ANAEMIA AND HIV

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ANAEMIA

• Most common cytopaenia in HIV
  • 95% of patients in the disease course

• Anaemia is NOT a diagnosis

• Multitude of possible causes

• Often multifactorial

.....difficult in the setting of HIV!!

WHAT IS THE SIGNIFICANCE OF ANAEMIA IN HIV?

- Independent predictor of survival prior to HAART

Anaemia and survival in HIV. CID 2003:37
WHAT IS THE SIGNIFICANCE OF ANAEMIA IN HIV?

• Predictor of disease progression

• Impact on quality of life...
APPROACHES TO ANAEMIA

• A morphological approach

• A pathophysiological approach
  • Red cell loss
  • Decreased red cell production
  • Increased red cell destruction
IMPORTANT QUESTIONS:

• Acute or chronic?

• Isolated anaemia – or 2 or more cell lines affected?

• Is it just a blood problem – other systems involved?

Note:

Transfusion does not ‘cure’ anaemia – diagnosing and treating the underlying cause is essential.
Ectopic pregnancy, PV bleeding, think about KS, GIT bleeding, think about KS

Red cell loss

- ↑ red cell destruction
- ↓ red cell production

Ectopic pregnancy
PV bleeding
Haemoptysis
Approach to Anaemia

Red cell loss

↓ red cell production

↑ red cell destruction

Bone marrow problem

Can’t make RBC (Ineffective production)

Bone marrow failure:

- HIV
- Drugs
- Parvovirus B19
- Haematological

Bone marrow infiltration:
An approach to anaemia

Red cell loss

↓ red cell production

↑ red cell destruction

Bone marrow problem

Can’t make RBC

Bone marrow failure:

- HIV
- Drugs
- Parvovirus B19
- Haematological

Bone marrow infiltration:

- TB
- Malignancy
- MAC
- Other OI
An approach to anaemia

- Red cell loss
- ↓ red cell production
- ↑ red cell destruction

Bone marrow problem

Can’t make RBC (ineffective production)

Anaemia of chronic disease
- Can’t utilise Fe
- Cytokines inhibit EPO and haemopoiesis
  - Malignancy
  - Chronic infections
  - Organ failure: renal, liver, endocrine, alcohol

Nutritional deficiency
- Fe
- Folate
- B12
  - Poor diet, ↓ absorption

Lack of EPO: Renal disease
Approach to anaemia

- Red cell loss
  - ↓ red cell production
  - ↑ red cell destruction

Haemolytic anaemia

- Intravascular haemolysis
  - MAHA
  - TTP/HUS
  - DIC – sepsis, malignancy
  - Infections
  - Other

- Extravascular haemolysis:
  - Immune:
    - Autoimmune
    - Drugs: rifampicin, EFZ
  - Inherited:
    - Abnormal membrane
    - Abnormal globin
    - Enzyme defects

Other acquired
Hypersplenism
HIV AND THE BONE MARROW

“in most patients with advanced HIV pancytopenia is the rule”

- The main mechanism for anaemia is a disruption of bone marrow cytokine homeostasis.
  - HIV is cytotoxic to T-helper lymphocytes →leads to dysregulation of B cells / altered release of cytokines.
  - HIV-infected T cells directly suppress growth of bone marrow progenitors, thus suppressing haemopoiesis.
- CD4 is carried by T-helper lymphocytes, monocytes and microvascular endothelial cells (found in marrow).
- The infection of monocytes in the marrow → alters release of cytokines → haemopoietic progenitor cells fail to adequately respond to anaemia and other cytopenias.

DRUGS AND ANAEMIA

AZT:
• Anaemia and neutropaenia
• Macrocytosis (not B12 / folate deficient)
• D4T has same effects, but anaemia less common and less severe

3TC:
• Pure red cell aplasia
• Rare
• Diagnosis of exclusion
• Stop 3TC, give alternative NRTIs
DRUGS AND ANAEMIA

Cotrimoxazole:
• Megaloblastic anaemia (via folate inactivation)
• Neutropaenia
• Thrombocytopenia

Rifampicin:
• Haemolytic anaemia
• Immune thrombocytopenia

Amphotericin B:
• Hypochromic, normocytic anaemia
• Decreased erythropoietin production
PARVOVIRUS B19 INFECTION

• Only one of the Parvovirus group that is a human pathogen

Clinical manifestations:
• Erythema infectiosum – slapped cheek syndrome in children
• Febrile arthropathy in adults
• Nonimmune hydrops fetalis – in utero infection
• Aplastic crises in sickle cell pts
• **Chronic PRCA** in immunodeficient patients; mostly low CD4 counts
PARVOVIRUS B19

- Infects actively replicating erythroid progenitor cells, which are destroyed

Immunocompromised:
- Failure to make neutralising Abs
- Results in persistent viraemia
- And chronic red cell aplasia

Normal host:
- erythroid aplasia transient, no detectable reduction in Hb
PARVOVIRUS B19

Diagnosis:
- **Parvovirus PCR**
- Serology: parvovirus IgM, but may be poor Ab response in HIV pts
- Giant abnormal pronormoblasts on bone marrow biopsy: pathognomonic

Treatment:
- Blood transfusion: may contain neutralising Abs, so cause temporary ↑ in erythropoiesis
- HAART
- IVIG: most pts respond
- If don’t respond – look again for other causes
AUTO-IMMUNE HAEMOLYTIC ANAEMIA

- Rare in HIV
- However: 20-44% of asymptomatic HIV infected patients can be Coombs test +

Why?
- Non-specific binding of antiphospholipid antibodies
- Deposition of immune complexes on erythrocytes
- Coombs test is not a useful investigation in HIV pts
EFFECT OF HAART

![EFFECT OF HAART](CID 2004:38)
HAART IMPROVES ANAEMIA

Johannessen et al. BMC Infectious Diseases 2011 11:190
BLOOD TRANSFUSION

‘Blood transfusion is like marriage: it should not be entered upon lightly, unadvisedly or wantonly, or more often than is absolutely necessary.’

Role of blood transfusion:

• Not a cure for anaemia
• ‘symptomatic anaemia’ – symptoms often due to underlying cause rather than anaemia itself: eg TB in patients with advanced HIV
• Severe respiratory symptoms: aim for Hb of 10
• Otherwise we usually transfuse if Hb < 5.5 g/dL

A review of the use of blood and blood products in HIV-infected patients.
SAJHIVMED June 2012
SUMMARY

✓ Anaemia is not a diagnosis

✓ Look for the cause of the anaemia
  • Is the anaemia acute or chronic?
  • Is the patient bleeding?
  • Look for KS
  • Look for TB, including NTM
  • Exclude and treat other causes; think of malaria
  • Change any implicated drugs
  • Treat Fe/ folate / B12 deficiencies if present

✓ Treat the cause/Remove the offending drug/HAART

✓ Responsible use of blood transfusion
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