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PTM 4210 (Pathology) : Paper 2

END OF YEAR EXAMINATION

Date: 3rd October, 2018

Time : 14:00 -17:00 hours

INSTRUCTIONS

1. There are 3 sections in this paper:

Section A: Attempt 3 questions from 4.

Section B: Attempt 3 from 4 questions.

Section C: From the 5 questions, Attempt 4.

The total number of questions from the 3 sections is 13, from which you are required to attempt **10 only**.

2. **Do not** turn this page until instructed by the invigilator.

3. Write your **computer number** on every answer script.

SECTION A: Choose 3 questions from the 4 below (35 marks)

1. A 15 year old boy is admitted in a comatose state. His mother stated that he had complained of excessive thirst from about a week previously. She thought he had lost weight over the past few weeks. On the day of admission, he had vomited repeatedly and become drowsy.

- One examination: Comatose, with deep and rapid breathing. Breath smelled of acetone. Signs of dehydration were present: loss of skin turgor, dry mouth, sunken eyes. Pulse 110, BP 90/50.
 - Dip-stick test on urine showed glucose 3+, ketones 4+, pH 5. *3+ 7.3 urine high*
 - Plasma: Na⁺ 130 (135-145 mM), K⁺ 5.8 (3.5-5.5 mM), Cl⁻ 100 (97-107 mM), Urea 18mmol/L, Creatinine 140 (75-115 μM), Glucose 32 mmol/l, pH 7.05, pCO₂ 2.0 (5.1-5.6) kPa, HCO₃⁻ 5 (22-28)mmol/l
- What type of acid-base disturbance is present?
 - Calculate the anion gap. Comment on its value.
 - What treatment is appropriate?
 - Which biochemical parameters should be frequently monitored during treatment?
 - The HCO₃⁻ is low. Should it be corrected with NaHCO₃ Rx?
 - What type of diabetes is likely here?

LHF

✓ 2. Mr Eddie a 77-year-old man presents to the ED with worsening dyspnoea on exertion, PND, and oedema over the last week. He has a history of coronary artery disease with a prior MI at the age of 70. He is a known diabetic and hypertensive patient who developed heart failure 3 years ago but has done well since then with stable NYHA class II symptoms and BMI of 28 (previous BMI 37). He has been free of angina, palpitations, or syncope. He has a history of alcoholism and cigarette smoking. He follows a low salt diet and is compliant with medications. He denies fever, chills, sweats, or productive cough. His weight has increased by 1.2 kg in the past week. His past medical history is significant for hyperlipidaemia, chronic obstructive lung disease, and mild renal insufficiency. Examination also revealed a raised JVP, splenomegaly and hepatomegaly

- What modifiable risk factors of heart failure did/does Mr Eddie have.
- What clinical features are suggestive of a failing left heart pump.
- On examination of Mr Eddie's lungs what will you most likely hear.
- What is the most likely explanation of Mr Eddie's recent weight gain in the past week.
- What do the abbreviations JVP stand for?
- List the investigations you would order for Mr Eddie according to the table below.

	TEST			
BLOOD	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
RADIOLOGICAL				

- ✓ 3. Question 3
- A woman and her husband had gone for a medical investigation for they were unable to have a baby for the past two years. Investigations revealed that the woman had primary ovarian failure. Briefly explain the biochemical tests used to investigate female infertility and the likely picture of the results in her case. (5 marks)
 - What is the couple's principal option to achieve a pregnancy? (1 marks) *Surrogate*
 - Write short notes on the biochemical alterations in pregnancy (5 Marks)
 - Write short notes on the different types of male hypogonadism (4 marks)

✓ 4. Briefly outline the complications of liver cirrhosis and state the biochemical tests used to monitor its outcome.

ALP

SECTION B: Choose 3 questions from the 4 below (30 marks)

Breast Cancer

1. A 25-year-old female presents with fever, easy fatiguability and menorrhagia. She had completed a cycle of radiotherapy 2 weeks earlier for breast cancer. A full blood count (FBC) shows Hb 4.5g/dL (13-18g/dL), MCV 94fL (84-100fL), platelets $18 \times 10^9/L$ ($140-440 \times 10^9/L$) and WBC count of $1.9 \times 10^9/L$ ($3.6-11.2 \times 10^9/L$). Bone marrow biopsy shows cellularity of 15% (45-75%) with no evidence of malignancy.

- What is your provisional diagnosis?
- Could it be hereditary or acquired?
- What is the contributing factor in this case?
- Based on your answer in (iii), can this situation be reversed?
- Give one possible explanation for the fever

2. A 69-year old previously healthy female has been feeling increasingly tired and weak for several months. She is found to be anaemic with a haemoglobin of 8g/dl (12-17g/dl). She has a history of peptic ulcer disease with occasional haematemesis and melaena. The MCV is 65 (84-100) and the MCH is 19 (25-35). The peripheral smear shows small, pale erythrocytes with occasional pencil cells, elliptocytes, tear drop and target cells.

- How would you classify the anaemia that this patient has? ✓
- What is the underlying cause in this patient?
- What parameters have you used to come up with this conclusion?
- What is the differential diagnosis for this type of anaemia?
- How would you confirm the diagnosis?

3. A 69-year-old woman complains of back pain. A radiograph reveals a partial collapse of T11, along with several 0.5- to 1.5-cm lytic lesions. A bone marrow biopsy is performed and a smear of the aspirate shows mostly plasma cells.

- What other laboratory tests would you perform in view of the above findings?
- What test would confirm clonality of these plasma cells?
- What is your diagnosis?
- What are some of the complications of this condition? Give two (2)
- What are some of the treatment options for this condition?

4. A 54-year-old female presents with the sudden onset of headaches with photophobia worsening for the past 2 days. She has a temperature of $37^\circ C$. A full blood count (FBC) shows the following: Hb 11.2g/dl, ↓ haematocrit 0.34, MCV 94fL, platelet ↓ count of $32 \times 10^9/L$ and WCC of $9.9 \times 10^9/L$. The peripheral blood smear demonstrates schistocytes. Her urea and creatinine levels are markedly raised.

- What is your diagnosis?
- What is the underlying disorder in this condition?
- Are there any further tests that can be performed as baseline and to add value for diagnosis?
- What are your treatment options?
- Would this condition be considered a haematological emergency? Why/why not?

SECTION C: Choose 4 questions from the 5 below (40 marks)

- ✓ ① List modifiable and non-modifiable risk factors for atherosclerosis and briefly explain each.
- ② Define hypersensitivity and briefly discuss the types of hypersensitivity.
- ✓ ③ A 34 year old woman is recently diagnosed with breast cancer
 - A. What are the risk factors of breast cancer (3 marks)
 - B. Clinical presentation of breast cancer (3 marks)
 - C. What is the approach in investigating a breast lump? (4 marks)
- ④ Peptic ulcers are chronic, most often solitary lesions that occur in any portion of the GIT exposed to aggressive action of acidic peptic juices.
 - A. Define an ulcer (2 marks)
 - B. Mention two (2) sites where peptic ulcers commonly occur in the GIT (2 marks)
 - C. Give two (2) conditions important for peptic ulcer development (2 marks)
 - D. List the complications of peptic ulcers (4 marks)
5. Write short notes on the pathogenesis of cervical cancer

QUESTION 1

(a) Metabolic Acidosis with Partial Respiratory Compensation

$$\begin{aligned} \text{b) Anion Gap} &= (\text{Na}^+ + \text{K}^+) - (\text{Cl}^- + \text{HCO}_3^-) \\ &= (130 + 5.8) - (100 + 5) \\ &= 135.8 - 105 \\ &= \underline{\underline{30.8}} \end{aligned}$$

Interpretation:

c). Potassium

- Fluid Replacement Therapy
- Insulin

D). Potassium levels - Every 4 hr.

- Other electrolyte levels
- Glucose levels Blood every 2 hrs.
- Blood gases

e) = No

Because it will regenerate with ketone anion metabolism

f) Diabetes Mellitus Type 2

QUESTION 2

a) Hyperlipidemia

- Diabetes
- Hypertension
- Obesity
- Alcoholism
- Smoking

b) - Dyspnea
- P.A.B.

c) Fine Crackles = Auscultation
- Dull Percussion note = Percussion.

d) Fluid Retention

e) Jugular Venous Pressure

f) Blood

- Troponine T & I
- Creatine Kinase, MB
- A-UP
- B-UP
- C Reactive Protein

Radia

- Angiogram
- X-Rays

- Echocardiogram
- Nuclear Medicine Scans
- Cardiac MRI

SECTION B

QUESTION 2

(a) Microcytic hypochromic

(b) Chronic blood loss from peptic ulcer

(c) Hematemesis + Melena

- Weakness

- ↑ Tiredness

(d) Iron deficiency anemia.

(e) Serum Iron.

= Total Iron Binding Capacity.

- Serum Ferritin.

Question 3

(a)

b)