Hyponatraemia (Adults) in Primary Care

Definition
Hyponatraemia is a sodium < 133 mmol/l. In general investigate if persistently Na < 130 mmol/l.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Sodium Level</th>
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</thead>
<tbody>
<tr>
<td>Mild Hyponatraemia</td>
<td>Na 125-133 mmol/l</td>
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<tr>
<td>Moderate hyponatraemia</td>
<td>Na 115-125mmol/l</td>
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<tr>
<td>Severe Hyponatraemia</td>
<td>Na &lt;115 mmol/l OR mild symptoms</td>
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<tr>
<td>Significant Hyponatraemia</td>
<td>Symptoms of brain oedema or Acute onset</td>
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</tbody>
</table>

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 >10mmol/l in <48 hours and is significant even if symptoms 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 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 or paraproteinaemia.

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 / diarrhoea, Acute Kidney Injury/ Interstitial Nephritis/ Renal disease, Addison’s disease

- **Hypervolaemia**
  - CCF, Chronic liver disease, Nephrotic syndrome, protein losing enteropathy

- **Euvolaemia**
  - Medications (especially thiazides, ACEinhibitors, antidepressants, antiepileptics or proton pump inhibitors)
  - Syndrome of inappropriate ADH (SiADH)
  - Hypothyroidism or hypopituitarism, Low salt intake, Chronic alcoholism (“Beer potomania”) or Polydipsia, Reset osmostats

* Addison’s patients may present as euvolaemic if early in its clinical course.
Who to admit
• Admit those with symptoms or Na <115mmol/L or who are hypovolaemic.
• Moderate hyponatraemia (Na 115-125mmol/L) will need careful assessment. If there are any symptoms or there is a risk of the Na falling quickly admission may be appropriate. This group ideally should be discussed with the duty biochemist.

Who can be managed in primary care
• Mild hyponatraemia (Na 125-133mmol/L) and asymptomatic patients can be managed in primary care.
• All patients with new onset hyponatraemia should have a repeat Na checked after 1 week to exclude a rapidly decreasing level.

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 them and repeat Na in 1-2 weeks.
If the medication cannot safely be stopped then discuss with the prescribing consultant.
If Na remains low after stopping medication discuss with duty biochemist.
3. Check for disorders that may cause hyponatraemia
Test for the following conditions when clinically indicated:
• Intercurrent illnesses (especially chest infections, GI disease or UTI’s)
• Renal disease (urinalysis)
• 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)
• Cancers (especially lung and GI)
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 a paired urine and serum 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 polydypsia
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**HYPONATRAEMIA**

Review fluid status and medications
Consider pseudohyponatraemia
- glucose
- lipids
- paraprotein

**HYPOVOLAEMIC**

- Postural BP
- Tachycardia
- Dry mucus membranes
- Skin turgor
- Sunken eyes
- Raised urea

- Urinary Na <30mmol/L

- Extra Renal loss:
  - D&V
  - Burns
  - Bowel obstruction
  - Pancreatitis

Admission may be required
Stop causative medications
Rehydrate and cause specific treatment

**HYPERVOLAEMIC**

- CCF
- Ascites
- Liver failure
- Nephrotic syndrome
- Low albumin states

- Urinary Na >30mmol/L

- Renal Loss:
  - Diuretics
  - AKI/ Renal disease
  - Addison's
  - Congenital adrenal hyperplasia

- ?Abnormal TFT
- ?9am Low Cortisol & Urine Na >30mmol/L ?

- Hypothyroid
- Addison’s

- Urgent referral to endocrinology
- Treatment is cause specific

**EUVOLAEMIC**

- UE, TFT, 9 am cortisol
- Paired Serum osmolality
AND Urine osmolality & Na

- Plasma Osm <275mOsm/Kg
- Urine Osm >100mOsm/Kg
- Urine Na >30mmol/L
- 9am cortisol >350nmol/L
- TFT normal
- No contributing drugs

- SiADH

- Admit if symptomatic or severe.
- Treat with fluid restriction
* Addison’s patients may present as euvoalaemic if early in its clinical course.

References

1. Hyponatraemia in adults, GAIN Guidelines 2010
4. Hyponatraemia Treatment Guidelines, Verbalis. 2007 ; Expert panel Recommendations
5. Up to Date , Treatment of hyponatraemia.