Hyponatraemia in Primary Care

Medscape UK X Guidelines
Primary Care Hacks

Author: Dr Kevin Fernando, GP Partner, North Berwick Health Centre; Content Advisor, Medscape Global and UK. Email: kfernando@webmd.net

What Is Hyponatraemia?

- Hyponatraemia is defined as a serum sodium concentration of **<135 mmol/l**
- Hyponatraemia is often asymptomatic and found incidentally
- Clinical effects of hyponatraemia depend on **speed of onset, severity, and underlying cause**; acute hyponatraemia (onset <48 hours) is rare but often symptomatic and can cause confusion, coma, and even death
  - check for LADS signs and symptoms: **L**ethargy, **A**norexia/apathy, **D**isorientation, and **S**eizures
- An assessment of **volume status** is pivotal to the diagnosis and management of hyponatraemia
- PAI (Addison's disease) is an important diagnosis not to miss; it can be fatal if untreated
- Severe hyperglycaemia can lead to hyponatraemia; always exclude new or poorly controlled diabetes as a cause of hyponatraemia.

Causes of Hyponatraemia

Hypovolaemia

- Diuretics
- Severe hyperglycaemia and diabetes
- PAI (Addison's disease)
- Diarrhoea and vomiting (GI sodium loss)
- Sweating and extensive skin burns (transdermal sodium loss)
- Third space losses e.g. bowel obstruction, pancreatitis, severe hypoalbuminemia, sepsis, or muscle trauma

Euvolaemia

- Medication-induced or consequences of illicit drug use: amiodarone, antipsychotics, diuretics (especially thiazides), PPIs, SSRIs (especially citalopram), ACEi and ARBs, amiloride, carbamazepine, phenytoin, valproate, sulfonylureas and insulin, NSAIDs, opioids, dopamine antagonists (e.g. metoclopramide) and illicit drugs such as MDMA
- SIADH: excessive secretion of ADH causing water retention, dilution of plasma, and accumulation of intracellular fluid. It can lead to cerebral oedema, coma, and death. Can be a paraneoplastic phenomenon; many cancers result in SIADH but especially lung cancer
- Severe hypothyroidism
- Water excess (e.g. polydipsia)
- Pseudohyponatraemia is an artificially low sodium level due to hyperproteinaemia (e.g. multiple myeloma) or hypertriglyceridaemia

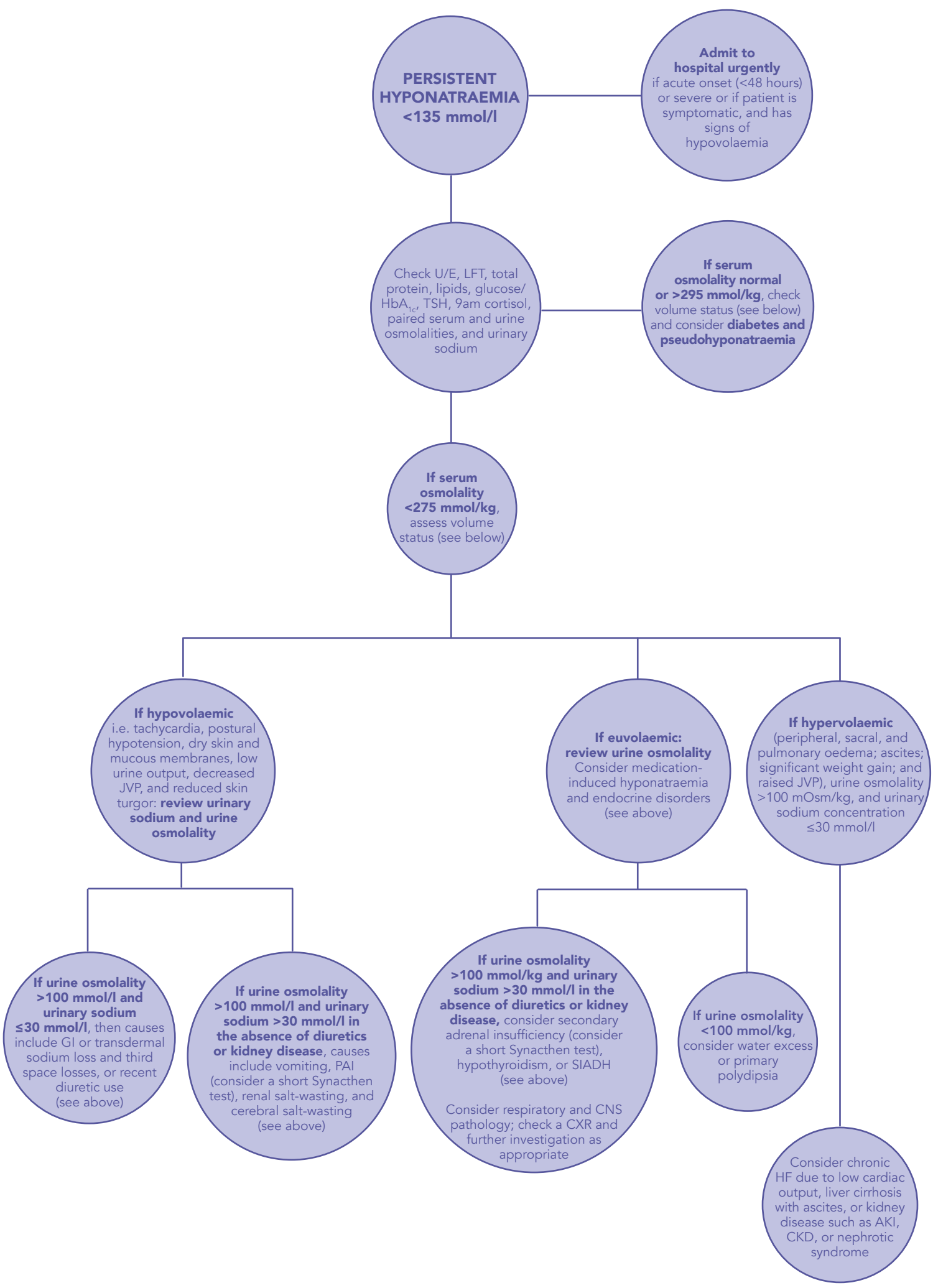
Hypervolaemia

- AKI, CKD, and nephrotic syndrome
- Liver cirrhosis with ascites
- Chronic HF due to low cardiac output.

Investigations for Hyponatraemia

- **Serum osmolality** is a measure of the concentration of different solutes in plasma and is primarily determined by sodium, glucose, and urea. NR is usually **275–295 mmol/kg** and is tightly maintained by ADH, which regulates fluid balance. An increase in serum osmolality results in secretion of ADH, which increases water reabsorption in the kidneys to return serum osmolality to baseline
- **Urine osmolality** is a measure of urine concentration and whether this is appropriate for the clinical state of the individual. It provides an estimate of ADH activity. NR is usually **300–900 mmol/kg water**. If osmolality ≤100 mOsm/kg (dilute urine), ADH is not acting. If osmolality is >100 mOsm/kg (concentrated urine), ADH is acting. After 12–14 hours' fluid restriction, urinary osmolality should be >850 mmol/kg water
- **Urinary sodium** is a measure of the concentration of sodium in a litre of urine. It is useful for the differential diagnosis of hyponatraemia but must be interpreted alongside volume status, and is therefore difficult to interpret in those taking diuretics
- **Serum urea** is a marker of **extracellular fluid volume.** A raised urea may suggest dehydration
- **Serum creatinine** is useful as an assessment of renal impairment as a cause of hyponatraemia.

Investigating Hyponatraemia



Abbreviations
ACEi=angiotensin-converting enzyme inhibitor; **ADH**=antidiuretic hormone; **AKI**=acute kidney injury; **ARB**=angiotensin receptor blocker; **CKD**=chronic kidney disease; **CNS**=central nervous system; **CXR**=chest X-ray; **GI**=gastrointestinal; **HbA_{1c}**=haemoglobin A_{1c}; **HF**=heart failure; **JVP**=jugular venous pressure; **LFT**=liver function test; **MDMA**=methylenedioxymethamphetamine; **Na**=sodium; **NR**=normal range; **NSAID**=nonsteroidal anti-inflammatory drug; **PAI**=primary adrenal insufficiency; **PPI**=proton pump inhibitor; **SAI**=secondary adrenal insufficiency; **SIADH**=syndrome of inappropriate antidiuretic hormone secretion; **SSRI**=selective serotonin reuptake inhibitor; **TSH**=thyroid-stimulating hormone; **U/E**=urea and electrolytes

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