

## Psychiatric Aspects of Hyponatremia – A Clinical Approach

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### Introduction

Presence of symptoms and signs suggestive of psychiatric illness is not pathognomonic of primary psychiatric illness. It represents a nonspecific cluster of signs and symptoms that may occur in a broad array of medical, neurologic and surgical disorders or as a consequence of substance abuse, withdrawal of drugs or pharmacologic treatment. Electrolyte abnormalities are few among others where behavioral symptoms are often contributed to psychiatric illness which is often under evaluated and go unrecognized. We will be discussing about the Psychiatric aspects of Hyponatremia.

### Clinical Features of Hyponatremia Mimicking Psychiatric Illness

Hyponatremia represents an abnormal ratio of total body sodium to water and is commonly defined as a plasma sodium concentration less than 135 mEq/L (1 mEq/L=1 mmol/L). Signs and symptoms of Hyponatremia generally do not appear until the serum sodium concentration falls below 130 mmol/L. Once the serum sodium falls below 125 mmol/L, neuropsychiatric symptoms predominate [1-3].

The clinical manifestations of hyponatremia are largely due to osmotic swelling of brain cells, resulting in neurologic and systemic symptoms [4].

- Lethargy
- Restlessness
- Disorientation
- Headaches
- Behavioral changes
- Muscular weakness
- Confusion
- Irritability
- Drowsiness
- Seizures
- Irritability
- Psychotic
- Manic behavior

### Various Relationships between Hyponatremia and Psychiatry

- Presence of Hyponatremia can lead to new onset of psychiatric symptoms.
- Presence of Psychiatric disorder can lead to new onset of Hyponatremia especially secondary to poor/excess intake of food/fluids.
- Certain Psychotropic medications can lead to new onset of Hyponatremia (e.g. SSRI drugs).

### How to Differentiate (Primary psychiatric Illness vs. Psychiatric Symptoms Secondary to Hyonatrema) in Clinical Setting?

- Sudden or Acute onset of behavioral change.
- Clouding of consciousness.
- Fluctuation in behavioral change.
- Altered Sleep Wake Cycle
- Either No past history of Psychiatric illness or even if present the presenting clinical feature not explaining the underlying Psychiatry diagnosis.
- Recent history of Vomiting, Diarrhea or other conditions where dehydration is expected.
- History of recent excessive intake of water amounting to Polydipsia.
- History of recent intake of drugs causing Hyonatrema
- History of recent surgery.

### High Risk Factors for Hyponatremia [5,6]

- Extreme old age (>80 years).
- Female gender.
- History of hyponatremia/low baseline Na concentration.
- Co-therapy with other drugs known to be associated with hyponatraemia (e.g. diuretics, NSAIDs, carbamazepine, cancer chemotherapy, calcium antagonists, angiotensin converting enzyme [ACE] inhibitors).
- Reduced renal function (glomerular filtration rate [GFR] <50 mL/minute).
- Medical co-morbidity (e.g. hypothyroidism, diabetes, chronic obstructive pulmonary disease [COPD], hypertension, head injury, congestive cardiac failure [CCF], cerebrovascular accident [CVA], various cancers).

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- Alcoholics.
- Malnourished patients.
- Hypokalemic patients.
- Burn patients.

### Recommended Management (focusing on Psychiatric aspects)

Serum sodium should be determined (at baseline and 2 and 4 weeks and then 3-monthly for those at high risk of drug-induced hyponatraemia.

- In most instances, correction of the underlying electrolyte imbalance will alleviate the psychiatric symptoms.
- Consider withdrawing other drugs associated with hyponatraemia (risk increases exponentially when antidepressants are combined with diuretics, etc.). The antidepressant should be discontinued immediately if serum sodium is <125 mmol/L (Note risk of discontinuation symptoms which may complicate the clinical picture [7-9]).
- Agomelatine is effective in older patients, is well tolerated and has not been linked to hyponatraemia [10,11].

### Antipsychotic induced Hyponatremia

- o Fluid restriction with careful monitoring of serum sodium, particularly diurnal variation.
- o There is no evidence that either reducing or increasing the dose of an antipsychotic results in improvements in serum sodium in water-intoxicated patients.
- o Consider treatment with clozapine which is shown to increase plasma osmolality into the normal range and increase urine osmolality in case of water intoxication [12,13].
- Recently introduced drugs such as tolvaptan, a so-called vaptan (non-peptide arginine-vasopressin antagonist – also known as aquaretics because they induce a highly hypotonic diuresis), and show promise in the treatment of hyponatremia of varying etiology, including that caused by drug-related SIADH [6,14,15].

### Conclusion

All patients presenting with psychiatric symptoms may not have

primary psychiatric disorder. Hyponatremia is one among various clinical conditions where patients present with psychiatric symptoms. Careful evaluation of the patient will be helpful in differentiating Psychiatric aspects of Hyponatremia from other aspects. Correction of underlying electrolyte abnormality may improve the psychiatric symptoms in majority of cases.

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