

Hyperosmolar Hyperglycemic Non-Ketotic Syndrome (HHNS) Case Study – 2007

Gladys is a 71 year old, Caucasian American female, 58 kg, transported to the ED from a long-term care facility where she was placed post hip fracture and ORIF for rehabilitation. The patient displayed altered mental status, dehydration, incontinence, and fever precipitating the transfer. A diagnosis of hyperosmolar hyperglycemic non-ketotic syndrome was made and the patient was admitted to MICU.

Past medical history included Type II Diabetes Mellitus of 17 years duration, treated with medical nutrition therapy and oral hypoglycemic agents; hypertension; hyperlipidemia; and Stage 3 nephropathy.

Following admission to the ICU, it was noted that Gladys seemed to have weakness on her left side, and was having difficulty speaking.

Gladys' assessment:

- Poor skin turgor
- Skin dry and warm
- Decreased alertness, disoriented
- Weakness on left side
- Difficulty speaking, aphasia
- Lungs with rhonchi
- Sinus tachycardia
- Hypotension
- BP 90/58
- HR 128 bpm
- RR 32/minute
- T 102.8 F (oral)

Labs:

Hgb	10.8 gm/dl	Hct	36%
Bicarbonate	19 mEq/L	Creatinine	2.2 mg/dl
Na	122 mmol/L	BUN	39 mg/dl
K	3.9 mmol/L	Glucose	780 mg/dl
Cl	97 mmol/L	A _{1c}	8.2%
Phos	3.3 mmol/L	Serum osmolality	340 mOsm/kg
Ca	8.1 mmol/L		

ABGs on 50% FM

PH	7.5
PaO ₂	100 mm Hg
PaCO ₂	20 mm Hg
HCO ₃	7.7 mmol/L
SaO ₂	98% on 2 L

Urine

Spec grav	1.034
Ketones	4+
Leukocytes	Few
Glucose	4+
RBCs	many

Home medications:

- Metformin 500 mg PO BID
- Rosiglitazone 4 mg PO daily
- Lipitor 10 mg PO at HS
- Lisinopril 10 mg PO daily
- ASA 81 mg PO daily

1. Discuss the physiology of HHNS.

2. List the classic signs and symptoms of HHNS.

3. Discuss the lab values:

Chemistry

ABGs

Urinalysis

4. What are the potential precipitating factors for HHNS in general and specifically for Gladys?

5. Utilizing the HHNS protocol, how do you initiate insulin management for Gladys?

Hour of Infusion	Blood Glucose	Insulin Infusion Rate	Glucose Change
1	780		
2	741		
3	718		
4	659		
5	590		
6	520		
7	429		
8	371		
11	339		
12	274		
13	247		
14	258		

7. Discuss other treatments that would be initiated.

8. List the potential complications associated with HHNS.