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Case Report

A Young Man with Polydipsia and Severe Hyponatremia-Successful Management with Mere Fluid Restriction: A Case Report on Psychogenic Primary Polydipsia

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Abstract:

Polydipsia as a result of an obsessive-compulsive disorder may cause polyuria and serious consequences like severe forms of electrolyte imbalance. This case report explores the rare occurrence of psychogenic primary polydipsia resulting in severe hyponatremia in a 29-year-old man presenting with excessive thirst, compulsive water intake, and extreme lethargy owing to serum hypo-osmolarity and hyponatremia. After the exclusion of organic conditions like diabetes mellitus, diabetes insipidus, hypercalcemia and, chronic kidney disease, intervention comprising of intensive counseling sessions, fluid restriction and slow normal saline infusion smoothly alleviated his presenting problems. Psychiatric management was contemplated to attain sustainable results.

Key words: polydipsia, polyuria, diabetes insipidus, primary polydipsia, psychogenic polydipsia, hyponatremia, algorithm of polyuria.

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Introduction:

Polyuria is defined as more than 3 liter urine volume in 24 hours and polydipsia is an increased thirst.

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Medical conditions like diabetes mellitus, diabetes insipidus, hypercalcemia, chronic kidney disease, use of diuretics, hyperthyroidism and, primary hyperaldosteronism commonly present with polyuria and polydipsia.[1,2]However, besides them, there are a bunch of psychiatric illnesses like schizophrenia, bipolar disorders, major depressive disorders, schizoaffective disorders, obsessive-compulsive disorders and, anxiety disorders that produce such symptoms which are labelled as psychogenic primary polydipsia (PPD). It is important to note that PPD is often seen in the context of severe mental illness and may be related to altered perceptions of thirst and fluid balance regulation.[2,3]Whatever might be the underlying cause, polyuria and polydipsia can lead to serious medical consequences like dehydration, electrolyte imbalance, renal damage, urinary tract infections, altered mentation, cardiovascular events, extreme fatigue and weakness etc.[4,5] So, it is crucial to identify and address the underlying cause to prevent and/ or manage the potential complications.

PPD characterized by excessive fluid intake leading to hyponatremia, often presenting a challenging clinical scenario.[6]In this article the authors report a case of polyuria and polydipsia with severe hyponatremia which was

successfully and smoothly corrected by fluid restrictions and normal saline infusion. It underscores the importance of recognizing psychogenic factors contributing to hyponatremia, as traditional treatments may be insufficient without addressing the underlying psychiatric components. Through an interdisciplinary approach, combining fluid management strategies with psychological interventions, authors aim to shed light on the effective and holistic management strategies for this complex condition.

Case Summary:

A 29-year-old patient presented with extreme lethargy and generalized weakness for couple of days. There was history of anorexia, nausea, and occasional vomiting since childhood, intensifying over the last two weeks. Upon further inquiry, a persistent pattern of increased thirst, copious water consumption to alleviate dryness in the mouth, and frequent day-and-night urination since childhood was revealed. He constantly felt a compulsion of drinking water. He did not take any regular medicine aside from occasional anti-histamines for allergy. He had normal salivation and lacrimation and had no previous history of diabetes mellitus. On examination, hewas a normal-looking person with no dehydration, edema, anemia, jaundice, or raised body temperature. His vital signs were stable with a pulse of 75 /min and BP of 140/80 mmHg. There were no organ enlargement, no lymphadenopathy, normal thyroid gland, and unremarkable mouth and throat. But he had whitish nails (Figure 1). Intake-output charts showed a mean total daily water intake of 11-12 liters with a mean daily urine output of 9-10 liters. Investigations revealed WBC count of 7000/cu-mm, Hb of 11.5g/dl, and normal platelet count and ESR (22 mm in the first hour). Biochemical parameters showed normal random blood glucose (7.3 mmol/L), normal serum calcium (9.79 mg/dl), normal serum creatinine (1.05 mg/dl), normal serum albumin (4.0 gm/dl)low blood osmolality (230 mOsm/kg), low urine osmolality (22 mOsm/kg), and severe hyponatremia and mild hypokalemia (sodium 114 mmol/L, potassium 3.2 mmol/L, chloride 82 mmol/L) in serum electrolytes. Urinary electrolytes were normal. He was ANA negative (titer 15.5AU/ML) and his TSH was normal (3.5 µmol/L). His chest radiograph and ECG (Figure 2) were normal but echocardiography revealed a global hypokinesia with reduced ejection fraction (45%).His abdominal ultrasound incidentally revealed cholelithiasis (Figure 3). The patient was admitted into medicine inpatient and hyponatremia was successfully managed with intensive counselling sessions and supervised fluid restriction to 3 liters per day that included an infusion with 1 liter normal saline. His serum sodium started rising to tolerable limits after 72 hours (Figure 4). Then a supervised 8-hour water deprivation was done without any remarkable discomfort, dehydration or weight loss of the patient (Figure 5). On correction of hyponatremia patient's weakness resolved. A review echocardiography showed improved myocardial function. Opinion from a psychiatrist was sought and a diagnosis of obsessive compulsive disorder was made as an underlying cause of the psychogenic primary polydipsia.

Figure 1: White nails in absence of hypo-albuminemia

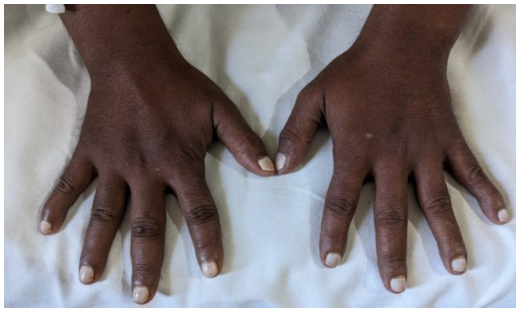


Figure 2:Unremarkable ECG with global hypokinesia on Echocardiography

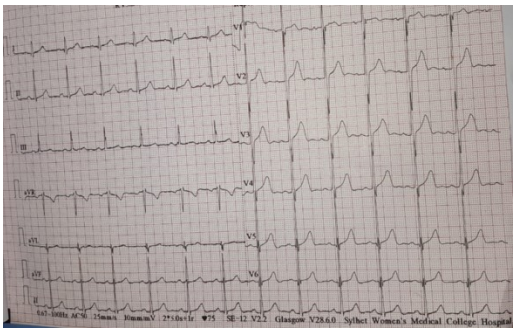


Figure 3:Ultra-sonogram of abdomen showing contracted gall bladder and cholelithiasis.

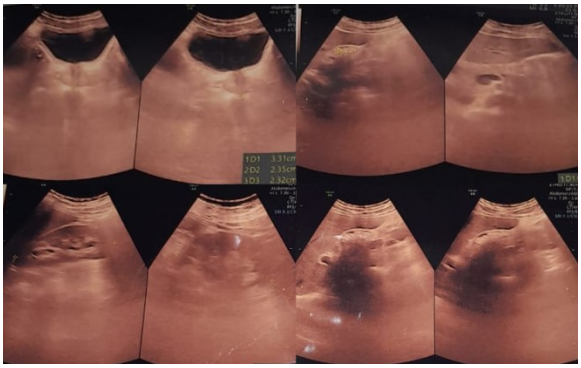


Figure 4:Timeline of hyponatremia correction

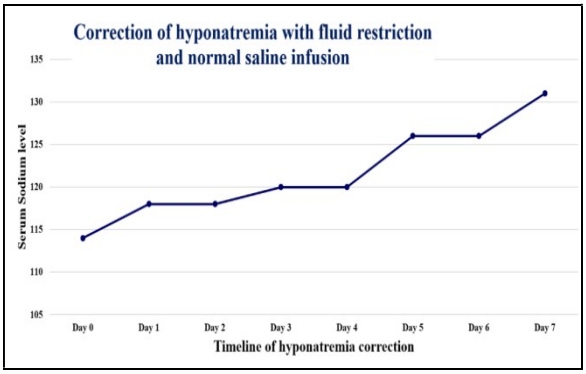
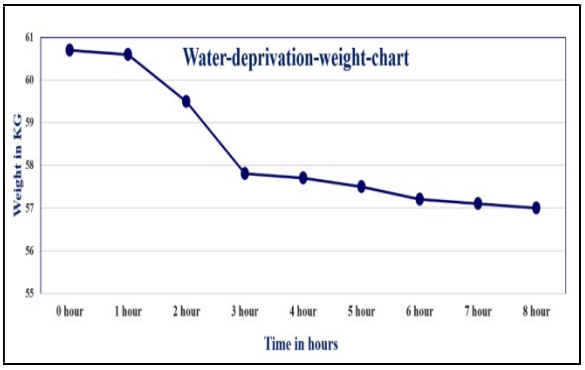


Figure 5:Weight chart after water deprivation

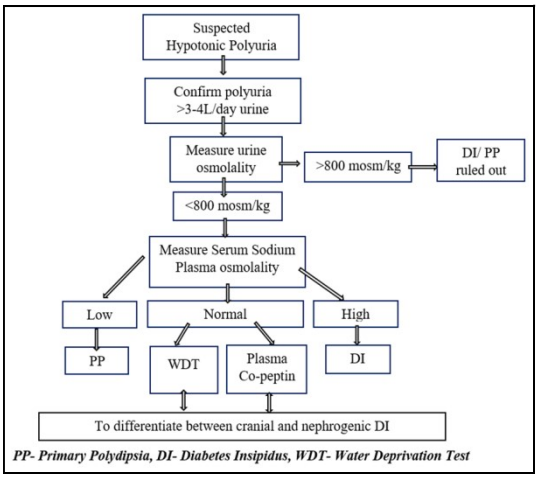


Discussion:

Primary polydipsia can be psychogenic or dipsogenic. Psychogenic primary polydipsia occurs due to an underlying psychiatric condition and it constitutes 6-20% of psychiatric admissions[7] whereas dipsogenic primary polydipsia occurs in a healthy person from consuming excessive volumes of water as a means of adopting healthy living.[1]Both the conditions can produce serious health issues specially electrolyte imbalance. Anticholinergic drugs can induce polydipsia by increasing thirst by rendering dry the oral and throat mucosa.[2,8] The prolonged history of the index case of anorexia, nausea, and occasional vomiting, coupled with recent deterioration, prompted a comprehensive investigation. Noteworthy was the revelation of a chronic pattern of excessive thirst, copious water consumption, and increased urination, indicating a potential psychogenic etiology. Absence of dehydration signs, anemia, or jaundice suggested a non-organic origin. Normal thyroid and unremarkable oral examinations ruled out endocrine or local causes. Moist tongue and normal lacrimation excluded Sjogren's syndrome.[9] Considering the low socio-economic status of the patient, an algorithm based (**Figure 6**) diagnostic approach was planned. The hyponatremia in the case aligned well with the excessive water intake pattern and, the low serum and urine osmolality combined with hyponatremia in a setting of polyuria, strongly pointed towards the diagnosis of primary polydipsia.[10]A customized 8-hour water deprivation test showed that the patient did not lose significant weight which was expected if it were a case of diabetes insipid us and so, further steps of the test with desmopressin injection were postponed.[11]

Hyponatremia correction positively impacted the patient's condition, emphasizing the importance of addressing fluid imbalances. The need for a psychiatric consultation arose due to persistent compulsive thoughts about dehydration, demonstrating the intertwined nature of physical and psychological aspects.[12] Recognition of psychogenic factors and subsequent counseling were pivotal in the holistic management approach. Advising the patient to restrict water intake showcased the significance of addressing underlying psychological components.[13] The case underscores the need for a multidisciplinary approach, combining medical and psychiatric interventions for optimal patient care. Success in managing the condition was achieved through a collaborative effort, showcasing the interconnectedness of physical and mental health.[14]

Figure 6: Algorithm of diagnosis of hypotonic polyuria[10]



In a systematic review that analyzed 22 articles, it was shown that no pharmacological treatment is of effect in PPD except for acetazolamide and high dose fluoxetine.[15] Patients with critical levels of hyponatremia may be treated with 3% sodium chloride solution but there are risks of developing central pontine myelinolysis, imparted by too rapid correction.[16] Though water restriction is the approved ideal treatment of primary polydipsia, compliance of the patient is a challenge. Trials with demeclocycline and naloxone failed to show convincing results.[1]Patients who have an underlying psychiatric illness, need to be managed with appropriate medicines. But it should be born in mind that many of the psychotropic drugs can worsen polydipsia due to anticholinergic effects of them and also due to increased production of antidiuretic hormones.[17] In obsessive-compulsive-disorder patients behavioral therapy may be presumed to improve PPD but it yielded inconclusive results in studies.[3,5,15] The index case had white discoloration of nails in absence of any family history, exposure to chemicals, fungal infection and, hypo-albuminemia. Though there might be more to explore, the researchers consider that it could be an idiopathic leuconychia.[18]

Monitoring and managing the symptoms of psychogenic polyuria and polydipsia typically involve collaboration between psychiatric and medical professionals.[1,7,19] If someone is experiencing such symptoms, seeking prompt medical and psychiatric evaluation is crucial for appropriate diagnosis and treatment.

Conclusion

This case highlights the intricate interplay between physical and mental health in the context of psychogenic primary polydipsia. The success in managing the condition stemmed from a comprehensive approach addressing both the electrolyte imbalances and the underlying psychiatric factors, underscoring the importance of a holistic patient-centered treatment strategy.

Limitations: The case report acknowledges the occasional use of anti-histamines but lacks an in-depth exploration of other potential contributing factors. Long-term follow-up and exploration of behavioral therapy modalities may provide insights into sustaining positive outcomes. Brain MRI should have been done to exclude organic lesions in hypothalamic thirst center, but could not be done due to financial constraints.

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Disclaimer: The authors of this article declare no conflict of interest

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