

## **GUIDELINES IN THE TREATMENT OF HYPER OSMOLAR NON KETOTIC COMA (HONK)**

### **DEFINITION:**

HONK is defined by the presence of hyperglycaemia associated with dehydration +/- a raised sodium level in the absence of significant acidosis or ketonuria.

### **REFERRAL:**

**These patients MUST be referred to the Diabetes Team as soon as possible (Mon - Fri 9 - 5pm).**

Dr Reckless secretary: ext.: 4527

Dr Lyn Higgs: ext. 4991

Dr Robinson secretary: ext.: 4530

Dr Ward's secretary: ext. 6232

Diabetes Liaison Nurses: ext. 4198 Bleep 7721/7881 Mon - Fri 9 - 5 p.m.

Diabetes Registrars: bleep: 7021 & 7018

### **PRECIPITATING FACTORS:**

May be a presenting feature of newly diagnosed Type 2 Diabetes (Non Insulin Dependent Diabetes).

May occur in patients with previously well controlled Type 2 Diabetes when associated with intercurrent illness e.g. pneumonia.

### **INITIAL AND IMMEDIATE INVESTIGATIONS:**

#### **1. BLOOD GLUCOSE LEVELS:**

- Capillary blood glucose. NB: blood glucose meter records to maximum 27.8 mmol/l. Higher readings are denoted as 'HI' on the meter
- Laboratory blood glucose: **MUST BE SENT**. Result may be >50 mmol/l

#### **2. U&E'S**

- Sodium may be >145 mmol/l

#### **3. BLOOD GASES**

- Usually not acidotic unless other causes present; e.g. acute organ failure

#### **4. FBC**

#### **5. SEPTIC SCREEN**

- Blood cultures
- MSU: must be sent as soon as possible
- Look for other sites of infection e.g. feet
- **SCREEN BEFORE STARTING ANTIBIOTIC**

#### **6. OTHERS:**

- ECG
- Chest X - Ray
- Calcium
- LFTs

**TREATMENT:**

In patients with depressed consciousness (Glasgow coma scale <14) airways protection is vital as there is a risk of aspiration.

A naso gastric tube should be inserted.

**PATIENTS WILL REQUIRE INTENSIVE MONITORING AND MANY WILL NEED TO BE ADMITTED TO HDU OR ITU****INSULIN INFUSION**

Prepare as 1 unit per ml in 0.9% sodium chloride (e.g. 50 units Actrapid in 50 mls N/saline)

Administer by continuous IV via syringe driver according to the scale below.

**ADMINISTER INSULIN INFUSION AT 6U/HR**

These patients may be sensitive to insulin and the insulin infusion rate may need to be halved.

If glucose is falling by >10mmol/l per hour for 2 hours then the rate of insulin should be halved.

As long as subsequent measurements are improving, keep insulin infusion rate at 6u/hr.

There is no benefit from increasing the rate.

**FLUID REPLACEMENT**

Adequate IV fluid replacement is vital - most patients are fluid depleted by 5 litres or more. A typical regime would be:

Quantity of Fluid	Type of Fluid
1.5 litres in first 2 hours	0.9% saline
1 litre in next 2 hours	0.9% saline
1 litre in next 3 hours	0.9% saline
1 litre in next 4 hours	0.9% saline
1 litre in next 8 hours	5% dextrose (if glucose < 10mmo/l)

**A CVP LINE AND URINARY CATHETER** WILL BE NEEDED IN NEARLY ALL PATIENTS ESPECIALLY PATIENTS WITH A CARDIOVASCULAR HISTORY OR AGED >65 YEARS. AFTER INITIAL FLUID REPLACEMENT CVP READINGS WILL BE USED TO DETERMINE THE EXACT FLUID REPLACEMENT.

**HALF NORMAL SALINE** MAY BE USED IF THE SODIUM LEVEL IS RISING ON TWO OCCASIONS, THIS MUST BE DISCUSSED WITH THE DIABETES TEAM OR ON CALL MEDICAL REGISTRAR AS IT IS RARELY NEEDED.

**ALL FLUIDS MUST BE ADMINISTERED VIA AN INFUSION PUMP**

## ANTICOAGULATION:

Full IV anticoagulation **MUST** be instituted, due to the increased risk of venous thrombosis, unless there is strong contraindication. If abnormal neurology is present a CT scan should be performed prior to initiating anticoagulation therapy.

## POTASSIUM SUPPLEMENTS:

Await initial electrolyte results, but give 20mmol per hour after first 500mls of IV fluid and adjust dose according to subsequent serum levels. Omit if serum potassium >6 mmol/l. If serum potassium <3.5 mmol/l give 40 mmol/hr for 2 hours with repeat U & Es. Repeat as necessary.

## SODIUM BICARBONATE:

*NOT APPROPRIATE*

**ONCE BLOOD GLUCOSE LEVELS <10 MMOL/L USING ADULT INTRAVENOUS INSULIN INFUSION PRESCRIPTION CHART CHANGE TO:**

Blood Glucose mmol/l	Insulin units/hr	Additional Infusion Fluids	Additional Action
<4	0	5% dextrose	Alert Doctor if unwell or drowsy. <b>Recheck blood glucose after 30 minutes</b>
4.1 - 6.5	1.0	5% Dextrose	
6.6 - 8.9	2.0	5% Dextrose	
9.0 - 11	3.0	5% Dextrose	
11.1 - 17	4.0	0.9% Saline	Alert Doctor if blood glucose >11 mmol/l after second reading
17.1 – 28	6.0	0.9% Saline	
>28	6.0	0.9% Saline	

**GIVE FLUIDS 8 HOURLY UNLESS OTHERWISE INDICATED**

## ANTIBIOTICS:

Give routinely - e.g. IV Cefuroxime - occult infections are often common precipitants in HONK

## MONITORING THE TREATMENT OF HONK

### BLOOD GLUCOSE MONITORING (BEDSIDE)

Hourly until stabilised (usually 12 hours after admission) then reduce to 2 hourly. The optimum range is 4 - 9 mmol/l.

### SERUM:

potassium }  
glucose } 2, 4, 8, 24 hours, then as clinically indicated  
sodium }

#### BLOOD GASES:

Repeat arterial blood gases as clinically indicated.

#### CARDIAC MONITORING:

Indicated in the following situations:

Patients >45 years old

Hypertensive patients

Patients where critical fluid balance monitoring is needed (e.g. elderly/cardiac failure)

Abnormal ECG

#### ***A FLUID BALANCE CHART MUST BE MAINTAINED***

#### **RESOLUTION:**

- Resume fluids and diet as soon as patient is able
- If patient is newly diagnosed with Type 2 Diabetes start treatment with a sulphonylurea e.g. Gliclazide 40mg OD
- If patients previously diagnosed with Type 2 Diabetes restart their usual Oral Hypoglycaemic agents once intercurrent illness is settled. The appropriateness of treatment should be discussed with the Diabetes Team.
- Ensure all patients with HONK are referred to the Diabetes Team.
- Refer all patients to the Diabetes Liaison Nurse and Dietitian