of autoimmune or connective tissue disorders

FBC – look at haemoglobin, platelets, and blood film.

Determine the type of neutropenia for management:

Classification	Neutrophil Count
Mild	1.0 - 2.0 x 10 ⁹ /L
Moderate	0.5 - 1.0 x 10 ⁹ /L
Severe	< 0.5 x 10 ⁹ /L

In persistent, moderate neutropenia without an obvious cause, consider other tests.

Other Tests

- Anti-nuclear antibodies (ANA)
- Rheumatoid factor
- B12
- Folate
- Serum protein electrophoresis (SPE)
- HIV

- Liver enzymes
- Hepatitis B

Management

Neutrophils < 1.0 x 10⁹/L

- Risk of significant bacterial infection increases when neutrophils < 1.0 x 10⁹/L, but more significant if < 0.5 x 10⁹/L.
- If unwell or fever, arrange urgent referral.
- If well and afebrile:
 - advise patient to seek medical attention if they become unwell or febrile.
 - repeat CBC in 48 hours. If neutropenia remains < 1.0 x 10⁹/L, discuss with a haematologist.

Neutrophils 1.0 to 2.0 x 10⁹/L

- Repeat CBC in 1 to 2 weeks.
- If neutropenia persists for > 6 weeks, investigate further
- Only request non-acute haematology assessment (after the other tests are performed) if the neutrophils are persistently below 1.0 x 10⁹/L, or if other significant blood count abnormalities develop.
- If the neutropenia appears stable after a few months and there are no other abnormalities, check every year for two years. After which, no further follow up is required if blood count remains normal and the patient is well.

Drug-induced neutropenia

- If a drug cause is suspected, and if WBC < 3 x 10⁹/L or neutrophils < 1.5 x 10⁹/L, stop the suspected drug.
- Check CBC in one week and advise patient to seek medical attention if they become unwell or febrile.

Request

1. Arrange urgent medical assessment if severe neutropenia and unwell or febrile. However, if the patient is known to the Haematology Department, contact the department directly.
2. Request non-acute haematology assessment if:
 - severe neutropenia.
 - persistent moderate neutropenia.
 - Include copies of all bloods (CBC and blood film) as well as any extra tests that have been arranged.