75 year old woman with Hyponatremia

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Endorama

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History of Present Illness

- 75 yo woman who was previously healthy until the past month when she had recurrent admissions for hyponatremia and associated behavioral changes and paranoia.
  - Endocrine is consulted for hyponatremia.

History of Present Illness

- Last PCP visit (geriatrics), 7/2: Complained of L shoulder pain, prescribed physical therapy

132	96	13	87
4.8	30	0.9	

- Admission 1, 7/26-7/28: Brought in by daughter for being paranoid and withdrawn, refusing to leave the house, not eating, not sleeping.
  - Na was 125 on admission, improved with normal saline IVFs to 133 on discharge.
  - On admission: serum osm 253, urine osm 391, urine Na was 88, FeNa 0.83%, BUN 10, Cr 0.8, Cl 85.
  - Her hyponatremia was felt to be due to hypovolemia.
  - She was initially recommended inpatient psychiatric care; however, family declined. She was discharged on seroquel 12.5 mg daily.

History of Present Illness

- Admission 2, 8/8-8/16: Brought in by daughters for being withdrawn and confused.
  - Na was 121 on admission, improved to 135 after 72 hours of normal saline.
  - On admission: serum osm was 254, urine osm 304, urine Na 63, FeNa 0.53%, BUN 6, Cr 0.7, Cl 85.
  - Renal consulted: In response to normal saline, urine osm dropped to 204, felt to indicate normal ADH response to hypovolemia.
  - Na drifted back down to 127, started on NaCl 0.5 gm BID, and discharged with Na of 132.
  - Hyponatremia was then felt to be due to poor salt intake. She was treated with free water restriction of 1 L per day and salt tablets 0.5 gm BID.
  - Psychiatry also followed for episodes of catatonia. She was started on celexa 10 mg.
  - At discharge, her daughter feels that she was about 80% back to baseline.

History of Present Illness

- Current admission, 8/24: Referred from primary care clinic with Na 126.
  - Per daughter, the patient's mental status has deteriorated from being very sharp to being slowed, particularly in her speech.
  - She has had 24 hour care by family and they have been ensuring that she eats.
  - She has continued on the salt tablets.
  - One of her out-of-town daughters recently came from Kentucky to take care of the patient and had been hydrating her with 3 large bottles of water per day.
  - ROS notable for 15 lb weight loss in the past 2 months.

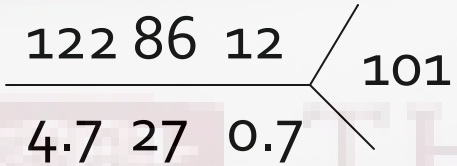
Past Medical History

- Past Medical History
  - Hypertension
  - H/o cataract surgery
  - H/o ectopic pregnancy
- Medications
  - NaCl 0.5 grams BID
  - Amlodipine 5 mg daily
  - Celexa 10 mg daily
  - Ativan 1 mg BID
  - Calcium carbonate
  - Vitamin D3
  - Vitamin E
  - Multivitamin
  - Omega 3 fish oil
- Family History:
  - No hypertension, heart disease, or cancer.
  - Sister may have had diabetes.
- Social History
  - Previously lived alone with her Pomeranian puppy.
  - Had been completely independent with IADLS and ADLs.
  - Did not use any assistive device to ambulate.
  - Divorced, widowed.
  - Has 5 children, 3 of whom live in the Chicago area.
  - Previously worked at UIC and Northwestern as an RN, retired 10 years ago.
  - Smoked 2-3 packs a week, stopped smoking after her first hospitalization.
  - Minimal alcohol use, a six-pack of beer will last her approximately 3 weeks.

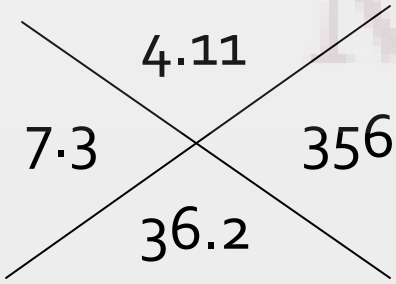
Physical Exam

- BP 169/60 | Pulse 69 | Temp 97.5 °F (Tympanic) | Resp 18 | Wt 102 lb | Ht 5'1'' | BMI 19.3 | SpO2 100%
- Constitutional: Patient appears well-developed, well-nourished, in no acute distress.
- Eyes: Conjunctivae are not injected. Sclerae anicteric. Pupils are equal, round, and reactive to light. Extraocular movements are intact.
- ENT: Mucous membranes moist.
- Neck: Supple. No thyromegaly or nodules palpated.
- Cardiovascular: Regular rhythm and rate. No murmurs appreciated. Intact distal pulses.
- Respiratory/Chest: Normal respiratory effort. No wheezes or crackles.
- Gastrointestinal/Abdomen: Normoactive bowel sounds. Soft, nontender, nondistended.
- Musculoskeletal/extremities: No peripheral edema.
- Neurological: Alert and oriented to person, place, year, president. Had difficulty answering questions directly. Had difficulty listing her children's names. Normal deep tendon reflexes.
- Skin: Skin is warm and dry. No acanthosis nigricans noted.
- Psychiatric: Did not appear anxious or paranoid.

Laboratory Results



Total protein 7.0, albumin 4.4,
Total bili 0.3, alk phos 64,
AST 15, ALT 11



Serum osm 260

Urine osm 555

Urine Na 147

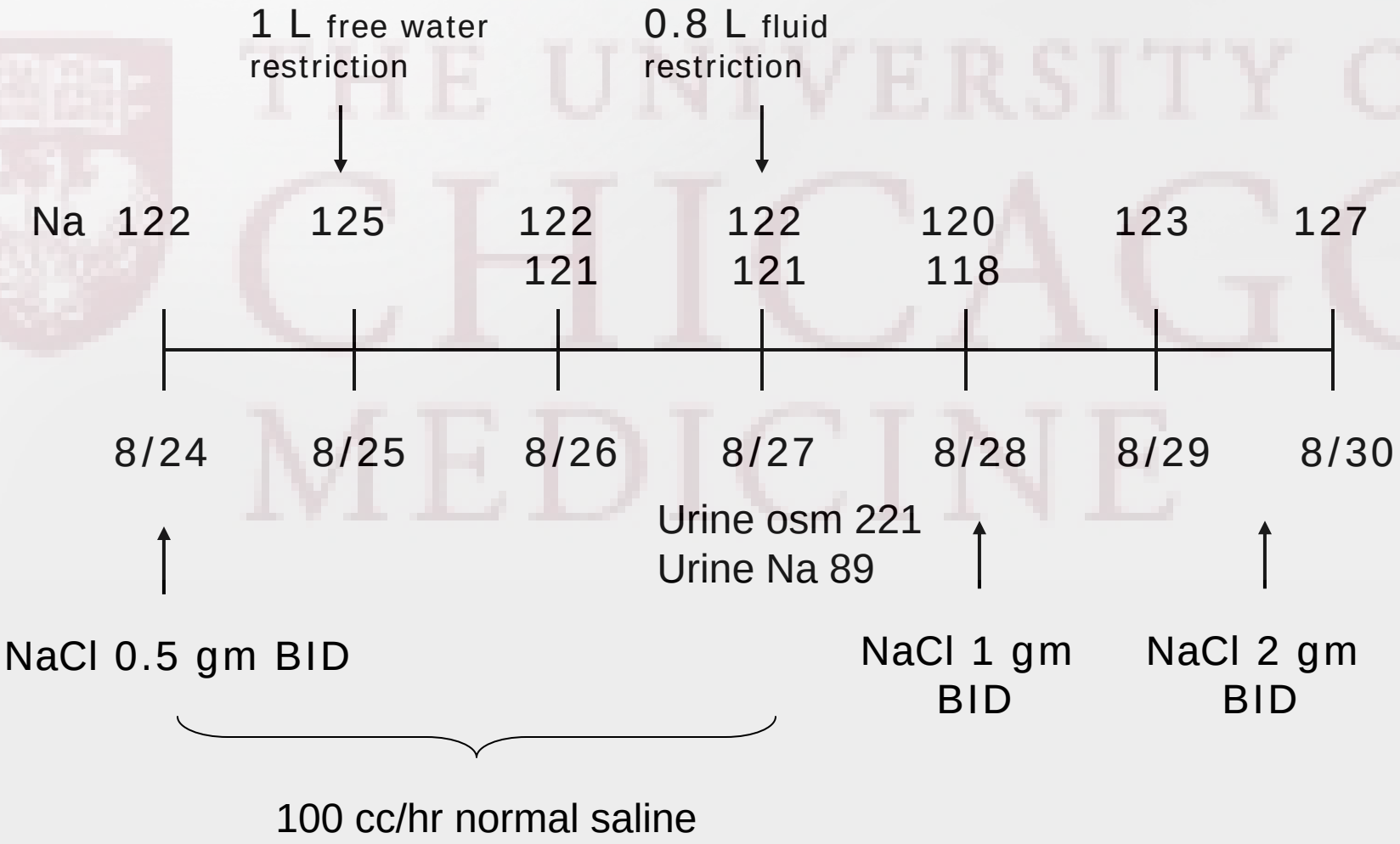
Urine specific gravity 1.015

TSH 1.12

7AM cortisol 10.4

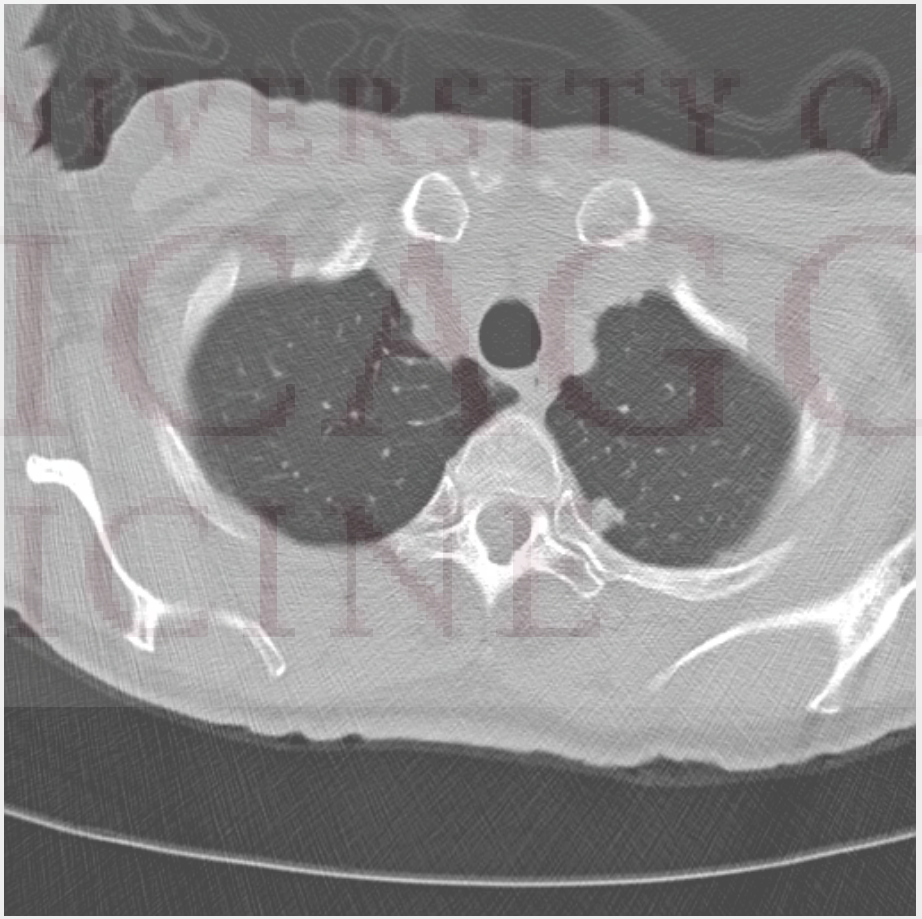
7AM cort stim: 21.7 (ACTH 58.3)→39.2→49.1

Na trend


1 L free water restriction
0.8 L fluid restriction
Na 122 125 122 122 120 123 127
121 121 118
8/24 8/25 8/26 8/27 8/28 8/29 8/30
Urine osm 221
Urine Na 89
NaCl 0.5 gm BID
NaCl 1 gm BID
NaCl 2 gm BID
100 cc/hr normal saline

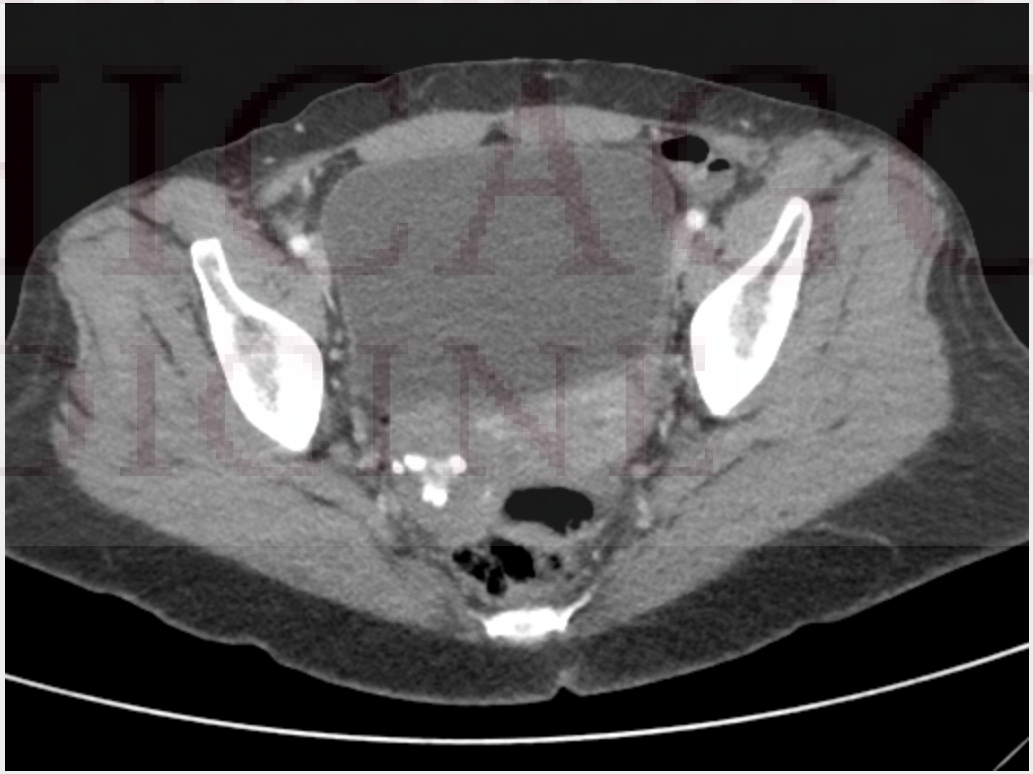
Additional Studies

- CT scan of the chest reported a stable lung nodule since 2008.
- MRI head was unremarkable.



Additional Studies

- CT abdomen/pelvis: Right adnexal 4.2 x 4.1 cm mass with calcifications. This represents ovarian neoplasm.



Assessment & Plan

- Patient is a 75 yo woman with tobacco use, stable pulmonary nodule, recent weight loss, and recent recurrent admissions for hyponatremia and associated behavioral changes and increasing paranoia. Endocrine is consulted for hyponatremia.
  - Most likely SIADH, after ruling out hypothyroidism and adrenal insufficiency.
    - TSH
    - Cort stim
  - Possible causes of SIADH:
    - SSRIs, particularly in the elderly.
    - Pulmonary nodule given her tobacco history and recent weight loss.
    - Ovarian neoplasm.
  - Discontinue citalopram.
  - Consider thoracic consult for biopsy of pleural nodule.
  - Fluid restrict to 800 cc daily.
  - Increase salt tabs to 1 gram BID. If there is no improvement, consider further increase to 2 grams BID. If there is still no improvement, would consider demeclocycline or tolvaptan.

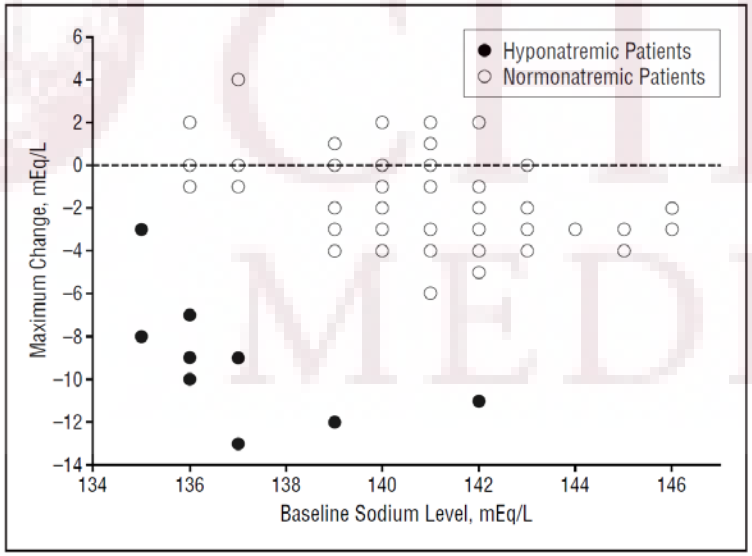
Endocrine causes of Hyponatremia

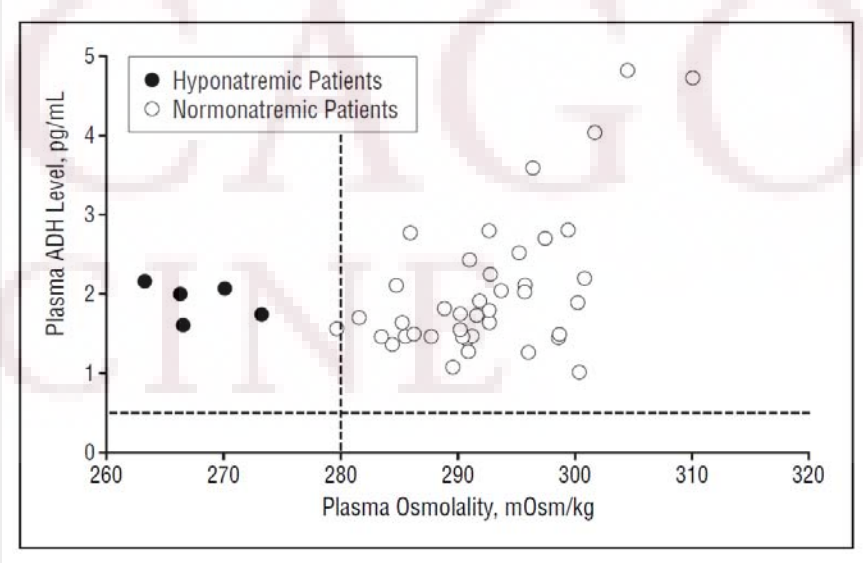
- Adrenal insufficiency
  - Reduced systemic blood pressure and cardiac output, leading to release of ADH.
  - Interrupted negative feedback loop of cortisol suppressing ADH release.
  - Aldosterone deficiency results in salt wasting and volume depletion, stimulating ADH release via carotid sinus baroreceptors.
- Hypothyroidism
  - Decreased GFR, leading to diminished ability to excrete free water (less water delivery to the diluting segments).
    - Fail to maximally dilute urine after a water load.
  - Reduced cardiac output, leading to release of ADH.
  - A study comparing 999 ambulatory patients with newly diagnosed hypothyroidism with 4875 euthyroid controls found no difference in serum sodium concentrations. Although there was a statistical correlation between higher TSH levels and lower serum sodium concentrations, the slope of the relationship was clinically negligible—10 mU/L rise in TSH to 0.14 mEq/L fall in Na.

Clin Endocrinol (Oxf). 2006 May;64(5):598-9.
http://www.uptodate.com

SSRIs and SIADH

- In a prospective study of 75 patients >62 years old who were prescribed paroxetine, 12% developed hyponatremia.
  - Mean time to develop was 9.3±4.7 days.
  - Sig. risk factors included lower BMI and lower baseline plasma sodium (<138).





- Experimental studies in rats suggest that serotonin is a potential stimulator of ADH secretion.

Arch Intern Med. 2004 Feb 9;164(3):327-32.

Malignancies and SIADH

- 15% of cases of small cell lung cancer
  - 0.7% of cases if non-small-cell lung cancer
  - 3% of patient with head and neck cancer
  - Case reportable in others
- Differential of pleural-based nodule: 106 Japanese patients
  - 53% adenocarcinomas
  - 22% inflammatory lesions
  - 17% atypical adenomatous hyperplasia
  - 5% other non-inflammatory lesions
  - 3% squamous cell carcinomas
  - No small cell lung cancers!

Sorensen et al. J Intern Med. 1995 Aug;238(2):97-110.
Hanaoka et al. Clin Imaging. 2007 Nov-Dec;31(6):385-9.

Ovarian neoplasms and SIADH: case reports

- Immature ovarian teratoma
  - 22 yo woman
    - Obstet Gynecol. 2004 May;103(5 Pt 2):1108-10.
  - 17 yo woman
    - Eur J Gynaecol Oncol. 2004;25(1):107-8.
  - 17 yo woman
    - Aust N Z J Obstet Gynaecol. 1996 Feb;36(1):104-5.
- Ovarian serous carcinoma
  - 58 yo postmenopausal woman
    - Gynecol Oncol. 1996 Sep;62(3):400-4.

Back to the patient

- Followed up in discharge clinic one day after discharge.
  - Na was 129 on 800 cc fluid restriction and NaCl 2 gms BID
- Follow up lab work 4 days later: Na 140
  - Fluid restriction reduced to 1.5L
- Plans for outpatient pelvic ultrasound, possible lung nodule biopsy.

References

- Fabian et al. Arch Intern Med. 2004 Feb 9;164(3):327-32.
- Hanaoka et al. Clin Imaging. 2007 Nov-Dec;31(6):385-9.
- Sorensen et al. J Intern Med. 1995 Aug;238(2):97-110.
- Warner et al. Clin Endocrinol (Oxf). 2006 May;64(5):598-9.
- http://www.uptodate.com