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POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

MD (PAEDIATRICS) EXAMINATION – JANUARY/FEBRUARY 2013

Date :- 21st January 2013 **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. Discuss briefly the risk factors that are known to contribute to the development of childhood asthma. (35 marks)

1.2. Describe the pathogenesis of acute severe asthma. (30 marks)

1.3. List the initial medications used in acute severe asthma and indicate their mode of action/s. (20 marks)

1.4. Briefly outline the inherent human factors that reduce the efficacy of inhaled corticosteroids in asthmatics under 3 years of age. (15 marks)

Q.2

2.1. List the criteria that are considered for the introduction of screening for a given disorder in the general population. (18 marks)

2.2. Briefly describe the currently available research evidence that justifies the introduction of universal hearing screening for newborns in Sri Lanka. (40 marks)

2.3. Indicate the tests that are effective in the detection of hearing impairment in infants under 6 months of age. (12 marks)

2.4. Briefly discuss the interventions that are known to prevent sensorineural deafness in children. (30 marks)

Contd..../2-

Q.3.

3.1. Mention the hormones involved in the initiation and progress of puberty. (20 marks)

3.2. List the sequence of physical events that occur in normal male puberty. (20 marks)

3.3. Briefly describe the initial approach with relevant investigations in a 16 year old boy with no signs of the onset of puberty. (35 marks)

3.4. Discuss the management options for delayed puberty in a 16 year old male. (25 marks)

Q.4.

4.1. Mention two (02) physiological abnormalities seen in the pulmonary circulation in persistent pulmonary hypertension (PPHN) in the newborn. (10 marks)

4.2. Briefly describe the pathological basis of the aetiology of PPHN. (30 marks)

4.3. List the investigations you would perform to confirm the diagnosis of PPHN and indicate the expected abnormalities. (25 marks)

4.4. Outline the treatment modalities available for management of severe PPHN. (35 marks)

Q.5.

5.1. Briefly describe the global issues and challenges that have a direct impact on the health of children. (40 marks)

5.2. Discuss the decisions that have to be made by policy makers to face the above challenges. (40 marks)

5.3. What are the health problems faced by children following natural disasters? (20 marks)

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MD (PAEDIATRICS) EXAMINATION – JANUARY/FEBRUARY 2013

Date :- 22nd January 2013 **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 29 year old mother, who has been married for 7 years and had two miscarriages, delivered a baby boy at 34 weeks by an emergency caesarean section due to severe pregnancy induced hypertension. Mother was also diagnosed to have gestational diabetes mellitus at 32 weeks and was controlled on diet alone. Baby was born with an Apgar score of 9 and 10 at 1 min and 5 min respectively. Birth weight was 3.5 kg. At 2 hours of age he was noted to be jittery and was sent to the NICU.

   Investigations at the NICU were

Capillary blood sugar	48 mg/dl	
Serum calcium	1.67mmol/L	(1.8 -2.85)
Serum magnesium	0.85 mmol /L	(0.81 -1.0)

1.1. Give three (03) conditions that could have contributed to the hypocalcaemia.
(15 marks)

The baby was given a slow infusion of calcium gluconate and kept under observation in the NICU. He was well and the repeat serum calcium was normal. He was sent to the post natal ward on the following day where he had to remain as his mother's blood pressure continued to be high. On day 4 the baby was noted to have a temperature of 38.6^0C and was not sucking well. Therefore he was readmitted to the NICU.

On admission the medical officer found that the baby was having an erythematous, tender, indurated area on the inner aspect of the right upper arm.

1.2. List two (02) likely causes for the erythematous tender indurated area.
(10 marks)

Contd...../2-

Having taken blood for the necessary investigations he was started on IV benzyl penicillin and gentamicin.

The following are the results of the blood tests done on day 4

Hb	18 g/dl	
WBC	19.3 X 10^9 / L	N- 72%, L- 22%, E -4%, M- 2%
Platelet count	340 X 10^9 / L	
C-reactive protein	197 mg/L	(< 5)

On day six he was still having high fever and was not moving the right arm. Blood culture identified a heavy growth of methicillin resistant *Staphylococcus aureus.*

1.3. State the most likely clinical diagnosis. (15 marks)

1.4. Enumerate the steps in the management of this baby. (40 marks)

1.5. Outline the preventive measures that are indicated in this clinical scenario (20 marks)

Contd.../3-

2. A 12 year old child was admitted with a history of passing red coloured urine for two days. He has been unwell for three days with a sore throat, fever, myalgia and loin pain. He has no dysuria or frequency. He has not had any other significant illnesses in the past. However mother recalls an episode of dark coloured urine which had spontaneously subsided within a few days.

   He is the eldest child born to healthy, non consanguineous parents. There are two other siblings who are well.

   On examination, his temperature was 37.5^{0}C. His throat was inflamed, but there were no exudates. Cervical lymph nodes were palpable. He was not pale or icteric. His height was on the 50th percentile and weight on the 25th percentile. There were no skin rashes or oedema. Blood pressure was 100/70 mmHg. There were no palpable masses or bladder on examination of the abdomen. Cardio vascular, respiratory and nervous systems were clinically normal.

   The results of investigations are as follows:

WBC	6.5 x 10^9/L – N 35%, L 55%	
Platelet count	180 x 10^9/L	
Hb	12g /dl	
ESR	20mm 1st hr	
Urine	Protein +++	
Pus cells	5-10/hpf	
Red cells	>100/hpf	
Red cell casts	++	
Serum sodium	138 mEq/L	(135-145)
Serum potassium	5 mEq/L	(3.5-4.5)
Blood urea	11.0 mmol/L	(1.8-6.4)
Serum creatinine	130 µmol/L	(26-65)
Urine culture	No growth	
U/S scan renal tract	Kidneys are enlarged with obscure cortico-medullary demarcation. There is evidence of renal parenchymal disease	

2.1. Give three (03) differential diagnoses that you would consider in this child. (30 marks)

2.2. Mention five (05) investigations needed to arrive at a diagnosis giving reasons (30 marks)

2.3. Outline the principles in the management of this child. (40 marks)

Contd..../4-

3. An 8 year old boy is referred for evaluation.

He is the elder of two boys born to non-consanguineous parents of average height. He was born at term following an uneventful pregnancy. His birth weight was 3.2 kg. There were no concerns about his health, growth and development. He was one of the tallest in his class in the nursery and continued to be among the tallest in all the grades. He was dark in complexion when compared to his brother which the parents attributed to his participation in sports. He has excelled in athletics and swimming and had always been chosen to represent his school at National level.

The referral was by the games teacher as a result of several parents complaining that this child was 'being given performance enhancing drugs'.

His examination findings are as follows :

Height	137cm (97^{th} percentile)
Weight	25kg (50^{th} percentile)
Mother's height	159cm (25^{th} percentile)
Father's height	176cm (50^{th} percentile)
Younger brother's height – on the 50^{th} percentile	

There were no skin lesions or rashes. He had a few facial acne and scanty axillary hair. There was no significant body hair.

Cardiovascular and respiratory systems and abdominal examination were normal. Blood pressure was 95/60 mmHg

At 3 years of age CHDR had recorded a height of 99cm (+1SD) and the weight at the median.

At 6 years of age his height had been recorded as 125 cm (97^{th} percentile) and the weight had remained on the 50^{th} percentile.

Investigations:

Serum sodium	138 mEq/L	(135 – 145)
Serum potassium	4.2 mEq/L	(3.5 – 5.6)
Blood urea	20mg/dl	(15 – 40)
Serum creatinine	0.5 mg/dl	(0.3 – 0.7)
ALT	30 U/L	(<40)
TSH	3.5 mIU/ml	(0.7 – 5.7)
FT_4	1.5 ng/dl	(0.8 – 2.0)

Contd..../5-

Bone age was 11 years at chronological age of 8 years.

3.1. Give two (02) possible diagnoses. (10 marks)

3.2. State the most useful physical sign to differentiate the conditions given in (3.1) with the expected findings in the two conditions mentioned. (20 marks)

3.3. Give three (03) further investigations to differentiate the two (02) conditions given in (3.1) with the expected findings. (30 marks)

3.4. Describe the principles of management of any one of the conditions mentioned in (3.1). (40 marks)

Contd..../6-

4. An 11 year old boy was admitted to the paediatric ward with a history of fever for 5 days and vomiting for 2 days. He also has had loss of appetite for the last 2 weeks. His bowel habits have been normal.

   Both parents are executives of a private firm. He was born at term. There were no antenatal or postnatal complications. No past history of any other significant illnesses.

   On examination his weight was on the 25th percentile and height was at the 10th percentile. He was febrile and ill. Not pale and not icteric. Cardiovascular and respiratory systems were clinically normal. BP was 100/70 mmHg.

   On examination of the abdomen the liver was palpable 3 cm below the costal margin and was tender. There was no splenomegaly or free fluid.

   Investigations:

Hb	12g/dl	
WBC/DC	21 x 10^9 /L	N - 65%, L - 34%, M - 1%
Platelet count	298 x 10^9/L	
Blood urea	5 mmol/L	(4-6)
Serum creatinine	40 µmol/L	(20-80)
Serum sodium	142 mEq/L	(135- 145)
Serum potassium	3.8 mEq/L	(3.5-4.5)
Serum chloride	102 mEq/L	(96-106)
C- reactive protein	190 mg/L	(<6)
ALT	60 U/L	(20-40)
AST	60 U/L	(20-40)
US Scan of the abdomen	- multiple hypo-echoic lesions on the right lobe of the liver and no other abnormalities	
Blood Culture	No growth after 48 hours	

4.1. What is the most likely diagnosis? (20 marks)

4.2. List two (02) other conditions you would consider in the differential diagnosis. (20 marks)

4.3. Mention three (03) other aspects in the history you would elicit in order to identify any underlying cause for the condition given in 4.1 (15 marks)

4.4. State three (03) investigations which are of value in the management. (15marks)

4.5. Outline the steps in the management. (30marks)

Contd..../7-

5. A 9 year old boy was admitted to a paediatric ward with a history of fever and progressive drowsiness of four days duration. He developed generalized tonic clonic convulsions on the day of admission. His mother revealed that he was unwell with irritability and headache over the past 3 weeks with on and off vomiting. His past medical history was unremarkable except for a history of febrile convulsion at the age of 2 years.

On examination his temperature was 38^0C, drowsy with a GCS of 8/15. There was no neck stiffness and Kernig sign was negative. The examination of the cranial nerves was normal. Upper and lower limbs were hypertonic with exaggerated reflexes. Funduscopic examination was normal.

Investigations:

Hb	12g/dl	
WBC/DC	12x 10^9/L N-60%, L-40%	
Platelet count	260x10^9/L	
C-reactive protein	80 mg/L	(<6)
ESR	65 mm in 1st hour	
Serum sodium	135 mEq/L	(135-145)
Serum potassium	4 mEq/L	(3.5-5.0)
Serum calcium	2.2 mmol/L	(2.2-2.7)
Blood sugar	80 mg/dl	
ALT	25 U/L	(10-40)
AST	30 U/L	(10-48)
Serum creatinine	0.5 mg/dl	(0.3-0.7)

5.1. List three (03) most likely diagnoses you would consider in this child at this stage. (15 marks)

There was no clinical improvement in his condition in spite of the initial treatment and convulsions continued. He was admitted to the PICU for further management. On admission his GCS remained at 8/15. Pulse rate was 110/min with a blood pressure of 110/70 mmHg. Rest of the examination was normal.

Investigations:

Serum sodium	116 mEq/L	(135-145)
Serum potassium	4 mEq/L	(3.5-5.0)
Serum calcium	2.3 mmol/L	(2.2-2.7)
Blood sugar	90 mg/dl	
Blood culture	No growth after 48 hours	

Contd..../8-

5.2. List two (02) clinical conditions that could cause hyponatraemia in this child. (15 marks)

5.3. Briefly describe the clinical features and investigations that would help you to differentiate the two (02) conditions mentioned in 5.2. (30 marks)

5.4. Outline the immediate management of this child after admission to PICU. (40 marks)