



Blood sodium study

Information for Local Reporters

Introduction

Sodium levels in the body are usually carefully controlled. A number of conditions can lead to extremes of sodium levels that the body cannot adjust for which requires corrective action. If high levels of sodium fall too quickly the brain can swell (cerebral oedema) and this can lead to loss of consciousness, seizures and ultimately death. Conversely if very low sodium levels rise too quickly the brain can shrink, which can lead to an intracranial catastrophe. Moreover, correcting sodium levels too quickly can lead to a devastating irreversible locked-in syndrome called Osmotic Demyelination Syndrome (ODS) which is preventable if managed in the right clinical setting with the appropriate expertise. Therefore, managing alterations in sodium concentrations can be complex and challenging.

Hyponatremia

Low sodium is classified into 3 levels, mild: Na^+ 130–135mmol/L, moderate: Na^+ 125–129mmol/L and severe: Na^+ <125mmol/L [1]. Hyponatraemia is primarily a disorder of water balance and is usually associated with a disturbance in the hormone that governs water balance, vasopressin (also called antidiuretic hormone).

Hypernatraemia

High sodium is classified as, mild: Na^+ 145-150mmol/L, moderate: Na^+ 150-155mmol/L and severe: Na^+ > 155 mmol/L. High sodium is less common than hyponatraemia but is associated with a worse prognosis and is a sign of profound water depletion.

Diabetes Insipidus

Diabetes insipidus (AVP-Deficiency or AVP-resistance), if not managed appropriately can lead to both hyponatraemia (over-treatment with desmopressin and fluids) and hypernatraemia (under-treatment).

Aims and objectives

Overall aim:

To identify and explore the avoidable and modifiable factors in the care of adults with extreme levels of sodium in hospital.

Objectives

Organisational

To review the structures and systems in place to deliver a high-quality service to patients with extreme levels of sodium.

- Acute hospital care pathways (acute medicine/ ambulatory care/ same day emergency care) and surgical admission with sodium complications
- Guidelines/ protocols in existence and use for the management of extreme sodium levels
 - Hydration policy
 - Clinical lead for IV fluid management
- Access to investigations



- Laboratory capabilities and reporting
- Involvement of specialist teams
- Multidisciplinary team working (including members of the MDT)
- Staffing
- Treatments (including variation in treatment choice)
- Current medication review
- Severity assessment
- Discharge and follow-up arrangements
- Serious adverse events
- Participation in national and local audits

Clinical

To explore remediable factors in the process of care of patients with extreme sodium levels throughout the pathway, with a focus on the following areas:

- Identification abnormal sodium levels
- Delays in diagnosis, referrals to specialists
- Access to and involvement of specialist teams
- Appropriate clinical setting
- Investigations and treatment
- Serious adverse events to highlight areas of care for improvement
- Medication management, including review of current medications
- Discharge and follow up
- Readmissions
- Examples of good practice

Methods

Participating hospitals

Hospitals in England, Wales and Northern Ireland, in which patients can be admitted/treated for abnormal blood sodium and/or hospitals that undertake elective procedures.

Population

All patients aged 18 or over who were admitted to hospital between 1st October 2023 and 31st December 2023 and diagnosed with Hypernatremia or Hyponatraemia will be included in the initial patient identification. Retrospective ICD10 coding will be used to identify patients. Patients who develop abnormal sodium levels after a procedure during the study period are also included.

The following ICD10 codes (in any position), will be used to identify patients.

E87.0	Hyperosmolality and hypernatraemia
E87.1	Hypo-osmolality and hyponatraemia
E27.2	Addisonian crisis
E23.2	Diabetes insipidus (AVP-deficiency and AVP-resistance)
G37.9	Demyelinating disease of central nervous system, unspecified

Up to 8 cases per hospital will be included for questionnaire completion and peer review.



Method of data collection

Clinician questionnaire

A questionnaire will be sent to the named consultant responsible for the patient's care during the admission. Within this there will be instruction to pass the questionnaire on to the most appropriate clinician should it not be the named person.

Data collected for the admission will include information on the treatments and investigations the patient received in hospital, the use of protocols and clinical pathways, specialist input, discharge planning and readmissions.

Hospital organisational questionnaire

Data collected will include information around the organisation of services in the process of identifying, screening, assessing, treating severe hypo- and hypernatraemia, networks of care, multidisciplinary team working, the use of guidelines/protocols and training.

Case notes

Photocopies of the case notes of each included patient will be requested at the time of questionnaire dissemination. A list detailing the required case note extracts will be circulated to local reporters. Upon receipt at NCEPOD the case notes will be anonymised removing patient identifiable information.

Reviewer assessment form

A multidisciplinary group of reviewers will be recruited to assess the case notes and questionnaires and give their opinions on the quality of care via the reviewer assessment form.

National data opt out: From the 1st August 2022, organisations in England need to comply with the national data opt-out. If you are returning a spreadsheet to NCEPOD after this date, prior to returning the data to us, please check the listed patient NHS numbers against the National spine and remove the details of any patients who have opted out.

PLEASE NOTE, BECAUSE OF GDPR REGULATIONS, WE ARE NO LONGER ABLE TO COLLECT CLINICIAN DETAILS WITHOUT CONSENT. WHEN ENTERING CLINICAL TEAM DETAILS PLEASE DO NOT ENTER CLINICIAN NAMES – PLEASE ONLY USE THE NAME/SPECIALTY OF THE TEAM OR A CLINICIAN CODE (THIS CAN BE A PAS CODE OR ANY OTHER THAT WOULD HELP YOU IDENTIFY THE CLINICIAN AND ALLOW US TO SELECT CASES ACROSS A RANGE OF CLINICIANS).

We would be grateful if you could return the **completed password protected patient identifier spreadsheet** to ncepod@nhs.net by **June 7th, 2024**. Please then phone the office with the password to open the spreadsheet.

Further information about the study and the protocol can be found on our website: <https://www.ncepod.org.uk/Bloodsodium.html> or please contact the office on **0207 251 9060** or by email at sodium@ncepod.org.uk.