Information for Clinicians

Clinical Biochemistry Department

Hyponatraemia in primary care

Definition

Hyponatraemia is defined as sodium < 133mmol/L.
In general investigate if persistently Na < 130mmol/L.

Mild	Na 125-133 mmol/L
Moderate	Na 120-125 mmol/L
Severe	Na <120mmol/L OR mild/moderate Na level plus symptoms (will be phoned by the lab)
Significant	Symptoms of brain oedema or Acute onset

Chronic hyponatraemia: Should be assumed if the rate of Na fall is uncertain. Sodium should not be corrected rapidly to avoid osmotic demyelination syndrome.

Acute hyponatraemia: Na has fallen >10 mmol/L in <48 hours. This is significant even if symptoms are not yet apparent. It is rare and most often due to marked water intake such as with post-operative fluids, ecstasy use, marathon runners or psychogenic polydipsia**.** There is a high mortality and morbidity associated with acute onset.

Pseudohyponatraemia: Should ALWAYS be excluded.
High glucose can cause a hypertonic hyponatraemia and whilst it is a true cause of hyponatraemia it does not cause cerebral oedema.

Pseudohyponatraemia can occur due to high triglycerides (excluded automatically by the laboratory when sample lipaemic) or paraproteinaemia (excluded automatically by the laboratory when total protein >100 g/L).

Presentation

Symptoms and Signs: Na <130mmol/L is associated with a cognitive decline even when not reported by the patient.

Other symptoms include; lethargy, anorexia, nausea, agitation, dizziness, disorientation, seizures, coma.

Causes (differentiated according to fluid status)

Hypovolaemia

- Diuretics
- Vomiting / diarrhea
- Acute Kidney Injury/ Interstitial Nephritis/ Renal disease
- Addison's disease or congenital adrenal hyperplasia
- Cerebral salt wasting (due to intracranial pathology and rare)

Hypervolaemia

- Congestive cardiac failure
- Chronic liver disease
- Nephrotic syndrome
- Protein losing enteropathy

Euvolaemia

- Medications (especially thiazide or loop diuretics, ACE inhibitors, anti-depressants such as SSRI's, anti-epileptics such as carbamazepine, anti-psychotics or proton pump inhibitors).
- Chronic low salt intake
- Chronic alcoholism ("Beer potomania")
- Polydipsia
- Reset osmostats (persistent and stable hyponatraemia due to chronic illness resetting the osmostats so they respond at lower osmolality)
- Syndrome of inappropriate ADH (SiADH, see below)
- Hypothyroidism or hypopituitarism (rare)

Management

Who to admit

Admit those with:

- Symptoms
- Hypovolaemia
- When Na < 120 mmol/L

Moderate hyponatraemia (Na 120-125mmol/L) will need careful assessment. If there are any symptoms or there is a risk of the Na falling quickly admission may be appropriate. The duty biochemist is available for discussion if management is unclear.

Who can be managed in primary care

Mild hyponatraemia (Na 125-133mmol/L) and asymptomatic patients with moderate hyponatraemia can be managed in primary care.

Management in primary care

1. **Fluid status**

Assess volume status. Common causes are fluid overload from CCF or dehydration from intercurrent illnesses and correct identification will dictate treatment (see flow chart below).

Excess fluid intake is less common but would be indicated by urine osmolality <100mOsm/Kg.

2. **Medications**

If taking medication which could be the cause, stop it and repeat Na (in the next few days if significantly low or in 2 weeks if only mildly abnormal sodium).

Checking the side effect profile for all medications is advised (e.g. in *British National Formulary*) as many commonly prescribed drugs are associated with hyponatraemia.
If the medication cannot safely be stopped then discuss with the prescribing consultant.
If Na remains low after stopping medication consider an alternative cause.

3. **Check for disorders that may cause hyponatraemia**

For new cases of hyponatraemia a repeat should be arranged expediently to exclude a rapid decline that would need admission.

Test for the following conditions when clinically indicated:

- Intercurrent illnesses especially chest infections, GI disease or UTI's (can cause SiADH). If there is an acute illness, treat the cause and repeat Na in at least 2 weeks or sooner based on clinical judgement
- Renal disease (urinalysis)
- Diabetes (fasting glucose or HbA1c)
- Hypothyroidism (TFT)
- Addison's disease (8-10am Cortisol)
- CCF, liver disease or fluid overloaded states will require treatment of underlying condition.
- Myeloma (total protein, serum electrophoresis and urine Bence Jones protein) – paraproteins may cause pseudohyponatraemia, complications or treatments of myeloma can cause true hyponatraemia.
- Cancers (especially lung and GI can cause SiADH)

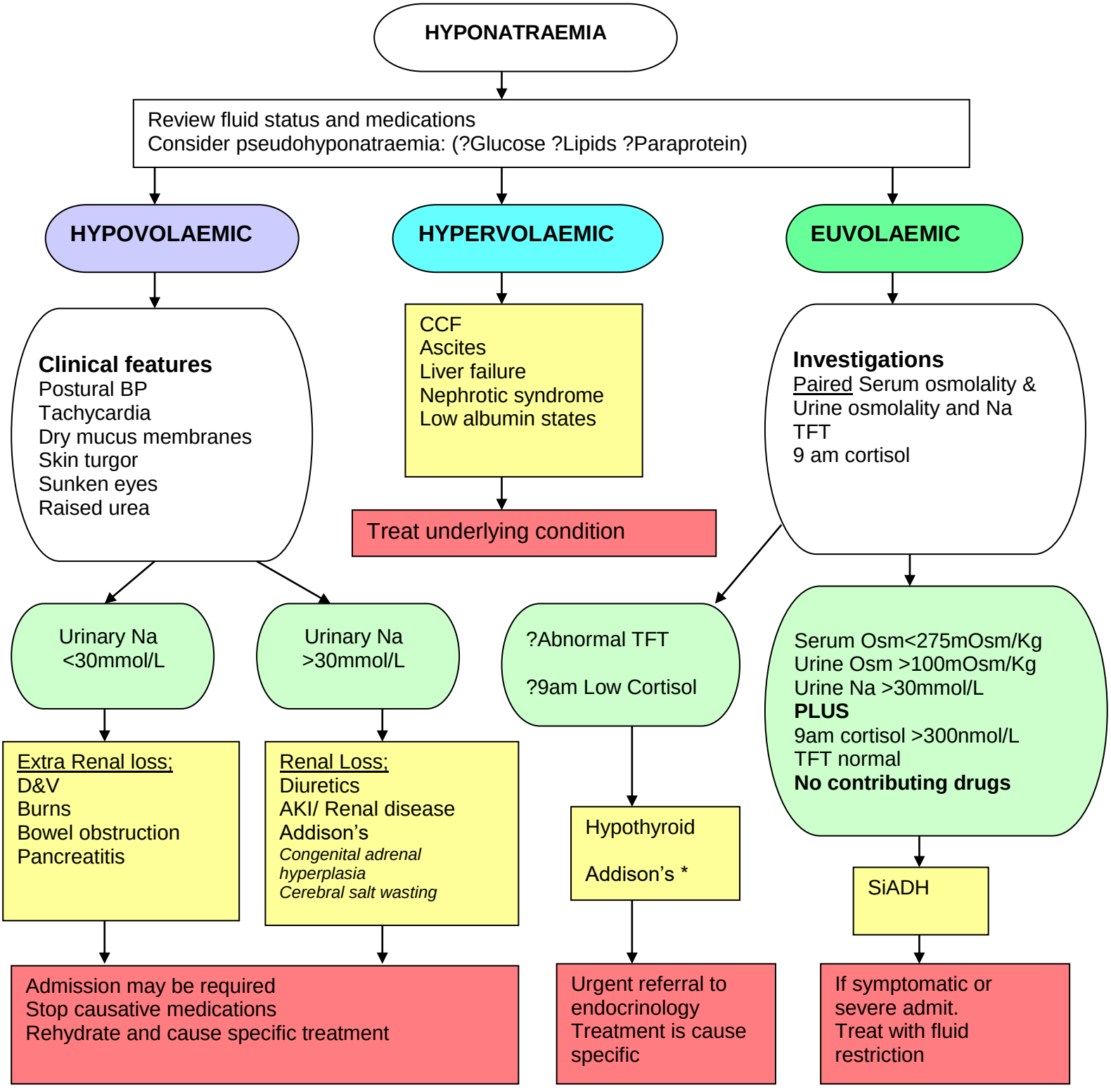
4. **Investigation panel**

If the cause is not known and there is persistent hyponatraemia then further testing is indicated. This should include the appropriate tests as mentioned above and paired urine and serum samples for sodium and osmolality. It is essential these are sent on the same day. This will help to determine the cause and therefore which treatment is required (see flowchart).

When to refer

Refer any patient in which the following is suspected:

- Endocrinology cause
- Suspected SiADH
- Cancer
- Primary polydipsia



*Addison's patients may present as euvolaemic if early in its clinical course.

SiADH

In SIADH, excessive action of ADH produces a state of water excess without major sodium retention. The expanded fluid volume cannot be detected clinically and patients appear euvolaemic, although distinguishing between euvolaemia and mild hypovolaemia is often difficult in clinical practice. Together with this clinical finding, biochemical indicators are of an inappropriately concentrated urine (>100 mosm/kg H20) or elevated urine sodium (>30 mmol/L).

Importantly, SIADH may only be diagnosed in the absence of adrenal, renal, liver, or profound thyroid dysfunction.

Causes

- medication
- respiratory disease (infections, COPD, PE)
- central nervous system disorders (infection, stroke, trauma, malignancy)
- malignancy

The likelihood of malignant disease where SIADH is present is unknown.
If a person presents with suspected malignant disease and hyponatraemia, SIADH should be suspected, and referral to the appropriate specialist via an urgent referral pathway is advised.
With unexplained SIADH, where malignancy has been excluded, a referral to an endocrinologist is recommended.

The simplest method to treat SIADH is fluid restriction, aiming to reduce fluid intake to below insensible losses and urine output. Ideally, patients should reduce intake to less than 1000-500mL a day. However, this can have a major impact on patients' lives and is often difficult to achieve. Fluid restriction does not imply calorie or sodium restriction.

Reference Sources

1. Hyponatraemia in adults, GAIN Guidelines 2010
2. Clinical Knowledge summaries. NICE. Updated 2015
3. Clinical practice guideline on diagnosis and treatment of hyponatraemia. European Journal of Endocrinology. 2014.
4. Hyponatraemia Treatment Guidelines, Verbalis. 2007 ; Expert panel Recommendations
5. Hyponatraemia in Primary Care. BMJ, May 2019