Pre-Eclampsia / Eclampsia SAQ

Q1) . A 20-year-old primigravida presents at 37 weeks gestation with jaundice, headache, blurred vision and hypertension (140/90 mmHg). The antenatal period was otherwise unremarkable.
She is febrile, drowsy, pale, icteric and has pedal oedema. The uterus is palpated as for a full term pregnancy with a normal CTG trace. Examination is otherwise normal. The following are her early blood results:

Parameter	Patient Value	Normal Adult Range
Hb	80 G/L*	115 – 160
Platelets	52 x 10^9/L*	140 – 400
International Normalised Ratio	1.8*	0.9 – 1.3
Activated Partial Thromboplastin Time	55 seconds*	25 – 38
Lactate Dehydrogenase	654 U/L*	110 – 250
Fibrinogen	1.0 G/L*	1.5 – 4.0
Total Bilirubin	51 micromol/L*	< 20
Urea	30 mmol/L*	3 – 8
Creatinine	298 micromol/L*	70 – 120
Potassium	5.1 mmol/L*	3.2 – 4.5

a) List four likely diagnoses for this clinical presentation (4 marks).
b) For each of your differential diagnoses:
i. List the important management interventions (4 marks).
ii. List one additional diagnostic test (4 marks)

(a)

- Pre-eclampsia
- HELLP Syndrome
- Sepsis with DIC
- HUS-TTP
- Acute fatty liver of pregnancy

Pre-eclampsia
i. Deliver baby
ii. Control BP
Hydralazine, beta blockers
I SNP/GTN if intravenous agent required.
iii. Prevention of seizures
iv. Magnesium sulphate
Urinalysis – protein, WBCs, RBCs, casts
Evidence of infection or proteinuria (pre-eclampsia)
Renal US

HELLP Syndrome
i. Deliver baby
ii. Regular monitoring of platelet count and liver function
iii. Supportive measures whilst observing in HDU for dangerous complications – hepatic haemorrhage/rupture, progressive renal failure, pulmonary oedema.
Peripheral blood film smear
Reticulocyte count, haptoglobins, conjugated/unconjugated bilirubin
Haemolysis screen
Full liver function tests

Sepsis with DIC
i. Timely delivery of baby in consultation with obstetrician.
ii. Early broad-spectrum antibiotics.
iii. Cardiovascular support – adequate volume resuscitation and establish MAP > 65mmHg.
Blood, sputum, urine and vaginal swab for MC&S
Septic screen

HUS-TTP
i. Deliver the baby.
ii. Fresh frozen plasma
iii. Therapeutic plasma exchange
iv. Corticosteroid therapy
v. Monoclonal antibody therapy – Rituximab
Evidence of haemolysis or MAHA
Reticulocyte count, haptoglobins, conjugated/unconjugated bilirubin
Haemolysis screen
ADAMTS 13

Acute fatty liver of pregnancy
i. Timely delivery of baby once mother stabilised
ii. Correction of DIC
iii. Supportive therapy
iv. Monitoring and treatment of complications post delivery e.g. pancreatitis
v. Consideration for liver transplantation in with irreversible severe liver failure despite delivery and aggressive supportive care

Full set liver function tests
BSL
Liver US
Evidence of haemolysis or MAHA
Reticulocyte count, haptoglobins, conjugated/unconjugated bilirubin
Haemolysis screen

C) What are the diagnostic criteria for pre-eclampsia?
(4 marks)
Pre-eclampsia – hypertension occurring after 20 weeks gestation and resolving within 3 months of delivery with the following specific features:

- SBP > 140mmHg or DBP > 90mmHg

+ one or more of

- proteinuria (>0.3g/24hrs)
- renal impairment – proteinuria, high Cr
- liver disease – epigastric pain, liver tenderness, elevated transaminases
- neurological problems – seizures, visual disturbance, papilloedema, clonus
- haematological disturbance – thrombocytopaenia, haemolysis, DIC
- fetal growth restriction – non reassuring CTG, reverse flow on Doppler, IUGR
- severe if SBP >160 or DBP >110 or severe organ dysfunction

D) . Name 6 risk factors for this condition. (6 Marks)

- PET during another pregnancy
- advanced maternal age
- multiple pregnancy
- high BMI
- conception before age 20
- connective tissue disorders
- protein C and S deficiencies
- factor V leiden mutation
- hyperhomocysteinemia

E) Complete this table. *(6 marks)*

	Foetal complications of eclampsia [three (3) examples]	Maternal complications of eclampsia [three (3) examples]
1	Premature delivery	Intracerebral haemorrhage
2	Abruptio placentae	Transient blindness
3	Intrauterine Asphyxia	Cardiorespiratory arrest

Q2. A 25-year-old female with a 5-day history of anorexia, nausea and vomiting presents to your emergency department with a seizure. She is G3P2 and 30/40 gestation. The following blood results are obtained:

Parameter	Patient Value	Adult Normal Range
Fi02	0.28	
pH	7.54*	7.35 - 7.45
p02	87 mmHg (11.6 kPa)	
pC02	33.0 mmHg (4.4 kPa)*	35.0 - 45.0 (4.6 - 6.0)
Sp02	94%	
Bicarbonate	28.0 mmol/L*	22.0 - 26.0
Base Excess	4.5 mmol/L*	-2.0 - +2.0
Sodium	127 mmol/L*	135 - 145
Potassium	2.3 mmol/L*	3.5 - 5.0
Chloride	84 mmol/L*	95 - 105
Glucose	4.8 mmol/L	3.5 - 6.0
Creatinine	354 µmol/L*	45 - 90
Urea	29.0 mmol/L*	3.0 - 8.0
Haemoglobin	80 g/L*	120 - 160
White Cell Count	25.4 x 10^9/L*	4.0 - 11.0
Platelet count	29 x 10^9/L*	150 - 350
Prothrombin time	15.0 sec	12.0 - 16.5
INR	1.1	0.9 - 1.3
APTT	28.0 sec	27.0 - 38.5
Fibrinogen	5.7 g/L*	2.0 - 4.0
D-Dimer	16.8 mg/L*	< 0.5

Describe the important abnormalities and give one explanation for each? (10 marks)

- Raised Aa gradient (aspiration, pneumonia, any plausible)
- Metabolic alkalosis -dehydration, vomiting
- Raised anion gap – sepsis, seizures, renal failure
- Respiratory alkalosis- pain, anxiety, post-ictal
- Hypokalaemia, hyponatraemia : dehydration
- AKI – sepsis, TTP, dehydration,eclampsia
- Haemoconcentration – dehydration
- Leucocytosis – sepsis
- Thrombocytopenia –sepsis, TTP, HELLP
- Elevated fibrinogen, D-Dimer – sepsis

Systematically:

- The patient is alkalaemic. This pH is in excess of what would normally be expected in pregnancy
- There is normoxia (PaO_2 is satisfactory) but the A-a gradient is raised.
- The CO_2 is within normal limits for this stage in pregnancy
- Oxygen saturation is lower than would be expected for this level of alkalosis (i.e. there is an unexplained right-shift of the oxyhaemoglobin dissociation curve).
- Base excess and bicarbonate changes represent the normal metabolic alkalosis of pregnancy, made more severe by the vomiting
- The patient is hyponatremic, though it is not so severe as to produce the seizures. One possible explanation for this is the fluid overload and water retention related to the renal failure.
- Potassium is severely depleted, which is likely related to the nausea and vomiting
- The low chloride is due to the vomiting
- The creatinine and urea are raised, indicating acute kidney injury
- The haemoglobin is significantly higher than would be expected at this stage of pregnancy, which suggests significant dehydration
- The white cell count is elevated, which may be a combination of haemoconcentration and infection
- There is thrombocytopenia, consistent with HELLP - but it could also be consumptive, eg. in the context of thrombosis or something like TTP/HUS.
- The coags are normal, which virtually excludes hepatic involvement
- The D-dimer is elevated, which might represent thrombosis and consumption (of particular interest would be cerebral venous sinus thrombosis).

Q3. A 35 year old female is 39 weeks pregnant. Her pregnancy has been complicated by hypertension and proteinuria. Her blood pressure is 160/120 mm Hg. You are called to the labour ward when she suffers a generalised ("grand mal") convulsion.

Outline your overall plan of management.

Initial management
ABC – ensure patent airway, oxygen via reservoir mask or bag-valve-mask assembly and
support ventilation as needed
Left lateral tilt
Terminate the seizure
Diazepam 5-10mg or Mg 4g IV up to 8 g
Monitors / investigations

Management of Hypertension
Hydralazine
Labetalol
(Other agents are acceptable – late in pregnancy – increasing trend to use "mainstream" agents)

Treatment of convulsions
MgSO4 bolus followed by maintenance MgSO4
(Shown to be more effective than phenytoin or diazepam in preventing recurrent seizures) Addition of Benzodiazepine / Barbiturate if recurrent seizures despite MgSO4

Planning for delivery
Brief period of resuscitation once seizures controlled.

Post partum management
Continue anti-convulsants until patient improves (diuresis, fall in BP).

Discussion
This patient was having what can be described as "severe preeclampsia". The seizure pushes her over into the eclampsia territory.
Consequently, the management should look like this:

- **Attention to the ABCS,** with management of life-threatening problems simultanous with a rapid focused examination and a brief history.
- **Airway:**
    - Assess the need for airway support in context of post-ictal unconscious state
    - Weigh benefits of intubation against risks in context of the known airway access problems associated with pregnancy

- **Breathing/ventilation**
    - Assess oxygenation and briefly examine for aspiration
    - High flow oxygen via NRBM if patient is not in need of immediate intubation
- **Circulatory support**
    - Assess cardiovascular stability
        - left lateral 30° tilt if hypotensive
    - Access with widebore cannula
- **Immediate investigations:**
    - FBC - looking for thrombocytopenia
    - LFTs - looking for HELLP, hepatic encephalopathy
    - EUC - looking for hyponatremia
    - CMP
    - Coags
    - Antiepileptic drug levels, if relevant
    - CT brain, if the patient fails to awaken
- **Specific management**
    - Antihypertensives:
        - labetalol, nifedipine or hydralazine are of equivalent benefit
        - methyldopa and sodium nitroprusside are second line agents
    - Antiepileptic therapy:
        - Loading dose of magnesium sulfate, followed by an infusion, aiming at a serum level of 2.0-3.5mmol/L
        - Diazepam and phenytoin can be considered if seziures are refractory
    - Arrange for a consultation with the obstetrician regarding the safety and practicality of immediate delivery.