

Hyponatraemia protocol 2014

Definition

Plasma Na < 135mmol/L

This reflects the concentration of Na in plasma water and tells us NOTHING about the patient's volume status.

Causes

1. Volume depletion hyponatraemia
 - Diuretics
 - GIT losses
 - Mineralocorticoid deficiency
2. Euvolaemic hyponatraemia
 - SIADH
 - Post-operative water retention
 - Hypothyroidism
 - Glucocorticoid deficiency
 - Psychogenic polydipsia (water intoxication)
3. Volume overload hyponatraemia
 - CCF
 - Cirrhosis
 - Nephrotic syndrome
 - Chronic kidney disease
4. Pseudohyponatraemia (normal or increased plasma osmolality) eg marked hyperglycaemia, hyperlipidaemia, myeloma. These are rare with modern analysers.

Clinical features

Symptoms of cerebral oedema

- Most are asymptomatic
- Mild-to-moderate
 - Lethargy
 - Nausea
 - Headache
 - Gait abnormalities
 - Muscle cramps
 - Milder forms of neurocognitive impairment

- Severe
 - Confusion
 - Seizures
 - Coma

Evaluation and diagnosis

- Assess volume status – examination of fluid status, fluid balance charts, GI losses, medications
- Assess clinical significance
 - Look for severe manifestations
 - Hyponatraemia with mild or no symptoms can be managed less aggressively
- Biochemistry
 - Plasma and urine osmolality
 - Once plasma osmolality falls to <270mosm/kg urine should be maximally dilute (<100mosm/kg), as with water intoxication. A value higher than this suggests SIADH, thiazide, volume depletion
 - Urinary Na and K
- Plasma cortisol and thyroid function if diagnosis unclear

Management

Treat the cause

Severe and/or symptomatic hyponatraemia (Na <120mmol) should be managed in a high dependency area or renal unit as there is a risk of cerebral complications and DEATH.

- ALWAYS DISCUSS THIS WITH THE CONSULTANT
- MUST MONITOR PATIENT AND SERUM SODIUM CLOSELY
- Targets for correction
 - 4-6mmol/L increase in Na sufficient to reverse the most serious manifestations of acute hyponatraemia
 - Do not correct >10mmol/L in 24hours, of >18mmol/L in 48hours, due to risk of osmotic demyelination
 - Do not correct >8mmol/L in 24hours in patient who have alcoholism, advanced liver disease, malnutrition, hypokalaemia, or Na <105mmol/L (high risk osmotic demyelination)

Volume depletion hyponatraemia

Rehydration with 0.9% saline sufficient for hyponatraemia associated with volume depletion.

- Fluid resuscitation to stabilise blood pressure.
- In haemodynamically stable patients, give 0.9% saline (normal saline) 1L over 6 hours, then REPEAT serum Na.
- Monitor serum Na every 6 hours until Na >125mmol/L

Euvolaemic hyponatraemia

Water restriction (begin 800ml/day)

Hypertonic saline (3% saline, Na 510mmol/L) may be used in severe and/or symptomatic hyponatraemia, and requires great care not to correct hyponatraemia quickly. Formulation can be found in ICU 2 (usually keep 1-3 bags at a time).

- MUST DISCUSS WITH CONSULTANT FIRST
- PATIENT MUST BE IN ICU2 OR 4S
- Start infusion of 3% saline at body weight (in kg) → in ml/hour
 - 70kg patient : infusion at 70ml/hour
 - Expect this to increase Na by 1mmol/L/hr BUT this is only a rough guide. Treatment should be focused on monitoring rather than calculated sodium deficit.
- Measure serum Na EVERY 4 hours until Na stable >125mmol/L. STOP 3% saline infusion once Na has risen by 6mmol/L.

Volume overload hyponatraemia

Restrict salt intake. Restrict water intake to 1L/day initially. Frusemide starting at 40mg or 20mg iv bolus. Monitor Na, K, and Cr.

Key points

- ALWAYS measure serum Na every 4 hours during the initial 24hours if initial Na <120mmol/L
- ALWAYS seek consultant advice
- Hypertonic saline should only be used in ICU2 and 4S

Reference

Verbalis et al Diagnosis, Evaluation, and Treatment of Hyponatremia: Expert Panel Recommendations. Am J Med 2013; 126: S1-S41