⚡ Electrolyte Disorder

- Neurological aspects of electrolyte disorders
- Perioperative Management and Complications of Moyamoya Disease
- Engineered biodegradables fibres for brain metal ion regulation
- Role of disturbance coefficient in monitoring and treatment of cerebral edema in patients with cerebral hemorrhage
- Gastrodin Protects Neuronal Cells Against Oxidative Stress Through miRNA-125b-5p/Mamdc2 Axis
- Blood transfusion in percutaneous left atrial appendage occlusion: a nationwide analysis of incidence, predictors, and outcomes
- Glioblastoma targeting by water-soluble hypericin derivate HHL-PVP and photodynamic tumour killing
- The social deprivation index and deep brain stimulation: A cohort study

Definition

An electrolyte disorder is any disturbance—whether in concentration, distribution, or function—of key electrically charged minerals (electrolytes) in the body, such as sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), and phosphate (PO_4^{3-}).

These disorders may result from:

Fluid shifts (e.g., dehydration, fluid overload)

Renal dysfunction

Medications (e.g., diuretics, chemotherapy)

Hormonal imbalances (e.g., SIADH, hyperaldosteronism)

Critical illness or neurological injury

Clinical relevance

Electrolyte imbalances can:

Disrupt neuronal excitability

Alter cardiac conduction

Lead to seizures, encephalopathy, paralysis, or respiratory failure

Examples:

Hyponatraemia → cerebral edema, confusion, seizures

Hyperkalaemia → arrhythmias, muscle weakness

Hypocalcaemia → tetany, perioral numbness

Hypophosphataemia → diaphragmatic weakness, failure to wean from ventilation

Hypomagnesaemia → refractory seizures, torsades de pointes

Mnemonic: “Sick CNS? Check the ions first.”

Narrative reviews

Howard et al. [1] provide a narrative overview of the neurological manifestations associated with electrolyte disorders (Na^+, K^+, Ca^{2+}, PO_4^{3-}, Mg^{2+}), especially in critical care and neurology settings.

No original data. Lacks systematic methodology or evidence hierarchy.

Critical Review

1. Academic Repackaging Disguised as Novel Insight

This article re-sells basic textbook knowledge in a polished format, offering no original synthesis, no diagnostic algorithms, and no decision trees that a clinician might actually use. It reads like a long consultant’s memo, not a cutting-edge update for neurologists.

2. Absence of Evidence-Based Prioritization

Despite discussing life-threatening imbalances (e.g., acute hyponatraemia, hypokalemia-induced paralysis), there is no grading of urgency, no evidence tables, no clinical decision thresholds. This lack of structure renders the article practically useless in an emergency or ICU setting.

3. Didactic Tone without Clinical Sophistication

Statements like “calcium derangement can give neurological manifestations” border on vacuous generality. There's no granularity (e.g., when to order ionized calcium vs total calcium, or how to interpret magnesium in the context of renal failure). In an era of precision medicine, this is nebulous and disappointingly low-yield.

4. Neglect of Emerging Concepts and Guidelines

There is no discussion of recent guideline changes, such as:

When to use vaptans vs hypertonic saline in hyponatraemia.

Role of continuous electrolyte monitoring in neurocritical care.

Integration of AI-driven electrolyte prediction tools in EHR systems.

In short, the review feels pre-ChatGPT era—blind to digital transformation and modern clinical decision-making.

Bottom Line for the Neurosurgeon

This review is a glossy reminder of what we already know, wrapped in academic language but hollow in utility. It adds no value to daily practice, especially in neurocritical care or emergency neurology. For practical decision-making, better sources include:

UpToDate for actionable protocols.

Neurocritical Care Society guidelines.

Cochrane reviews for therapeutic thresholds.

Verdict: Educational filler with zero clinical edge. Recommendation: Not worth citing, let alone reading twice.

1)
Howard RS, Baheerathan A, Brown R, Spillane J, Waraich M. Neurological aspects of electrolyte disorders. Pract Neurol. 2025 Jun 15:pn-2023-003801. doi: 10.1136/pn-2023-003801. Epub ahead of print. PMID: 40518262.