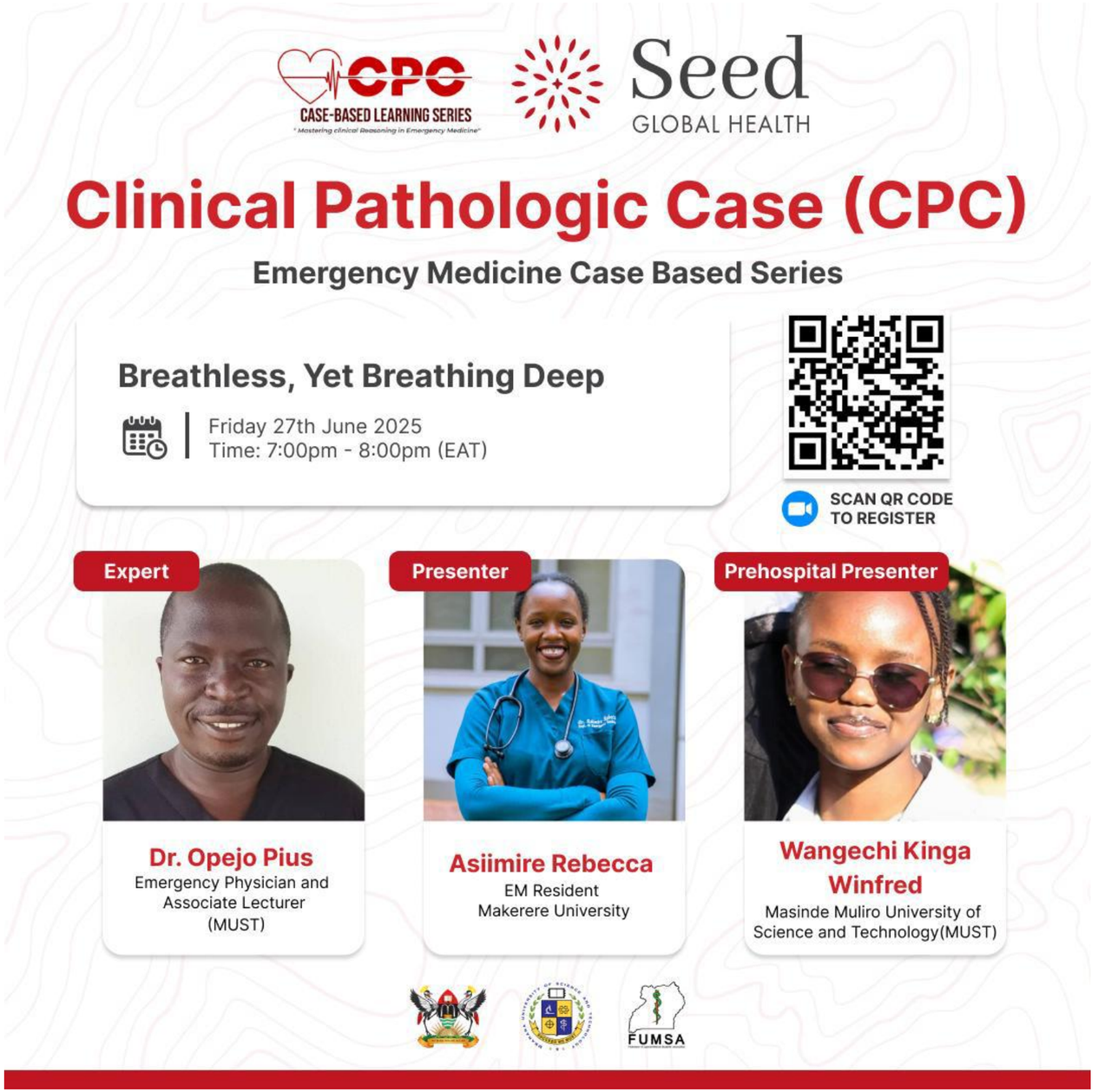
CPC CASE BASED LEARNING SERIES



Presenting Complaint

Mother calls in via Emergency Help line reporting that her 15/F is:

Seemingly harder to arouse since early that morning prior to call

lethargy for * 1 day

Vomiting for * 2days

Audience

- Any additional information?

Pre-arrival

ISBAR Report

- We have MT a 15/F presenting with hx of altered level of consciousness, vomiting and General body weakness for 2 days
- Her mother called the Emergency help line reporting that her child was seemingly harder to arouse. She has been vomiting over the past 2 days and gradually getting weaker.
- Assessment: Not in overt respiratory distress RR-33 SpO2-95% on RA normotensive HR- 105bpm GCS- 12/15 RBS-HIGH. We have administered 500mls of N/S which is currently running.
- We recommend continued IV fluid management, Initiation of insulin protocol , immediate labs and physician review

Expert

Dr Opeju what are your initial thoughts?

What is you preparation and approach to this patient?

PRIMARY SURVEY	FINDINGS	INTERVENTION
AIRWAY	Patent , no foreign bodies or secretions however at risk due to AMS	Elevated HOB, nursed in left lateral position clean and suction secretions
BREATHING	RR-35 (kussmaul pattern) SP02- 95% Symmetrical moving with respiration. Trachea is centrally located. Vesicular bilateral breath sounds heard on auscultation	Monitor Oxygen sats
CIRCULATION	BP 105/50 PR 144 CRT3 secs cold extremities Hs1+2 @ normal	Started Iv fluids- 10mls/kg (420mls), blood samples , ecg and echo* severely dehydrated and in shock
	Started Iv short acting Insulin infusion at 4.2 IU per hour Potassium 20mmols start	

PRIMARY SURVEY	FINDINGS	INTERVENTION
DISABILITY	GCS-11/15 pearl neck soft RBS-” HIGH”.	Started Iv short acting Insulin infusion at 4.2 IU per hour Potassium 20mmols start
CIRCULATION	febrile temp 37.8 noted shirt and face have vomitus, no signs of rash or skin lesions on the body however skin and mucous membranes are dry and flaky with slow skin pinch of >2 secs	IV Paracetamol for fever, Monitor temp,

Secondary survey

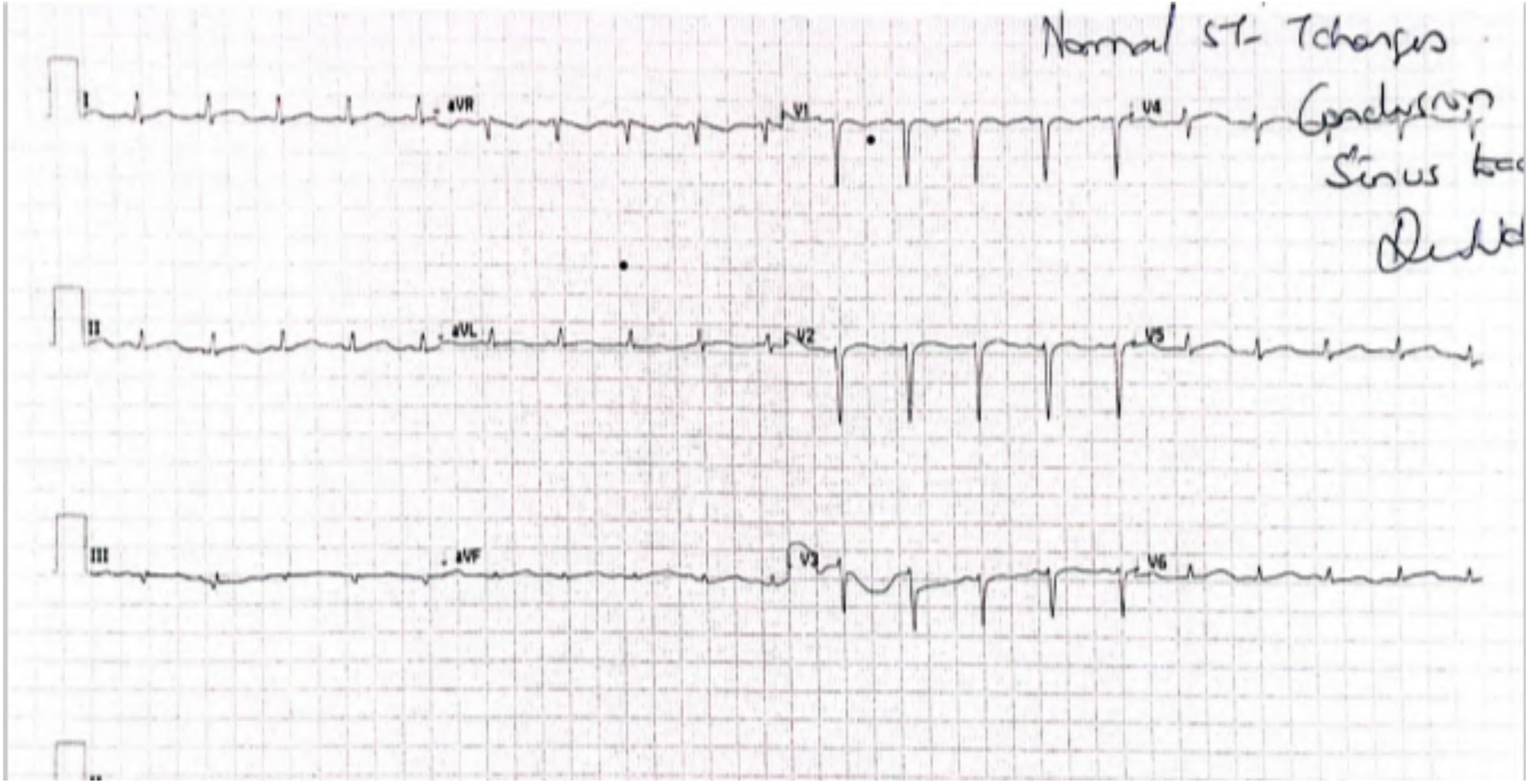
- **Head and Neck**: Sunken eyes noted.
- **Abdomen**:. Mild epigastric tenderness.
- **MSK**: Grossly normal findings.
- **Neurological:** Conscious but lethargic (GCS 12/15). Neck soft, (PEARL), no cranial nerve deficits. Normal reflexes, power, and tone in all limbs.
- **Skin**: No rash or striae; normal hair distribution.

Skin turgor >2 secs


HISTORY

DIFERENTIAL	REASON
HYPOVOEMIC SHOCK	• Cold extremeties • Crt 3 secs • PR>100 thin volume pulse • Altered mental status • Dry mucous membranes • Sunken eyes
DIABETIC KETOACIDOSIS	• Hyperglycemia • Urinary ketones • Acidosis? Clinical –kusmmaul breathing • 3Ps • +ve family hx of DM
SEPSIS	Fever Tachypnea Tarchycardia Altered mental status
GASTROENTERITIS	Vomitting Nausea Fever

DIFFERENTIAL	REASONS
SEVERE MALARIA	Fever Vomiting Ruled out with negative B/S
URINARY TRACT INFECTIONS	Increased urinary habits Fever
PANCREATITIS	Abdominal pain Vomiting fever
ELECTROLYTE IMBALANCES	Altered Mental status DM- hyper/hypokalemia- K-3.2 hypo/hypernatremia
PREGNANCY?	


Normal ST- T changes
I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6

ED COURSE

Labs

CHEMISTRY

- Na- 132
- ***K -3.2***
- Cr- 1.3
- Ph -0.97
- Mg-1.2
- Cca 2.84
- Cl-118
- LFTS- normal
- ***HBA1C- 7.5%***
- ***ABGS?***

URINALYSIS

- Protein ++ (1gm/l)
- Leuk-trace
- Ph-6.8
- ***Glu- 28mmol/l*** +++
- ***Ketones***-+++
- **HEMATOLOGY**
- CBC-8.27 Neut-5.27 PLT-250 HB- 11.8
- B/S neg
- HIV- neg
- HCG-?

Goals of Management of DKA

- **Correction of shock**
- **Correction of dehydration**
- Correction of deficits in electrolytes
- Correction of hyperglycemia
- **Correction of acidosis**
- Treatment of infection
- Treatment of complications

ED-COURSE- Fluid Management Plan

- Management of shock- Gave 2 boluses of fluids at 10mls/kg

- Maintenance fluids 100:50:20 = 1000+500+440= 1940mls

- Fluid deficit for severe dehydration= 4200mls to be corrected over 48 hours:

Total fluid replacement over 48 hrs= 4200+1940=6140mls

Subtract fluids given for drug reconstitution etc

ED COURSE- Glucose control

- Our target glucose 5-12mmol/l
- Insulin can started after correcting shock state
- IF RBS< 15mmol/l we switched to D5% fluids and continued insulin infusion

If RBS is <5.5mmol/l and patient is still acidotic increase the dextrose concentration to D10%

- If it persistently continues to drop turn down insulin infusion to 0.05U/kg/hr

Hospital Course

- Consultations and reviews by pediatric endocrinologists were made
- Patient was transferred to the Pediatric Endocrine Unit
- Glucose and electrolyte monitoring continued on ward
- Complications encountered: Hypoglycemia, Cerebral Edema
- Patient was discharged on Insulin therapy alive and well

Audience

- Any additional information?
- Poll Questions?

Pearls and Pit falls

- 6-44% of children< 15 years present with type 1 diabetes and 24-82% in sub-Saharan Africa
- Diagnosis- TRIAD of diabetes
- Risk Factors? Triggers for DKA?
  - Monitoring- Hourly monitoring: vital signs , GCS, urine output glucose, insulin, fluid intake
  - 4-6 hourly: urea and electrolytes, Urine and serum ketones,ABGs
  - Complications

	ADULTS	PEDS
DEHYDRATION	Give 2L IVF over first 2 hrs	2 x Maintenance fluids Decompensated: 5-10 cc/kg boluses (repeat as needed)
K+	K+ < 3.5: Give K+, hold insulin K+ 3.5-5.3: Give K+,give insulin K+ >5.4: Start insulin	K+ <5.5 and the patient has urinated: add 40KCL to IVF
ANION GAP	Regular insulin IV until AG closed: 0.1-0.14 units/kg/hr (Bolus not needed) Subcutaneous insulin in mild DKA (0.2 units/kg)	Insulin 0.05-0.1units/kg/hr infusion (after patient has received IVF) Subcutaneous insulin in mild DKA
ADDRESS TRIGGER	Infection Iatrogenic (not enough insulin) Infraction (forgot insulin) Ischemia Infant (pregnant)	

Expert

Pearls and pitfalls

EDUCATION:

- Highlights
- QR code with resources
- https://www.rcemlearning.co.uk/reference/paediatric-diabetic-ketoacidosis/#1622731895515-e1f63bcf-a68e
- https://ajpmed.org/index.php/ajpmed/article/view/27/9
- ISPAD guidelines
- BJA guidelines
- MOH Basic Pediatric Protocols
- ASPAE 2024 Pediatric DKA guidelines