The Royal College of Pathologists
Pathology: the science behind the cure

Part 1 examination

Haematology: First paper

Tuesday 25 September 2018

*Candidates must answer **all** questions. Each question is worth a total of 25 marks.*

Time allowed: 3 hours

1. Haemato-oncology.

A 22 year old woman, presented with a 2 week history of bruising on her arms and legs and a 3 day history of intermittent epistaxis. Examination revealed large bruises of varying ages on her limbs, and a number of oral mucosal haemorrhages. There were no other abnormal findings.
Full blood count shows:

Haemoglobin 96 g/L (NR: 120-160)

White cell count 135 x 10^9/L (NR: 4-10)

Platelets 20 x 10^9/L (NR 140-400)

Blood film showed a large number of abnormal, immature myeloid cells, many with folded nuclei. The cells contained multiple granules and infrequent Auer rods.

Fluorescence in situ hybridisation demonstrated the presence of a PML-RARA rearrangement

Part 1

What is the diagnosis? What immediate additional tests are required? Describe your initial management of this patient. What complications of treatment would you advise the patient about? **(12 marks)**

Part 2

5 days after the start of treatment, the patient complained of increasing breathlessness, and was noted to have gained 5 kg in weight since presentation. Chest XRay showed patchy bilateral opacification. What is the differential diagnosis? How would you manage each possible cause of these findings? **(8 marks)**

Part 3

The patient achieved a complete remission after her initial therapy. 18 months after finishing her initial treatment, there was molecular evidence of relapse. Blood count showed
Hb 112 g/L, white cell count 1.3 x 10^9/L, platelets 60 x 10^9/L.
How would you manage her now? **(5 marks)**

2. Haemostasis and thrombosis

You are asked to see in clinic a 29 year old woman at the request of the obstetric department. She has a history of 3 consecutive first trimester miscarriages and an anatomical cause has been excluded. Investigations have shown a normal haemoglobin, white count and platelet count and PT and fibrinogen, but the APTT is prolonged 15 seconds beyond the upper limit of normal.

a) Discuss in general the differential diagnosis of an isolated prolonged APTT and the history and laboratory investigations you would perform to clarify the cause.
(15 marks)

b) Describe the clinical and laboratory features and the criteria for diagnosis of anti-phospholipid syndrome. **(10 marks)**

3. General Haematology

A 35yr old woman is referred by her GP with a month history of tiredness and easy bruising. Full blood count is as follows

Hb 60 g/L (NR:	120-160)
White Cell Count	2.0 $X10^9$/L (NR: 4-10)
Neutrophil Count	0.03 x 10^9/L (NR: 1.5-7)
Platelets	12 X 10^9/L (NR: 140-400)
Reticulocytes	9 x 10^9/L (NR: 25-85)

The blood film confirms that the counts are genuine. There is no cellular atypia or blast cells in the film. The count is repeated 2 days later and the findings are almost exactly the same. The bone marrow sample shows gross hypocellularity and mild dyserythropoeisis only

Outline your further investigation.
Based on the current criteria state the diagnosis precisely.
Describe the approach to transfusion in this case.
Discuss the management plan for the disorder with justification for choices
(25 marks)

4. Transfusion

What measures are taken by UK blood services to reduce the risk of an adverse transfusion - related event? Explain the rationale for these measures considering all the steps from recruitment of donors through to the dispatch of blood from the transfusion laboratory
(25 marks)

The Royal College of Pathologists
Pathology: the science behind the cure

Part 1 examination

Haematology: First paper

Tuesday 20 March 2018

*Candidates must answer **all** questions. Each question is worth a total of 25 marks.*

Time allowed: 3 hours

Question 1: General Haematology

You are asked by a surgical colleague for your opinion on a 23yr old lady who has been admitted with abdominal pain, but was noted to have Haemoglobin 90g/L, elevated LDH of 600U/L and low haptoglobin.

a) Write a differential diagnosis as a list. Outline your investigation plan with justification for each test that you suggest. (12.5 marks)

b) A diagnosis of Paroxysmal Nocturnal Haemoglobinuria (PNH) is established - outline your management plan of this lady. (12.5 marks)

Question 2: Transfusion Medicine

A 33 year old woman is admitted with symptoms of abdominal pain and confusion.

Full blood count shows Haemoglobin 90g/L, white blood cell count 11 x 10^9/L and platelet count 6 x 10^9/L. Red cell fragments are noted on blood film. Lactate Dehydrogenase (LDH) is > 1200U/L. Blood group is A RhD negative.

A provisional diagnosis of Thrombotic Thrombocytopenic Purpura (TTP) is made and the patient is referred for plasma exchange following placement of central line.

a) Discuss the management of blood product support for this patient. (12.5 marks)
b) Prepare an information leaflet for patients requiring plasma exchange (12.5 marks)

…/questions continue over

Question 3: Haematological Oncology

A 60 year old man presents with drowsiness, nosebleeds, headaches and blurred vision. On examination he has retinal haemorrhages, 4 fingerbreadths of splenomegaly and extensive 1-2 cm lymphadenopathy. Blood count shows Haemoglobin 78 g/L, platelets 76 x10^9/L, and white blood cell count 1.5 x 10^9/L. His serum total protein is elevated, and total IgM is raised at 28 g/L with a paraprotein demonstrated on serum electrophoresis. A bone marrow trephine biopsy reveals dense infiltration with lymphoplasmacytoid lymphocytes.

a) What is the diagnosis? What further investigations are required to identify the cause of his presenting symptoms and clarify the underlying problem? Indicate the appropriate initial management of the patient (7 marks)

b) With appropriate initial management, his symptoms improve significantly. What options for systemic anti-cancer treatment would you offer him to treat the underlying condition? Describe what aims of treatment and potential adverse effects you would discuss with the patient in order to gain written informed consent for the proposed treatment (9 marks)

c) He responds well to first line chemotherapy and achieves a remission. 12 months later he represents with renewed nosebleeds and a significant rise in the IgM paraprotein. What is the appropriate management at this stage? Are there any molecular genetic tests that might guide your choice of therapy? (9 marks)

Question 4: Haemostasis and Thrombosis

You are asked for advice on a 70 year old woman with a platelet count of 45 x 10^9/L who had undergone coronary artery bypass graft surgery 6 days previously. Full blood count and coagulation screen (prothrombin time and activated partial thromboplastin time) are otherwise normal. The blood film confirms the thrombocytopenia is genuine with no other abnormalities seen and review indicates that the preoperative platelet count was normal.

a) Discuss the differential diagnosis and any further history you will obtain to help establish the diagnosis (7 marks)

b) Outline the pathophysiological basis of heparin induced thrombocytopenia (HIT). Discuss the laboratory tests used to investigate suspected cases of HIT and how the findings of these may be interpreted in its diagnosis (12 marks)

c) Outline the anticoagulation options available for the treatment of HIT including the duration of treatment and describe any factors that may influence your choice of treatment. (6 marks)

The Royal College of Pathologists

Pathology: the science behind the cure

Haematology

First Paper

Tuesday 26th September 2017

Candidates must answer ALL questions

Time allowed: 3 hours

Question 1: Haemostasis and thrombosis

A 28 year old woman presents for the first time to antenatal clinic at approximately 34 weeks gestation. Her haemoglobin, white cell count, and differential are normal but platelet count is 58 x 10^9/l. The blood film confirms genuine thrombocytopenia. You are asked to see her by the obstetrics team.

a) Detail the history, examination and investigation you would perform to establish the differential diagnosis.
b) Outline the differential diagnosis in an otherwise completely well patient
c) Outline the management of the mother and baby for a diagnosis in this case of ITP

Question 2: Haemato-oncology

A 64 year old man describes 6 months of fatigue, loss of appetite, sweating and weight loss. On examination he has 3 finger breadths of splenomegaly and palpable liver edge.

His FBC is: Haemoglobin 110 g/L, white cell count 20 X 10^9/L (neutrophils 15.3 basophils 0.3), platelets 110 x 10^9/L. Blood film examination reveals a leucoerythroblastic picture with numerous tear drop poikilocytes. Blasts account for <1% of circulating white blood cells and there are giant platelets.

a) What is the most likely diagnosis and the differential diagnosis? Outline the investigations you would perform and the results you would expect to confirm the diagnosis.
b) Outline the natural history of this condition, and how you would predict the clinical course in this patient.
c) Discuss the management options for this patient.
d) Summarise in short note form the information you would wish to convey to this patient during your consultation.

Question 3: Transfusion medicine

A blood sample sent to the hospital blood bank for crossmatching is found to have a positive direct antiglobulin test (DAT).

What are the possible causes of the positive DAT, what further features in the history and laboratory investigations would be appropriate and how would you manage the provision of red cell support?

Question 4: General Haematology

A GP seeks advice on a 23 year old patient with (haemoglobin) Hb SS, estimated 10 weeks pregnant. She is para 0 + 0.

She wants to know if she is going to have an affected child & what antenatal care she should have.

a) Outline the detail of the investigations that you would recommend the GP to send to the laboratory prior to the patient being seen in 1 weeks time in clinic

b) List the relevant tests for her partner and the rationale for these

c) Draw up an outline of how you would approach care in pregnancy with reference to potential complications

The Royal College of Pathologists
Pathology: the science behind the cure

Part 1 examination

Haematology: First paper

Tuesday 21 March 2017

Candidates must answer ALL QUESTIONS

Time allowed: Three hours

Question 1: Haemostasis and thrombosis

You are asked to see a 35 year old female in clinic who requires tonsillectomy. She has been referred from pre-op assessment clinic having reported “bleeding” following a previous dental extraction.

Discuss features of the clinical history and examination that would be relevant. Which investigations you would subsequently request – please explain why you would perform these investigations and any caveats in the interpretation of results.

Question 2: Transfusion

Describe the strategies used to keep the blood supply free from potential viral infections, using 2 example viruses (include one virus recognised as an issue in the past 3 years) to illustrate your answer. What practices, other than strategies to minimise the risk of viral contamination of a product, maximise clinical safe and effective blood transfusion for patients?

Question 3: Haemato-oncology

A 26 year old lady presents to her General Practitioner with a 4 month history of worsening wheeze, associated with lumbar back pain, drenching night sweats and 6 kg weight loss. Her full blood count is as follows: Haemoglobin 102 g/L (MCV 69) platelets 470, white cell count 16 (neutrophils 11.9, lymphocytes 0.3, eosinophils 2.0). She has a 3cm left axillary lymph node palpable and 2 fb splenomegaly palpable below the costal margin. A CXR reveals a wide mediastinum and pulmonary infiltrates. Biopsy of the axillary node reveals a nodular appearance with extensive bands of fibrosis. There are scattered large cells that are CD 15 and 30+ve and are –ve for CD 20 and 45. There is positive staining for LMP-1. There is a background scattered positivity for both B and T cell markers.

Discuss the diagnosis based on these results.

Outline your management plan, including further investigations and choice of treatment.

Describe what you would tell the patient and her family at the first consultation.

Question 4: General Haematology

a) A 50 year old man is referred with a ferritin of 800mcg/L. Outline your evaluation of this patient to include a clear relevant clinical history and description of investigations to clarify your diagnosis.

b) Write an outline for a nurse led haemochromatosis clinic of patients with an established diagnosis including procedure, monitoring parameters, referral criteria for medical review & key performance indicators.

The Royal College of Pathologists
Pathology: the science behind the cure

Part 1 examination
Haematology: First paper
Tuesday 20 September 2016

Candidates must answer ALL questions

Time allowed: Three hours

Question 1: Haem-Oncology

A 70 year old presents to the new patient clinic with a 6 month history of lymphadenopathy in neck and groins. He complains of increasing tiredness and weight loss of 6 kg in the last three months. He had was admitted to hospital 2 weeks ago with pneumonia which is when a raised white cell count was first noticed. The investigations below have been performed. The patient has come to clinic today for the results of the investigations and a treatment plan.

Investigations:

- Hb 98g/L, White cell count $94x10^9$/l, platelets $85x10^9$/L, neutrophils $1.4x10^9$/L
- Flow cytometry markers (Positive defined by > 30% of cells positive): CD5 pos, CD 19 pos, CD20 pos, CD22 pos, CD23 pos, CD43 pos, CD11c weak pos, CD 10 neg, FMC7 neg CD 79b neg
- CT scan: widespread lymphadenopathy with nodes both above and below diaphragm, no compromise of other organs currently, largest nodal group 6 x 4.2cm in the para-aortic region
- Cytogenetics are outstanding.

Discuss the diagnosis based on the information given.

Discuss how prognostic features including the cytogenetics and molecular analysis and patient specific factors such as co-morbidities would impact on therapeutic recommendations?

Question 2: General Haematology
Outline the principles of the common laboratory tests used to investigate suspected B12 and folate deficiency.
Prepare a guideline for GPs to make best use of these tests to include:

- Definite indications for testing
- Target groups for screening
- Issues for interpretation of the test results
- Treatment of B12 deficiency

Question 3: Transfusion medicine

A 32 year old woman with sickle cell disease is found at antenatal screening to be Group O R_0 r with anti-U present.

What are the possible transfusion-related complications which might arise during this pregnancy and post delivery, and how should they be managed?

Question 4: Haemostasis and Thrombosis

A 58 year old man was admitted to the medical assessment unit 8 hours previously with signs and symptoms of pulmonary embolism, confirmed on CT pulmonary angiogram (CTPA). He has been commenced on therapeutic dose low molecular weight heparin. This is his first episode of venous thromboembolism (VTE). You are asked to review him and advise on his subsequent management.

Comment on options for anticoagulation
Comment on appropriate further investigations

Set out your advice and the reasons for your opinion.

The Royal College of Pathologists
Pathology: the science behind the cure

Part 1 examination
Haematology: First paper
Tuesday 22 March 2016

Candidates must answer ALL questions

Time allowed: Three hours

Question 1: General Haematology

A 16 year old non-European is referred for review in the haematology clinic with a history of 'thalassaemia' treated abroad with blood transfusions. Her Hb is 65g/L and her spleen is measured at 5cm below the costal margin

a) Describe how you would assess her and the appropriate investigations that you would initiate in your first clinic.

b) Outline what relevant review and tests would be needed to achieve a full annual review of her thalassaemia

Question 2: Transfusion medicine

What are the indications for transfusion of fresh frozen plasma and what evidence is there to support the use of this component? What are the potential adverse effects associated with FFP and how can they be prevented?

Question 3: Haemostasis and Thrombosis

You are asked to review a 28 year old female patient who is scheduled to undergo nasal polypectomy. You are informed that there is a history of von Willebrand disease in her family and she shows you a registration card from when she was 6 years old on which a VWF antigen level of 0.42 iu/ml is documented.

a) Explain what you would do to review the diagnosis and the laboratory investigations you would perform.

b) Discuss how the findings from question a) may affect how you advise on this patient's management.

Question 4: Haematological Oncology

A 29 year old man presents with general lethargy and petechial rash. He has no previous medical history.

His FBC shows Hb 61g/L, MCV 103 fL, WCC 0.9 x 10^9/L, Neutrophils 0.4 x 10^9/L, Platelets 11 x 10^9/L, Reticulocyte count 18 x 10^9/L.

The film shows round macrocytes, normal morphology otherwise and confirms genuine thrombocytopenia.

The bone marrow trephine reveals a profoundly hypocellular marrow with no significant dysplasia or blast cell infiltrate.

a) Discuss any further investigations that are indicated into the diagnosis.

b) Discuss the diagnosis and severity.

c) Discuss the provision of blood product support for this patient.

d) Discuss the treatment options for this patient.