Hyponatremia Induced Seizure Precipitated by Post-Operative Urinary Retention and Medically-directed Polydipsia

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Background

- A 62-year-old female presented to the emergency department after a witnessed tonic clonic seizure
- This patient underwent uneventful right total knee arthroplasty two days prior to presentation
- She was in her usual state of good health prior to this event
- On post operative day two, the patient called her orthopedic surgeon with a complaint of low urine output, and she was instructed to call her primary care physician
- Her primary care physician instructed her to drink two liters of water over four hours and this was verified by the patient's husband
- Less than three hours after completing the task of drinking two liters of water, the patient had a tonic clonic seizure that was witnessed by her husband, who called EMS
- In the emergency department, it was discovered that her serum sodium was 113 mEq/L
- Her serum sodium was 134 mEq/L two weeks prior to admission
- In the emergency department, she was hemodynamically stable but was neurologically unresponsive

Case Description

- Nephrology consultation was obtained in the emergency department
- Patient was given 100 cc of 3% saline as a bolus
- Her initial labs included: normal TSH, uric acid 2.0 mg/dL(low), urine sodium 45 mg/L and urine Osmolality 247 mOsmol/kg
- This Urine OSms is consistent with SIADH
- Her CT scan of her head was unremarkable as was her portable chest ray
- PE: It was noted that she had a palpable bladder, and an indwelling urinary catheter was placed with the immediate return of over 1.5 liters of urine
- Four hours after presentation, repeat labs were done demonstrating the following: serum sodium 118 mEq/L, urine sodium 50 mg/L and urine Osmolality 46 mOsmol/kg
- The patient was started on 5% dextrose in water.
- Approximately 4 hours later, the serum sodium was 122 mEq/L. The 5% dextrose was continued
- Approximately 8 hours after presentation her serum sodium was 124 mEq/L, and she was becoming more responsive
- The 5% dextrose and serial labs were continued. At 24 hours after presentation, the serum sodium was 126 mEq/L, and the patient was neurologically intact

Discussion

- This patient had acute and severe hyponatremia induced by two compounding factors
- One, urinary retention in the post operative state likely due to her narcotic analgesics and immobility and two due to the medical instruction to drink two liters of water over four hours

Discussion

- Urinary retention has been associated with hyponatremia due to stretching of the bladder wall resulting in activation of the sympathetic nervous system and inappropriate release of anti-diuretic hormone(ADH)[1]
- This was compounded by the acute ingestion of two liters of hypotonic fluid
- Our case supports this hypothesis
- Based on her rapid correction of serum sodium and initial urinary studies suggestion the syndrome of inappropriate anti-diuretic hormone release
- After catheter placement, and the correction of the Urinary retention, Physiologic compensation occurs with, a water diuresis or a syndrome consistent with medically directed polydipsia[2]
- Her rate of correction in serum sodium was less critical as her hyponatremia was acute and not chronic[3]

Conclusion

- In the future, clinicians should consider urinary retention in the post operative period as the cause of low urine volume and not "blindly" give medical advice to ingest a large volume of water over a short period of time.
- Our patient made a full neurologic recovery and her serum sodium 48 hours after discharge was 134 mEq/L.

References

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3. Hoorn EJ, Zietse R. Diagnosis and Treatment of Hyponatremia: Compilation of the Guidelines. J Am Soc Nephrol. 2017;28(5):1340-1349. doi:10.1681/ASN.2016101139