Self-assessment questions

Questions

Case 1

An 11-year-old boy presents to his local hospital with a one-month history of involuntary movements, described as 'tics' over the last two weeks. He has been more clumsy than usual, and his mother describes slurred speech. He also has intermittent arthralgia and has had a recent non-pruritic erythematous rash on his trunk and limbs. On examination he had brief irregular spasmodic movements of all four limbs but was otherwise alert and well with an unremarkable neurological examination.

He is admitted for observation. He has no abnormal or involuntary movements during sleep, and remains well and afebrile with no additional symptoms.

Full blood count, renal and liver function tests are normal with C-reactive protein <1 mg/dL.

1) Which ONE of the following further investigations would be most appropriate at this stage?
   a) Psychological evaluation
   b) Serum Copper
   c) Anti streptolysin-O titre
   d) EEG
   e) Autoimmune profile

2) On day two of his admission he is noted to have a soft systolic murmur. What is his ECG most likely to show?
   a) Sinus tachycardia
   b) Prolonged PR interval
   c) Left bundle branch block
   d) Abnormally tall R wave in V6 and a deep S wave in V1
   e) Prolonged QT_c

3) What is his echocardiogram likely to show?
   a) Vegetation on the mitral valve
   b) Mitral regurgitation
   c) Aortic stenosis
   d) Hypertrophic cardiomyopathy
   e) Normal echo – innocent murmur

4) Which THREE treatments are most appropriate?
   a) Aspirin
   b) IV immunoglobulins
   c) Methylprednisolone
   d) Haloperidol
   e) Cognitive behavioural therapy
   f) Ceftriaxone
   g) Phenoxymethylpenicillin
   h) Phenytoin
   i) Enalapril

Case 2

A 6-year-old boy presents with a 6-day history of fever, lethargy, headache, cough, and intermittent abdominal pain, which started just over 3 weeks after returning from a one-month visit to Sierra Leone. He stayed with his grandparents in a village and was well during his stay. He has no underlying medical problems. He did not receive any malaria prophylaxis or travel vaccinations. He has a temperature of 39 °C, and looks moderately unwell, mildly dehydrated but haemodynamically stable with a 2 cm liver edge, and mild abdominal tenderness with no guarding or rigidity.

1) Which THREE of the following conditions are the most UNLIKELY, based on incubation period and clinical presentation?
   a) Falciparum malaria
   b) Dengue fever
   c) Ebola virus disease
   d) Tonsillitis
   e) Lassa fever
   f) Amoebic liver abscess
   g) *Salmonella typhi*
   h) Non-typhoid salmonella
   i) Influenza

2) A rapid diagnostic test for Falciparum malaria is positive, and other blood results are still awaited. Which ONE of the following would be the LEAST APPROPRIATE anti-malarial?
   a) Oral artesunate–amodiaquine
   b) Oral atovaquone–proguanil
   c) Oral chloroquine
   d) Oral quinine + clindamycin
   e) Oral artemether–lumefantrine

On further questioning, it is revealed that 10-days ago he had a positive malaria blood film and was treated with oral atovaquone–proguanil. The thick and thin film results are now negative, but the rapid test is repeated and remains positive. He has also developed vomiting.

Further bloods are:

Haemoglobin 120 g/L, White cell count 3.0×10^9/L, Platelets 340×10^9/L

Alanine transaminase 140 U/L Bilirubin 32 mg/dL

C-reactive protein 120 mg/dL

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HIV, Hepatitis B, Hepatitis C viruses negative
Blood culture awaited.

3) What is the most appropriate assessment and management?
   a) His on-going illness is most likely due to resistance of *Plasmodium falciparum* to atovaquone—proguanil. He should be treated with oral artesunate—amodiaquine for 3 days.
   b) He has severe malaria and should be admitted and given IV quinine and IV fluids.
   c) He should have another course of atovaquone—proguanil.
   d) He is likely to be unwell from another cause but should be admitted and have repeat malaria films.
   e) Bloods are typical of a viral haemorrhagic fever and he should be isolated with full personal protective equipment.

4) After 36-hours Gram-negative bacilli are identified from his admission blood culture. Which THREE of the following antibiotics are the most effective against the most likely organism?
   a) Linezolid
   b) Ceftriaxone
   c) Doxycycline
   d) Gentamicin
   e) Azithromycin
   f) Co-amoxiclav
   g) Flucloxacillin
   h) Ciprofloxacin
   i) Amoxicillin

After 3 days on the appropriate antibiotic he is feeling much better, but has on-going fever up to 38.5 °C.

5) Which is the most appropriate assessment?
   a) It is likely that he has a secondary bacterial infection and additional antibiotic cover is required.
   b) Fungal infection is likely and amphotericin should be added.
   c) He is clinically improving, and a slow response in temperature is expected with enteric fever, so it is not necessary to change treatment.
   d) He should have a lumbar puncture to rule out *Salmonella typhi* meningitis.
   e) He should have a culture taken of his bone marrow, to determine whether the bacteria is still present.

Case 3

A five-year-old boy with homozygous sickle cell disease presents with a12-hour history of cough and fever. On arrival he appears well and afebrile. He has intermittent cough, oxygen saturations are 96% in air and he is currently pain-free and eating and drinking well. There are no focal chest signs. He has an easily audible systolic murmur at the left sternal edge. His abdomen is soft and non-tender with a palpable spleen and faecal loading. He has been admitted four times in the past year with chest symptoms.

1) What are the THREE most important investigations on admission?
   a) Echocardiogram
   b) ECG
   c) Full blood count
   d) Renal function
   e) Bilirubin
   f) Group and save
   g) Nasopharyngeal aspirate
   h) Chest X-ray
   i) Mycoplasma serology

2) Which ONE of the following options would be the most appropriate management at this time?
   a) Admit, facial oxygen, intravenous access, parenteral antibiotics, morphine infusion, intravenous maintenance fluids.
   b) Admit and take bloods, start oral co-amoxiclav, regular paracetamol and ibuprofen and morphine as needed, encourage oral fluids.
   c) Discharge home with oral co-amoxiclav, advise regular oral analgesia including morphine and advise to return if he deteriorates.
   d) Admit for observation, facial oxygen, intravenous hyperhydration and antibiotics.
   e) Discharge home with salbutamol inhaler, oral co-amoxiclav, prednisolone and advise to return if he deteriorates.

The child is admitted and started on IV maintenance fluids +20%, high flow oxygen and oral analgesia. 24-hours later this child deteriorates and has fever, vomiting, severe abdominal pain, and saturations of 94%. Bloods show:

Haemoglobin 70 g/dL, White cell count 24 $\times$ 10^9/L, Neutrophils 15.3 $\times$ 10^9/L
Lymphocytes 7.7 $\times$ 10^9/L, Platelets 433 $\times$ 10^9/L
C-reactive protein 138 mg/dL
Bilirubin 22 mg/dL
Renal and liver function tests are otherwise normal.

3) Which THREE of the following are the most likely possible causes of his deterioration?
   a) Fluid overload with pulmonary oedema
   b) Pneumothorax
   c) Worsening LRTI
   d) Bronchospasm
   e) 'Splinting' of diaphragm due to abdominal pain
   f) Pleural effusion
   g) Parvovirus infection
   h) Pulmonary hypertension
   i) Acute abdominal crisis

4) Which of the following would be appropriate management? Choose 3
   a) Admission to PICU for intubation and ventilation
   b) Intravenous cefuroxime
   c) Non-invasive ventilation with CPAP
   d) Blood transfusion to achieve haemoglobin of 10 g/dL