SCENARIO

Maternal Medicine -DKA

LEARNING OBJECTIVES

Recognition of the of the seriously ill patient

Diagnosis of DKA in pregnancy

Recognition of precipitating factors for DKA

Initiate emergency management of DKA

EQUIPMENT LIST

SimMom/Noelle
BP/pulse oximeter
Catheter
IV giving set/IV fluids
IVC pack
Insulin
BM /ketone machine
CTG
Blood Bottles/blood culture
Phone
Local Trust DKA Policy/prescribing charts

PERSONNEL

MINIMUM: 4
ROLES:
Midwife
Obstetric Reg/Cons
Anaesthetic Reg/Cons

FACULTY

MINIMUM: 3
Facilitator
Observer (Endocrinologist)
Debrief Lead

TIME REQUIRMENTS
TOTAL 1.5hours

Set up: 30 mins
Pre Brief: 10 mins
Simulation: 20mins
Debrief: 30mins

INFORMATION TO CANDIDATE

PATIENT DETAILS

Name: Carla McLaren
Age: 19
Weight/BMI: 60kg/21
Gestation: 36+5

Phx: Type 1 diabetes
NovoRapid 11/12/11units
Levemir 18units nocte, Aspirin
Allergies: nil

SCENARIO BACKGROUND

Location: Labour Ward

Situation: Carla presented to labour ward with a two day history of persistent vomiting. She is G2P1 previous NVD. She has missed her last three appointments in ANC. She has no known complications from her diabetes but her glucose control has been poor in this pregnancy. Her latest HbA1c was 84mmol/mol. She didn't attend her fetal echo appointment – Paediatricians have had an alert.
The fetus' growth is on the 90th Centile
She continues to vomit and her BM is 18mmol/L and her urine dipstick shows 3+ of ketones

Task: Please assess Carla and initiate a management plan

RCOG CURRICULUM MAPPING

Module 9 Maternal Medicine
Insulin dependent diabetes-complication
Insulin dependent diabetes-use of sliding scale

INFORMATION FOR ROLEPLAYERS

BACKGROUND

You play Carla McLaren, who is 19years old and 36+5 into her second pregnancy. Your first pregnancy was uncomplicated and you had a NVD at 37 weeks. You were diagnosed with Type 1 diabetes at the age of 7yrs. You do not have any complications from the diabetes but have had poor sugar control this pregnancy. You have found it difficult to get to ANC due to lack of transport and childcare and were unable to make it to the baby's heat ultrasound. You take NovoRapid 11/12/11units with meals and Levemir 18 units at night and were prescribed aspirin, which you occasionally forget.

RESPONSES TO QUESTIONS

You have been unwell for the past two days with uncontrolled vomiting.

You think you have missed you last two insulin doses.

You feel very unwell and anxious.

No allergies

Non smoker

Your daughter was unwell with gastroenteritis last week

INFORMATION TO FACILITATOR

SCENARIO DIRECTION

Recognition of unwell patient
Request senior help (obstetric consultant/ endocrinologist)
Initiation of resuscitation with ABCDE approach (STAGE 1)
When patient becomes drowsy call Anaesthetist
Aims of treatment:
Restore circulatory volume
1L 0.9% Normal saline first hour
1L over 2hours
1L over 4hours
1L 6hourly

Reduce blood glucose
Sliding Scale: IV infusion 50 units Actrapid 50mls 0.9% Normal saline
Fixed rate insulin infusion: 0.1unit/kg/hr (6units/hr) switch to variable rate when DKA resolves
Continue long acting basal insulin, if patient eating continue short acting insulin
Glucose =/< 14mmol/L add 10% dextrose to regime 2nd IVC (STAGE 3)

Correct electrolyte imbalance
K+ = 3.5-5.5 add KCl 40mmol/L fluid (STAGE 2)
Caution with rapid reduction in Na+- cerebral oedema

Investigate:
FBC, U+E, Venous Bicarb, BM, MSU, Blood Cultures, ECG
Monitor:
Hourly venous glucose/ketones/pH
2 hourly venous electrolytes (intermittent lab confirmation)
CTG

Metabolic targets:
Decrease blood ketones by 0.5mmol/L/hour
Increase venous bicarb by 3.0mmol/L/hour
Reduced blood glucose by 3.0mmol/L/hour
Maintain K+ 4.0-5.5mmol/L
Avoid hypoglycemia

Fluid balance chart
Urinary catheter
LMWH

SCENARIO DIRECTION CONT.

SCENARIO OBSERVATIONS/ RESULTS

	BASELINE	STAGE 1 O2/fluids	STAGE 2 Insulin Infusion	STAGE 3 2 hours	
RR	32	29	25	16	
chest sound	hypervent	hypervent	hypervet	normal	
SpO2	97%	98%	97%	98%	
HR	125	130	120	90	
Heart sound	tachy	tachy	tachy	Normal	
BP	100/80	90/70	95/70	100/80	
Temp	36.9 C	37.0 C	37.1 C	36.9 C	
Central CRT	4secs	4 secs	3 secs	3secs	
GCS/AVPU	A	V	V	A	

CTG Findings: no uterine activity, 135bpm, variability <5, no accelerations, no decelerations
CXR- NAD

	Baseline	Stage 1	Stage 2	Stage 3
Venous BM	18mmol/L	17mmol/L	16mmol/L	14mmol/L
Venous ketones	6mmol/L	6mmol/L	3mmol/L	0.6mmol/L
Urine Ketones	3+			
Venous Bicarb		12mmol/L	14mmol/L	18mmol/L
Venous pH		7.1	7.2	7.3
K+		3.6mmol/L	3.5mmol/L	3.7mmol/L
Na		142mmol/L	146mmol/L	148mmol/L
Cl-		100mmol/L	102mmol/L	98mmol/L
Urea		8mmol/L	7mmoml/L	6mmol/L
Creatinine		116mmol/L	108mmol/L	90mmol/L
Hb		108 g/L	104 g/L	107g/L
WBC		$21.1x10^9$/L	$22.1x10^9$/L	$20.2x10^9$/L
PLT		186	181	183
HCT		0.6L/L	0.5L/L	0.3L/L

LFTS normal

SCENARIO DEBRIEF

TOPICS TO DISCUSS

Significant Maternal and fetal mortality

Precipitating Factors

Emergency Management of DKA in pregnancy

Involvement of Consultant endocrinologist

DKA can present with lower levels of hyperglycemias in pregnancy

Serious complications of DKA

(hyperkalemia/hypokalemia, hypoglycaemia, pulmonary/cerebral oedema)

REFERENCES

D Kamalakannan, V Baskar, D M Barton, T A M Abdu. Diabetic etoacidosis in pregnancy. Postgrad J 2003; 79:454-457

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