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**POSTGRADUATE INSTITUTE OF MEDICINE**  
**UNIVERSITY OF COLOMBO**

**MD (PAEDIATRICS) EXAMINATION – MARCH/APRIL 2014**

**Date :-7<sup>th</sup> March 2014**

**Time :- 9.00 a.m. – 12.00 noon**

**PAPER I**  
**(STRUCTURED ESSAY QUESTIONS)**

Answer **all five** questions.

Answer each question in a **separate book**.

**Q.1.**

- 1.1. State four (04) different types of chromosomal abnormalities, naming one (01) syndrome in each abnormality. (20 marks)
- 1.2. Discuss the genetics of Down syndrome. (40 marks)
- 1.3. Discuss briefly the effective preventive strategies for the reduction of congenital abnormalities (40 marks)

**Q.2.**

- 2.1. State the classification of supraventricular tachycardia, giving three (03) examples for each type. (30 marks)
- 2.2. List five (05) cardiac complications of supraventricular tachycardia (20 marks)
- 2.3. Outline the management of supraventricular tachycardia. (30 marks)
- 2.4. State the problems encountered in the management of a neonate with supraventricular tachycardia. (20 marks)

Contd..../2-

**Q.3.**

- 3.1. State the aetiological classification of chronic haemolytic disorders. (15 marks)
- 3.2. Mention one (01) disorder that represents each group mentioned in 3.1. (15 marks)
- 3.3. Describe the pathogenesis of the commonest disorder seen in Sri Lanka that has been mentioned in 3.2. (30 marks)
- 3.4. Outline strategies for the effective management of the burden of thalassaemia in Sri Lanka. (40 marks)

**Q.4.**

- 4.1. Describe the physiological mechanism adopted by the lungs to minimise ventilation-perfusion (V/Q) mismatch. (30 mark)
- 4.2. Apart from hypoxaemia, state the most striking feature noted in arterial blood gas analysis in a patient with significant V/Q mismatch. (20 marks)
- 4.3. State the most important ventilator setting to be changed in a child with V/Q mismatch to improve oxygenation. (20 marks)
- 4.4. Describe how hypoxemia results from V/Q mismatch, while carbon dioxide level remains normal. (30 marks)

**Q.5.**

- 5.1. Name eight (08) poisonous snakes in Sri Lanka. (20 marks)
- 5.2. Discuss the pathophysiology of poisonous snake bites. (40 marks)
- 5.3. Outline the principles of management of snake bites. (40 marks)

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**POSTGRADUATE INSTITUTE OF MEDICINE**  
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**MD (PAEDIATRICS) EXAMINATION – MARCH/APRIL, 2014**

Date :- 10<sup>th</sup> March 2014

Time :- 9.00 a.m. – 12.00 noon

**PAPER II – CASE HISTORIES**

Answer **all five** questions.

Answer each question in a **separate book**.

1. A 3-year-old child presented with progressively increasing vomiting of two days duration. Mother says the urine output is low and bowels have not opened for the last two days. There have been two previous admissions to the local hospital for repeated vomiting requiring intravenous fluids.

He is the first born to non-consanguineous parents and was diagnosed to have diaphragmatic hernia few hours of birth. Following surgery he was in NICU for one month. He is on prophylactic steroid inhaler therapy for recurrent episodes of wheezing.

On examination his weight is 11 Kg and length 81 cm (both just below the 3<sup>rd</sup> percentile). He is febrile (39<sup>o</sup> C). Respiratory rate 32/minute. Pulse 150/minute and low volume. Capillary refill time 4 seconds. There are few scattered crepitations. Abdomen is distended and tender. Bowel sounds are sluggish.

Oxygen saturation is 92% in air.

Chest x-ray reveals a few bilateral inflammatory shadows with hyper inflated lung fields.

Haemoglobin	11 g/dL	(11-16)
HCT	36%	
WBC/DC	18x10 <sup>9</sup> /L N 80% L 20%	
Platelet count	180 x10 <sup>9</sup> /L	(150-400)
C-reactive proteins	96 mg/dL	(<6.0)
Serum Na	132 mEq/L	(134-145)
Serum K	3.0 mEq/L	(3.5-5.0)
Blood urea	7.0 mmol/L	(4-6)

Contd..../2-



- 1.1. Explain briefly the sequence of clinical events that led to this acute presentation. (40 marks)
- 1.2. Give two (02) investigations and their expected findings which will help you to confirm the **underlying** condition. (30 marks)
- 1.3. Briefly outline your immediate management. (30 marks)



2. An 8-year-old boy was transferred to a tertiary care centre from a peripheral hospital with a 5 day history of abdominal pain. He had fever, loss of appetite and nonspecific joint pains for three weeks for which he was treated by a General Practitioner. Meanwhile, he developed cough and wheeze and was treated by the same GP with several medications. He is a known wheezer with mild frequent exacerbations and is on prophylactic steroid inhalers.

There is no history of vomiting, headache, drowsiness, rashes or joint swelling. Bowel habits are normal.

He was passing urine well and there were no urinary symptoms. His immunization is age appropriate. Growth and development are normal. He is the first child born to non-consanguineous healthy parents. The 2-year old younger brother is healthy. There is no family history of renal disease in childhood. His paternal grandfather died of chronic renal failure.

On examination his weight was 22 kg (25<sup>th</sup> percentile) and height was 127 cm (50<sup>th</sup> percentile). He was ill looking, afebrile, and not drowsy. There was no pallor, icterus or oedema. Generalized lymphadenopathy was present. There was no skin rashes, oral ulcers or joint swelling. Pulse was 96/minute, blood pressure 160/100 mmHg and there were no murmurs.

Examination of the abdomen revealed bilateral flank masses. Liver and spleen were not palpable. There was no free fluid in the abdomen. Glasgow Coma Scale was 15 and there were no focal neurological signs. Respiratory system was clinically normal except for occasional rhonchi.

#### Investigations:

Haemoglobin	13.7 g/dL	(11-16)
HCT	43%	
WBC/DC	27 x 10 <sup>9</sup> /L N 41 %, L 57%, M 2%	
Platelet count	103 x 10 <sup>9</sup> /L	(150-400)
ESR	81mm in 1 <sup>st</sup> hour	
Serum creatinine	129 µmol/L	(26-65)
Blood urea	6.5 mmol/L	(4-6)
Serum albumin	39 g/L	(40-53)
Serum sodium	140 mEq/L	(135-145)
Serum potassium	5.6 mEq/L	(3.5-5.0)
Serum bicarbonate	24mmol/L	(22-29)
ECG	Normal	

Contd...../4-

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Ultrasound scan of abdomen showed no hepato-splenomegaly. There was evidence of bilateral acute renal parenchymal disease.

- 2.1. What is the **most likely** reason for the renal involvement? (30 marks)
- 2.2. List seven (07) important investigations that should be performed.  
(35 marks)
- 2.3. Outline the important steps in the acute management of this child.  
(35 marks)

Contd...../5-

3. You are the casualty Paediatrician at the Hambantota hospital. You receive a telephone call from a nearby school that a 12 year old athlete is being rushed into hospital by ambulance having collapsed, while playing in the school ground.

3.1. List **five (05)** possible causes that you would think of **at this stage** (before seeing the patient) for sudden collapse during sports. (30 marks)

On arrival you find that he is accompanied by the sports teacher, a classmate and paramedics. The teacher says that he is the best athlete in the province who has hopes of entering the national team. According to the classmate he had been practicing continuously from 10 am that day for an athletic event which was followed by drill practice. He had collapsed during the drill practice around 2 pm.

He had complained of headache, dizziness and abdominal pain during the drill practice, but this information had not been conveyed to the sports teacher. At the time he "collapsed" he was noted to be agitated, confused, febrile and profusely perspiring. He was taken to the sickroom assuming he had fainted. As he vomited several times and continued to be restless and agitated he was brought to hospital.

He is the 2<sup>nd</sup> child of non-consanguineous healthy parents. There is no family history of unexpected deaths.

On examination he is restless and confused. Axillary temperature is 40<sup>o</sup> C. He is of average build. His conjunctivae are not pale. There is no evidence of external injuries, but his thighs and calves are tender. Oxygen saturation is 90% in air. Pulse is 100/ minute & regular. Blood pressure is 90/60 mmHg. Rest of the cardiovascular system is normal. There is no abnormality in respiratory system and abdomen.

His initial investigations results are as follows:

Haemoglobin	15 g/dL	(13-15)
Haematocrit	48%	
WBC/DC	13x 10 <sup>9</sup> /L	(5-11)
	N 56%, L 40%, E 4%	



Platelet count	170 x 10 <sup>9</sup> /L	(150 – 400)
Random blood sugar	2.4 mmol/L	(5-7)
Arterial blood gas:		
pH	7.32	(7.34-7.44)
PaCO <sub>2</sub>	30 mmHg	(35-48)
PaO <sub>2</sub>	83mm Hg	(85-105)
HCO <sub>3</sub> <sup>-</sup>	16mmol/L	(21-28)
BE	-8	(-3 to +3)
Serum electrolytes		
Na <sup>+</sup>	150 mmol/L	(135-145)
K <sup>+</sup>	4.5mmol/L	(3.3-4.6)
Blood urea	8 mmol/dL	(2.5-6.4)
ECG and 2D Echocardiogram	normal	

- 3.2. What is the most likely diagnosis? (15 marks)
- 3.3. Outline the management of this child over the first 24 hours. (35 marks)
- 3.4. How could this condition have been avoided? (20 marks)



4. A 3 ½ year old boy is admitted with a history of swelling of right thigh and refusal to walk for one day. His mother is working in the Middle East. His maternal aunt who is looking after him complains that he is "a difficult child". She says the preschool teacher has complained several times that he is aggressive and disturbing the class.

The aunt is not aware of the birth history or immunization status. Child Health Development Record is not available. He has been in hospital recently for removal of a foreign body from the nose. He was seen by a doctor at the accident ward for black eye following a fall 6 months ago.

On examination his height and weight are at -3SD. He is in pain, not cooperative and the right thigh is swollen and tender. X ray reveals a fracture of right femur. The aunt insists on early discharge because she has three children of her own to look after.

- 4.1. Mention three (03) possible conditions you would consider in this clinical scenario. (30 marks)
- 4.2. For **each** of the three (03) conditions mentioned in 4.1, state **two (02) relevant questions** you would ask in the history. (30 marks)
- 4.3. List three (03) relevant initial investigations you would perform. (15 marks)
- 4.4. Enumerate five (05) **important aspects** in the management of this child (25 marks)

5. A 14-day-old boy was admitted with 3 episodes of apnoea during the preceding 24 hours. In the previous three days, his parents have sought medical advice for recurrent vomiting and irritability and were reassured that the symptoms were due to gastro-oesophageal reflux. He was treated with domperidone, without response.

The episodes of apnoea lasted for approximately 10 seconds and recovered with stimulation. There was no history of fever, trauma or any respiratory symptoms and the baby fed well in between these episodes. Feeding was mostly with formula saying that breast milk was inadequate.

The pregnancy was unremarkable and the baby was born at term by an uncomplicated caesarian section because of past section. His birth weight was 3.3 kg. The mother had no complications during ante-natal period but was on treatment for a depressive disorder. The older child is a 28 months old healthy boy.

On admission, he developed two more brief episodes of apnoea. The baby's weight was 2.9 kg. He was afebrile and had signs of dehydration. Heart rate was 140 per minute with normal pulse volume. Respiratory system examination was normal with equal air entry bilaterally. Abdominal and neurological examination did not reveal any abnormality.

#### Initial investigations:

Haemoglobin	15 g/dL	(14 – 20)
Random blood sugar	4.3mmol/L	(2.6 – 6)
C-reactive protein	<6 mg/dL	(<6)
Serum creatinine	54 µmol/L	(44-88)
Blood urea	8 mmol/L	(2.5 – 6)
Serum sodium	132 mmol/L	(134 – 145)
Serum potassium	3.3mmol/L	(3.5 – 6)
Serum chloride	90mmol/L	(95 – 106)
Urinary chloride	<10mmol/L	(<10)
Arterial blood gas		
pH	7.42	
pCO <sub>2</sub>	4 kPa	(4 – 7.6)
pO <sub>2</sub>	10.2 kPa	(9.3 – 13.3)
Bicarbonate	26 mmol/L	(18 – 25)
Base excess	+1	(-3 -+3)
Serum ionized calcium	0.7 mmol/L	(1.0- 1.3)

- 5.1. Write your interpretation of the biochemical abnormality. (25 marks)
- 5.2. List three (03) possibilities to explain these findings. (30 marks)
- 5.3. Write five (05) other investigations which are required for the management of this patient based on the information given above. (20 marks)

Despite appropriate treatment based on the above investigations given, this baby developed further apnoea and required intubation.

- 5.4. What is the most likely diagnosis and briefly state the management of this condition. (25 marks)