The Investigation of Hyponatraemia in Primary Care

- Chronic hyponatraemia (Na<135mmol/L) is one of the commonest electrolyte abnormalities encountered in primary care and is frequently asymptomatic.
- Clinical effects of hyponatraemia depend on speed of onset, severity & underlying cause; acute hyponatraemia (onset <48 hours) is rare but often symptomatic and can cause confusion, coma and even death.
- An assessment of volume status is pivotal to the diagnosis & management of hyponatraemia.
- Addison’s disease is an important diagnosis not to miss as this can be fatal if untreated.
- As a rule of thumb, plasma sodium decreases by 1.6mmol/L for every 5.5mmol/L increase in glucose due to water shifts; always exclude hyperglycaemia or diabetes as a cause of hyponatraemia.

### Causes of Hyponatraemia:
- **Drugs**: Diuretics (especially thiazides), PPIs, SSRIs, ACEi & ARBs, amiloride, carbamazepine, phenytoin, sulphonylureas, opiates & recreational drugs e.g. Ecstasy.
- **CKD & nephrotic syndrome**
- **Hyperglycaemia**
- **Liver cirrhosis with ascites & HF**
- **SIADH**: Excessive secretion of ADH causing water retention, dilution of plasma & accumulation of intracellular fluid. It can lead to cerebral oedema, coma & death.
- **D&V**
- **Water excess** (e.g. polydipsia)
- **Severe hypothyroidism & Addison’s disease**
- **Pseudohyponatraemia**: Hyperglycaemia, hypertriglyceridaemia & hyperproteinaemia (e.g. myeloma).

### Investigations for Hyponatraemia
- **Serum osmolality** is a measure of the concentration of different solutes in plasma and is primarily determined by sodium, glucose & urea. Normal range is usually 275-295mmol/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.
- **Urinary osmolality** is a measure of urine concentration and whether this is appropriate for the clinical state of the individual. Normal range is usually 300-900mmol/kg water. After 12-14 hours fluid restriction, urinary osmolality should be >850mmol/kg water.
- **Urinary sodium** is useful for the differential diagnosis of hyponatraemia but must be interpreted with volume status and is 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.

### References

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**Glossary of Abbreviations**
- ADH: Antidiuretic hormone
- CKD: Chronic kidney disease
- CNS: Central nervous system
- CRT: Capillary refill time
- D&V: Diarrhoea & vomiting
- HF: Heart failure
- SIADH: Syndrome of inappropriate antidiuretic hormone

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