THE HONG KONG COLLEGE OF ANAESTHESIOLOGISTS

FINAL FELLOWSHIP EXAMINATION (INTENSIVE CARE) LONG ANSWER PAPER

2 Questions

Monday 25 July 2022 (1:00 pm - 3:00 pm)

NOTICE

(A) Write your answers to the two questions in separate books.

(B) Read the questions carefully, and in view of the time available, balance your answers to encompass points of great importance without going into needless detail.

(C) Record your number on the cover of each book and hand in all books.

(D) Use ink or ball-point pen.

QUESTION 1

A 59-year-old male plumber was admitted to the medical ward 5 days ago with epigastric pain and dark color urine. He was found to have jaundice, spider naevi and hepatomegaly on examination.

He is a chronic smoker and used to be a heavy alcohol drinker but stopped 1year ago.

Past medical history
Diabetes Mellitus
Hypertension
Ischemic heart disease - stent to left circumflex artery 12 years ago

He is on aspirin 100mg daily, metoprolol 50mg daily, amlodipine 10mg daily, simvastatin 20mg note, metformin 750mg BD

Investigations on admission:

Investigation	**Patient value**	**Reference range**
White Cell Count((WCC)	10.9 x 10^9/L	4 -11
Haemoglobin (Hb)	**13.9 g/dL**	14 -18
Platelet	162 x 10^9	150 - 400
Prothrombin time(PT)	**13 seconds***	9.1-12.1
International Normalized Ratio (INR)	**1.27***	0.8-1.2
Na	**134 mmol/L***	136 - 145
K	4.4 mmol/L	3.5 - 5.1
Urea	4.22 mmol/L	2.76 - 8.07
Creatinine	73µmol/L	59 - 104
Albumin	**29 g/L***	35 - 52
Total bilirubin	**121 µmol/L***	0 - 21
Direct bilirubin	**106 µmol/L***	0 – 5
ALT (SGPT)	**63 U/L***	0 - 41
AST (SGOT)	**80 U/L***	5 - 40
Gamma glutamyl transferase (GGT)	**470 U/L***	8 - 61
Alkaline phosphotase	**296 U/L***	40 -129
Amylase	74 U/L	28 - 100
Alpha Feto Protein(AFP)	**38.9 ng/mL***	</= 7
Carcino Embryonic antigen (CEA)	19.3 ng/mL	0 - 4.6
CA 19.9	<0.6 U/mL	0 - 27
Prostate Specific Antigen (PSA)	0.291ng/mL	0 - 4

*** Values out of normal range**

CT whole body report summary - liver cirrhosis, 3 lesions in liver, enlarged porta hepatis lymph node, multiple para aortic and para caval lymph nodes, emphysema lungs, bilateral lung nodules and mediastinal lymph nodes suspicious of lung metastasis.

Radiologist's impression is liver cirrhosis, suspicious of multi centric hepatocellular carcinoma, enlarged lymph node most likely metastatic.

He was referred to the oncologist and proceeded for biopsy of liver lesion.
Patient complained of increasing abdominal pain 2 hours post liver biopsy and an urgent CT abdomen and pelvis was performed.

ICU doctor received an urgent consultation from the CT room.

Initital assessment by ICU doctor as below.
Semi conscious GCS 8/15 (E1V2M5)
Gasping
Systolic BP 70mmHg, sinus tachycardia

CT verbal report: Peri-hepatic hematoma 3cm thick, presence of free fluid in abdomen and pelvis

Question A

Outline the emergency management of this patient (20 marks)

Question B

Tabulate operative vs non-operative management for bleeding post liver biopsy. Focus on the management strategies involved, the indications, pros and cons for either treatment modality. (20marks)

The patient underwent an emergency laparotomy. During surgery 4.5L of blood and clots were evacuated from the peritoneal cavity. Oozing was noted from biopsy site which was a large tumour at segment VI/VII. Surgeons were unable to achieve hemostasis with diathermy/surgicel. Liver packing was done and abdomen was closed. He was transfused with 10U of packed cells, 8U of FFP and 8U of platelets during the surgery. Plan for re-laparotomy and pack removal after 24 hours.
Patient is transferred back to ICU.

Question C

a) **Define massive blood transfusion** **(2 marks)**
b) **What are the potential complications of massive blood transfusion?** **(8 marks)**

Patient condition in ICU

- Escalating doses of vasopressors required to maintain mean arterial pressure despite fluids.
- High ventilating pressures.
- FiO_2 0.9
- Anuric.
- Abdomen tense and distended.

- ABG: pH 7.16, pCO_2 45 mmHg, pO_2 91 mmHg, lactate 14.9 mmol/L, HCO_3 16, BE -12

Question D

a) **Define abdominal compartment syndrome.** **(2 mark)**

b) **How do you measure intra-abdominal pressure? Briefly describe a method** **(4 marks)**

c) **Intra-abdominal pressure (IAP) for this patient is 20mmHg. Does he have abdominal compartment syndrome? Justify your answer.** **(10 marks)**

d) **How will you manage this patient before the surgeon takes the patient back to the operating theatre next morning?** **(14 marks)**

The patient went back to operating theatre for re-laparotomy, removal of packs, ligation of right hepatic artery. Postoperatively, he developed acute liver failure with worsening coagulopathy, recurrent hypoglycaemia, encephalopathy and fixed dilated pupils. Hemodynamic status was unstable with escalating inotropes and worsening metabolic/lactate acidosis. He remained anuric.

The patient's family wishes to continue aggressive organ support, blood and blood products transfusion and cardiopulmonary resuscitation (CPR) in the event of cardiac arrest.

Question E

a) **Do you agree with the family's request? Explain.** **(5 marks)**

b) **Discuss the end-of-life management for this patient along the 4 ethical principles. (15 marks)**

QUESTION 2

A healthy 29-year-old primigravida was admitted to labour ward at 30 weeks of gestation of twin pregnancy complaining of a severe headache and blurred vision. Her blood pressure (BP) was 200/120 mmHg with 2+ proteinuria on urinalysis. Repeat BP a few hours later was 180/110 mmHg. Laboratory studies showed a normal hematocrit, low platelet count (65 x 10^9/L), and increase in liver transaminase levels (1.5 x upper limits).

She developed a seizure lasting one minute in the labour ward. You are the ICU consultant and decided to admit her to ICU for further care.

Question A

The patient fully regained consciousness of Glasgow Coma Scale (GCS) 15/15, SpO2 96% on room air, respiratory rate of 12/min, heart rate of 90/min, blood pressure of 180/110mmHg.

a) What are pathophysiological mechanisms for her condition? (5 marks)
b) Outline your management for this patient. (25 marks)

Question B

Twenty four hours after stabilization she underwent caesarean section by spinal anesthesia with intra-operative blood loss of 550ml. Her twin babies were admitted to the neonatal ICU. Her BP was stable 120/65 on treatment. Twelve hours later, you were informed she had fresh bloody vaginal discharge > 800ml.

a) What are possible causes for her vaginal bleeding? (5 marks)
b) List the risk factors for postpartum heamorrhage (PPH). (5 marks)
c) Outline the principles of management of PPH. Details of initial resuscitation are not needed. (15 marks)

Question C

She was stable after your management and discharged from hospital.

One month later, she was readmitted for shortness of breath since last 2 to 3 days.

On examination, she was afebrile, orthopnoeic with mild pallor, respiratory rate of 30/min, heart rate of 105/min, BP of 100/60mmHg. Electrocardiography (ECG) showed sinus tachycardia. Chest X-ray had features of cardiomegaly and pulmonary edema. Bedside echocardiography of global hypokinesia with ejection fraction of 30%.

a) What are your differential diagnosis for this lady? (5 marks)
b) Outline the overall management of peripartum cardiomyopathy. Details of initial resuscitation are not needed. (25 marks)

Question D

Your medical registrar had inserted a central line for the patient. However, the guidewire was lost during the procedure and it was found in her femoral vein by X- ray.

How would you organize the interview with the family? Include the general principles in carrying out an interview to reveal a medical error. (15 marks)