AFRICA UNIVERSITY
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"Investing in Africa's Future"

COLLEGE OF HEALTH, AGRICULTURE & NATURAL SCIENCES

DEPARTMENT OF HEALTH SCIENCES

SLS 407 HAEMATOLOGY THEORY

END OF SECOND SEMESTER EXAMINATIONS

APRIL/MAY 2019

LECTURER: DR MABOREKE

DURATION: 3 HOURS

INSTRUCTIONS

Write your candidate number on the space provided on top of each page
Answer **all** questions in sections A on the question paper.
Answer **all** questions in section B on separate answer sheets provided.
Answer any **6** questions in section C on separate answer sheets provided
Credit will be given for logical, systematic and neat presentations in sections B and C

Sections A (40 marks)

Answer all questions by indicating T for TRUE or F for FALSE in front of each of the statements (a) to (d) in all the questions

1. **Which of the following technologies are used by modern Haematology FBC analyses to identify and count blood cells?**
   a) Cytogenetics
   b) Light scatter
   c) Electric impedance
   d Polymerase chain reaction(PCR)

2. **Which of the following methods are used to count platelets?**
   a) Manual using electron microscope
   b) Flow cytometry (Immunologic)
   c) Electric impedance
   d) Light scatter

3. **Red Cell Distribution Width (RDW)**
   a) Is a quantification of degree of poikilocytosis.
   b) Is expressed as co-efficient of variation (CV) or Standard Deviation (SD).
   c) It is usually high in nutritional anaemias.
   d) It is usually normal in thalassaemia trait and anaemia of chronic disease.

4. **Regarding iron deficiency anaemia,**
   a) It is microcytic hyperchropmic
   b) RDW is usually high
   c) Red cell count is usually low
   d) Confirmed by a high serum ferritin

5. **Regarding megaloblastic anaemia,**
    a) Folate deficiency is more common than B12 deficiency in Zimbabwe
    b) Low serum B12 may lead to low red cell folate
    c) Red cells are usually macrocytic and oval
    d) Anisopoikilocytosis is a very usual feature

6. **Regarding thalassaemia trait,**
    a) It is microcytic hypochromic
    b) Red cell count is usually high
    c) RDW is usually normal
    d) Low serum ferritin is diagnostic

7. **Which of the following methods are useful in arriving at an accurate diagnosis ofhaematologic neoplasm?**
    a) Clinical assessment
    b) Morphology
    c) Immunophenotyping
    d) Molecular analysis

8. **Regarding Cytochemistry,**
    a) Sudan Black and myeloperoxidase stain are positive in Acute myeloid leukaemia
    b) Non Specific Esterase stain is positive in monocytic leukaemias
    c) PAS usually shows block positivity in acute lymphoblastic leukaemia (ALL)
    d) Acid phosphatase stains positive for T-ALL

9. **Regarding immunophenotyping for haematologic neoplasms,**
    a) Very useful for characterization of acute leukaemias and chronic lymphoproliferative disorders.
    b) Technique used for liquid samples is flow cytometry
    c) Technique used for solid samples is immunohistochemistry
    d) It is the pattern of antigen expression which makes the diagnosis

10. Regarding normal haemopoiesis,

a) Pluripotent Stem Cell can self-renew and differentiate

b) Haemopoietic cells, stromal cells and extracellular matrix form the bone marrow microenvironment

c) G-CSF is growth factor which promotes differentiation and maturation into neutrophil

d) Precusor of platelets is called a myeloblast

11. Regarding coagulation (clotting) screen,

a) basic initial clotting screen includes PT, aPTT and platelet count.

b) PT assesses the extrinsic pathway Factor V11.

c) INR is derived from PT and is used for monitoring patients on warfarin

d) aPTT is prolonged in deficiencies of intrinsic pathway factors VIII, IX, XI and XII

12. Regarding myeloproliferative neoplasms.

a) They include; Polycythemia Vera (PV), Essential thrombocythaemia (ET), primary myelofibrosis(PM), chronic mycloid leukaemia (CML) and mast cell disease.

b) JAK2 mutation is diagnostic and positive in more than 95% of cases of polycythaemia Vera and about 60% of cases of Essential thrombocythaemia and about 60% of cases of primary myelofibrosis.

c) Platelets on blood film examination show platelet anisocytosis with some giant forms and some hypogranulation.

d) Venous and arterial thrombosis are recognized complications of PV and ET.

13. Neutrophilia can result from which of the following?

a) Infection

b) Tissue damage

c) Bleeding

d) Steroid therapy

14. Regarding Acute Myeloid Leukaemia (AML)

a) Usually presents with anaemia and thrombocytopenia

b) Auer rods in the blasts are diagnostic if present

c) Blasts are positive with Sudan Black (SBB) and myeloperoxidase (MPO) stains

d) Periodic Acid Schiff (PAS) stain is also positive

15. Regarding Acute lymphoblastic Leukaemia (ALL),

a) Commoner in children than adults

b) One of the most curable cancers

c) PAS stain usually shows block positivity

d) Flow cytometric immunophenotyping and cytogenetics are important for confirming diagnosis and prognostication.

16. Chronic Myeloid Leukaemia,

a) Usually shows massive splenomegaly

b) All precursor cells are represented of blood film but predominant cells are mature neutrophils and myelocytes

c) t(9:22) is present in more than 95% of cases

d) PCR for BCR/ABL mutation seen in all.

17. Chronic Lymphocytic Leukaemia,

a) Blood film shows lymphocytosis of small mature lymphocytes and smear cells

b) Median age at presentation is 65

c) Immunophenotyping by flow cytometry is diagnostic

d) Not seen in children and whooping cough in children can mimic it

18. Which of the following are bood film features of infection

a) Increased rouleaux formation

b) Neutrophil right shift

c) Red cell agglutination

d) Neutrophil left shift with some toxic granulation**.**

19. Which of the following are features of Low grade non-Hodgkin's Lymphomas?

a) Insidious (slow) onset

b) Small cells

c) Immunohistochemistry is key to accurate diagnosis

d) Incurable usually

20. **Which of the following are the pillars of Laboratory Quality Assurance (Quality Management System)?**

a) Internal Quality Control activities (IQC)

b) External Quality Assessment (EQA)

c) Continuous Quality improvement

d) Quality blood samples

Section B

Answer all questions in this section.

Each question carries 5 marks.

1. A patient has microcytic hypochronic anaemia and you suspect iron deficiency. List the alternative tests which can be used to confirm iron deficiency.

2. A 40 year old female has macrocytic anaemia. List the possible causes. What further tests do you recommend?

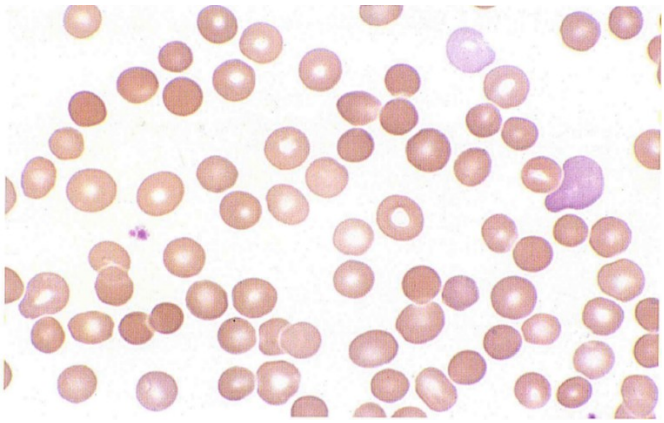
3. List the diagnostic methods used for arriving at accurate diagnosis of haematologic neoplasms.

4. What are the minimum tests for clotting screen in a patient with abnormal bleeding? State what which clotting factors are assessed by each test.

Section C

Answer any six cases on separate answer sheets provided.
Each case carries 10 marks.

Case 1

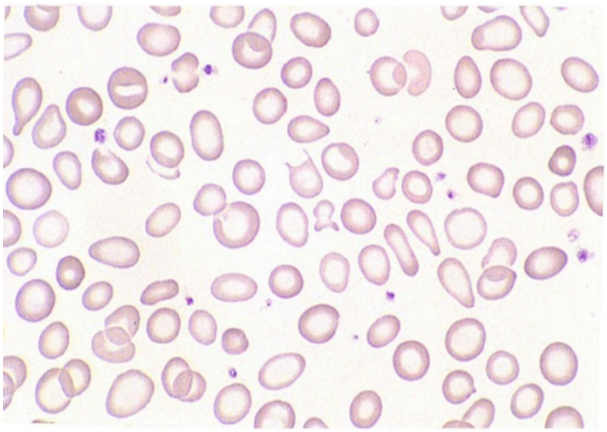


- A 22 Year old female presents with history of galls stones.
- FBC: Hb 13,4 g/dl, MCH 91fL , MCH 34,6 pg, MCHC 37,1 g/dl, RDW-CV 14,8%, WBC 8,4 x10 9/L, Plt. 377 x10 9/L

Questions

a) Comments on this P/s
b) What are your differential diagnoses
c) What further tests do you advise

Case 2

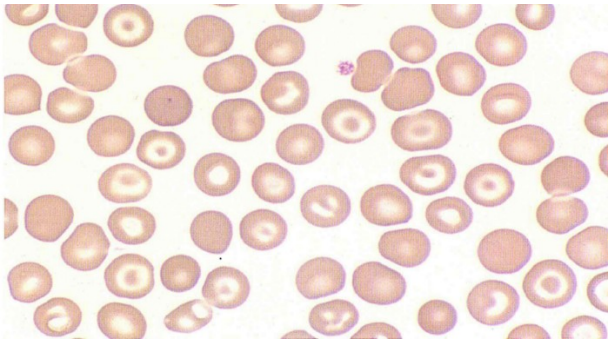


- A 48 year old female with history of menorrhagia due to uterine fibroma.
- FBC: Hb 6,0 RBC 4,32 MCV 58,3 (80 100) MCH 13,9 (28 – 34) MCHC 238 RDW-CV 16,5%, WBC 9,4 Plt 438 . Normal Diff

Questions

a) 1-Comment on red cells, white cells and platelets on the blood film.
b) 2-What are your differential diagnoses?
c) 3-what test/s would you request to confirm diagnosis.

Case 3

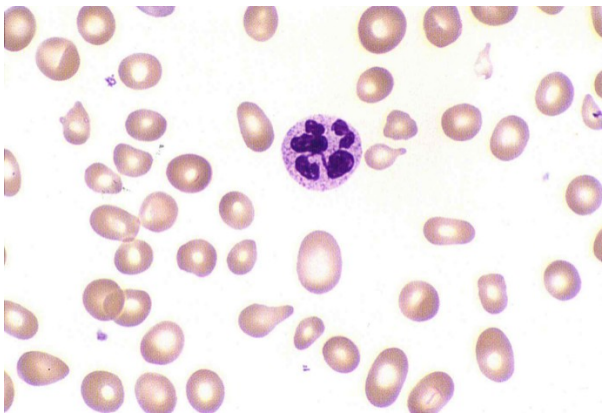


A 45 year old male found collapsed on the flour and 3 bottles of chibuku next to him.
FBC: Hb 15,1 g/dl, MCV 99,8fL, MCH 34,4 pg, MCHC 34,3 g/dl, RDW-CV 15,5 %, WBC 11,1 X10 9/l, Plt 71 x 10 9/L. Normal Diff

Questions

a) Comments on red cells ,white cells and platelets
b) What are the possible causes of the abnormality ?
c) What further laboratory tests do you recommend?

Case 4

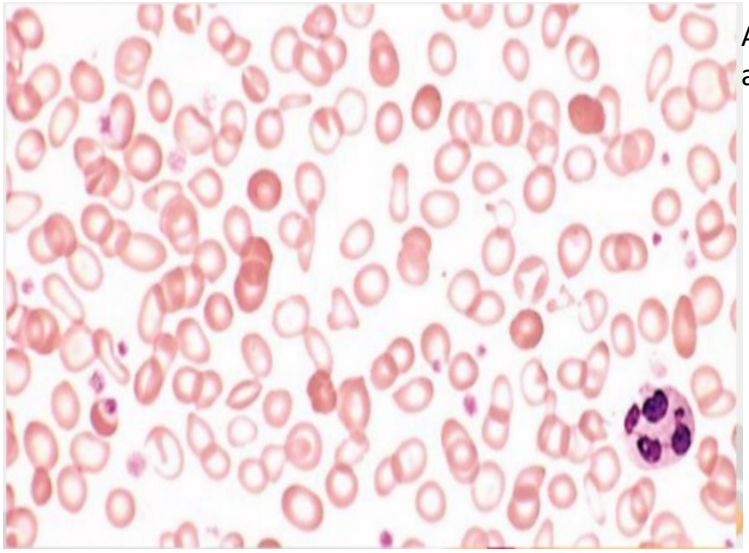


- A 75 year old male living by himself was taken to casualty with shortness of breath.
- FBC: Hb 4,9g/dl, MCV 126,6fL (80 – 100) ,MCH 38,9 pg, RDW-CV 50,7%,WBC 3,2 x 10 9/L, Plt 113x10 9/L. Normal Diff

Questions

a) Comments on red cells, white cells and platelets on this blood film
b) What are your differential diagnoses?
c) What further tests do you recommend to confirm

Case 5

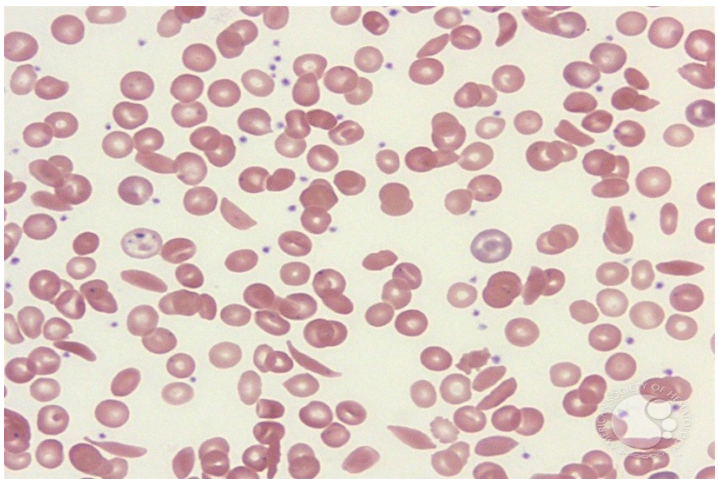


A 25 yr old female has received treatment for anemia.

Questions

a) Report on white cells, red cells and platelets?
b) What is the most likely cause of the anaemia and how do you confirm it ?
c) What is your description of the red cell picture?
d) What are the possible causes of the red cell picture?

Case 6



A ten year old from Murehwa presentswith painfull legs and arms.
WBC 15.3 Neutrophils 8.5 Hb 8.4 Plt 510

Questions

a) Comment on White cells, red cells and platelets ?
b) What do you think is the diagnosis ?
c) What are the two screening tests for this condition ?
d) State the four tests which can be used to confirm the phenotype of this condition

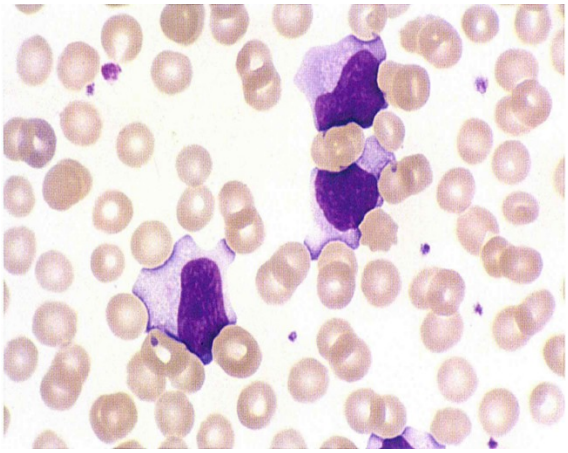
Case 7

A 16 yr old girl with severe sore throat, some enlarged lymph glands in the neck and some tenderness left upper abdomen. She has been dating boys lately.

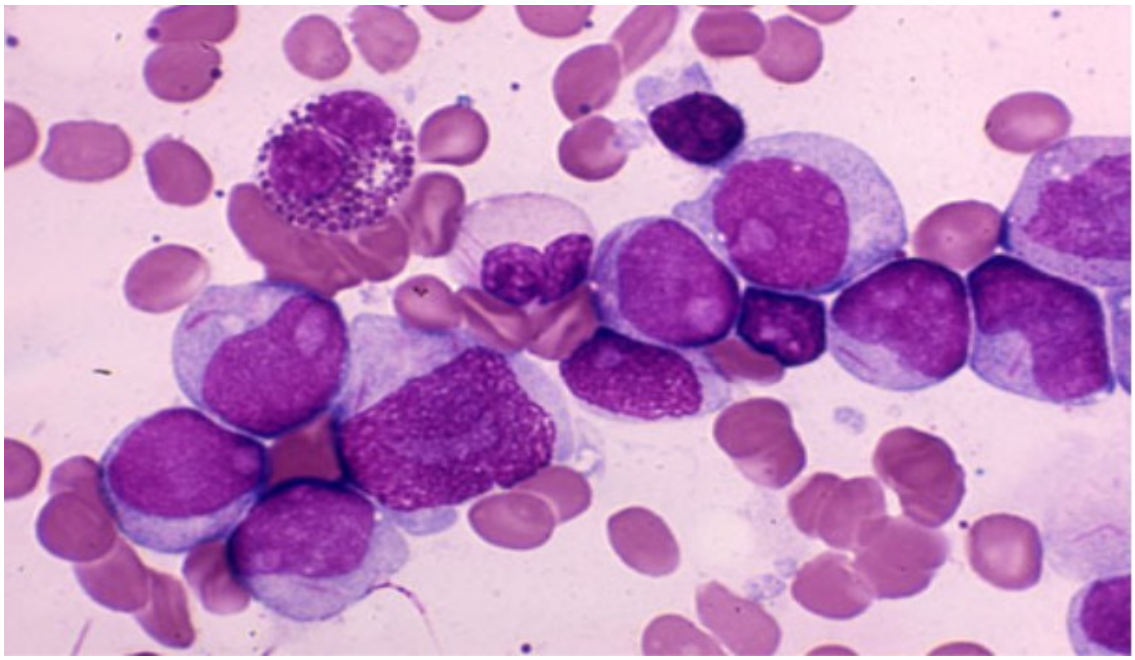
WBC 10 19.3 Neutrophils 5.5 Lymphocytes 12 6 Hb 12.4 PLT 90.

Questions

a) Comments on this bold film.
b) Which viruses can cause this.
c) What further tests can be done confirm the causative virus



Case 8

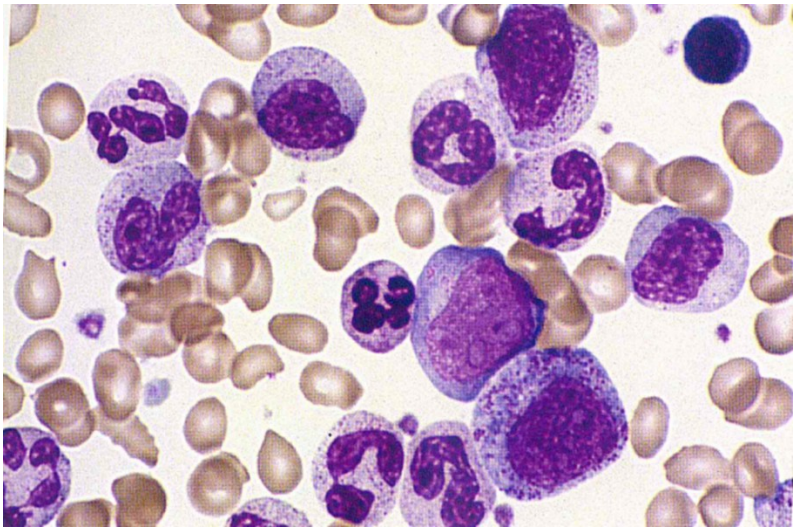


28 yr old man presenting with sore throat, teredness, pallour and bruising and nose bleeds.
WBC 24.4 Hb 6.9 Plt 8

Questions

1) Report on the film.
2) What is the diagnosis?
3) What further tests are required for accurate diagnosis and prognostication ?

Case 9



A 64 year old male presents with lassitude anaemia and splenomegaly.
FBC: Hb 10,4 WBC 170,6, PLT 338, ANC 76,8, ALC 3,4, AMC 5,1,AEC 5,1,ABC 13,6.

Questions

a) Comments on this P/s
b) What is the differential diagnosis?
c) Are further test indicated as part of your final report?