OSCE

2

OSCE 2

This is a **7-minute** station.

This station is a **Standardised Case-Based Discussion**.

A 58 year old man with a known history of chronic alcohol abuse was found unresponsive at his home and lying on the ground with coffee ground vomit around him. Since then he has been intermittently agitated with ambulance officers. They ended up needing to sedate him for transport.

He is brought to your Emergency Department by an Ambulance in an altered conscious state.

His obs are as follows:
- HR: 120
- BP: 90/50
- Temp: 36
- Sats: 90% on RA
- GCS - E- 3, V - 1, M 3

The candidate's tasks are to:

- First, discuss the differential diagnosis and broad assessment.
- Interpret investigation (VBG)
- Discuss the management of this specific overdose

This OSCE will assess the following domains:

- Medical Expertise
  - Differential diagnosis and Risk Assessment 30%
  - Interpretation of Investigation - 40%
- Prioritisation and Decision Making – 30%

Prop
OSCE 2

ONLY LOOK ONCE PROMPTED BY EXAMINER

pH	7.03		(7.35 - 7.45)
pCO2	23	mmHg	(35 - 45)
pO2	141	mmHg	(80 - 100)
HCO3	6	mmol/l	(20-28)
Sats	98.3	%	(20-28)
Na	149	mmol/l	(135-145)
Cl	112	mmol/l	(95 - 105)
K	4.9	mmol/l	(3.5-5.0)
Glu	4	mmol/l	(4.0 - 7.8)
Lac	21		
BE	-23.2		

Na	149	mmol/L	(135-145)
K	5	mmol/L	(3.5-4.5)
Cl	114	mmol/L	(95-1100
Bic	8	mmol/L	(22-32)
Urea	17.3	mmol/L	(3.0-8.4)
Creat	261	mmol/L	(60-110)
GFR	22	umol/L	(>60)
Serum Alcohol	pending	mmol/L	
Serum Lactate	8	ml/min	8
Serum Osmolality	360	mosmol/Kg	(275-300)

Examiner's Script

Q1. Can you please outline your suspected differential diagnosis and INITIAL assessment ONLY of this patient. (2 minutes)

- Differentials to consider
  - Acute Alcohol intoxication
  - Acute intoxication with recreational substances
  - Toxic ingestion of regular medications
  - Head trauma
  - Hepatic Encephalopathy
  - Alcoholic Withdrawal
  - Hypoglycaemia
  - Electrolyte derangement (eg hyponatraemia, hypo/hyperK)
  - Post-ictal state
  - Meningoencephalitis
  - Sepsis from another source.

Initial assessment

- Offload in Resus
- Maintain spinal precautions given possible fall / trauma
- Support with airway manoevers, suction pharynx
- IV access with VBG, ETOH level, FBE UEC CMP LFT Coags
- Bolus IV fluid 1000ml saline or hartmans with end points
- ECG, CXR
- Collateral history from ambulance officers and family if contactable
- Check if your ED has prior history / presentations
- Check if any medication packets / bottles in vicinity at home

If candidate moves to more advanced treatment such as Intubation, medication administration etc, INTERRUPT and proceed with next question of ABG analysis.

Q2. <u>Collateral hx from ambulance officers suggests patient found next to empty bottle of anti-freeze liquid.</u> His VBG and bloods are below. Please state the key abnormalities and interpret these results. (3 minutes)

pH	7.03		(7.35 - 7.45)
pCO2	23	mmHg	(35 - 45)
pO2	141	mmHg	(80 - 100)
HCO3	6	mmol/l	(20-28)
Sats	98.3	%	(20-28)
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BOLD ONLY

Full detail of calculations such as Delta or Potassium are not required

- If candidate mentions

i. **Metabolic Acidosis,** Anion Gap = Na - (Cl + Bic) = 149 - (112+6) = 31 = HAGMA (Normal - 12)
   - Reference is 12 or less. Serum K should ideally not be used, as it's elevated by acidaemia. If it is used, the reference is 16 or less.
   - This is a HAGMA, which is consistent with EG toxicity. Other potential HAGMA causes in this patient includes high lactate from hypovolaemia / hypoxia, and uraemia.

ii. Δ Gap = Δ AG/Δ Bic = 31-12/24-6 = 19/18 = 1.05 = Pure HAGMA (<0.4-NAGMA, 0.4-0.8 - NAGMA/HAGMA, 0.8-2 - pure HAGMA, >2 - mixed)

iii. **Osmolar Gap** = Measured - Calculated = <10 (normally)
   - Calculated Osmolarity = 2Na + Gluc + Urea + 1.25 (etoh) = 2*149+4+17 = 319 (we do not have etoh conc so can calc without it)
     - 360 - 319 = 41 (normally -14 to +10)
     - **High Osmolar gap most likely due to alcohol contributing to the osmolar gap, which is consistent with EG toxicity**

iv. **Toxic alcohol poisoning** - most likely Ethylene Glycol due to the lactate gap (Gas Lactate 21 - Serum Lactate 8 = 13)

v. Alcoholic keto-acidosis

vi. **Acute renal failure** secondary to rhabdomylosis

Profound acidaemia from high anion-gap metabolic acidosis.

- Drowsiness is consistent with ethylene glycol (EG) toxicity, and develops after 1-2 hrs from ingestion.
- Patient is in hypotensive shock. This may be from hypovolaemia post vomiting, or direct myocardial toxicity of EG, esp its byproducts Ca oxalate and glycolic acid.
- Tachypnoea indicates hyperventilation in response to metabolic acidosis. Metabolic acidosis results from shock (lactic acidosis) and EG toxicity, esp 10hrs post ingestion.
- Low oximetry is a concern, as this is not a direct of effect of EG. It's obviously not due to hypoventilation, so possibilities include hypovolaemic shock and/or aspiration pneumonitis. Clear chest does not exclude aspiration.
- Lethal dose is > 1ml/kg.

The patient is still GCS 7, not maintaining their airway, hypotensive despite fluid resuscitation (80/50), HR 110, Sats 95% on 15L NRB with jaw thrust.

CXR shows right middle and lower lobe opacification suggestive of aspiration pneumonitis. Est weight 75Kg.

Please describe in detail your management of this patient. (2 minutes)

i. Pt needs intubation with haemodynamic support
ii. Further IVT to be started 1000ml saline running
iii. IV pantoprazole 40mg and IV antiemetics Ondanstron or Maxolon
iv. Commence peripheral noradrenaline infusion via large bore IV or metaraminol infusion titrated to MAP 65.
v. Sodium Bicarbonate 8.4% 1-2ml/kg
vi. Intubate patient (candidate expected to have appropriate plan A/B/C with ETT 7.5 or 8) followed by NGT.
vii. Commence Ethanol via NG tube, 3 x 40ml shots of vodka (70kg) - aim for ETOH conc serum 0.1-0,15 g/DL (1.8ml/kg of 40% ethanol)
viii. Alternatively commence Fomepizole 15mg/kg bolus then 15mg/kg BD
ix. Maintenance with 40ml shot hourly
x. Insert CVC and Arterial line, IDC – send urine for oxalate crystals
xi. IV antibiotics (accept reasonable options here)
xii. Discuss with Toxicologist early
xiii. Pyridoxine 100mg IV Q6H
xiv. Thiamine IV 100mg Q6H
xv. Disposition to ICU which can accommodate CVVHF

NOTE: exact doses for ethanol or fomepizole not required.