

EM Basic- Hyponatremia

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Hyponatremia- serum sodium less than 135 meq/L

- First decision point- seizing, obtunded, or altered mental status?
- If yes- go to critical care section
- If no- then DO NOTHING (well, not quite nothing but don't try to start correcting the patient's sodium level in the ED)

Symptoms- Can be vague and non-specific

- Weakness, fatigue, headache, confusion, etc.
- May be relatively asymptomatic and hyponatremia discovered during workup for something else

Usual patient- older patient with "weakness" who is alert and oriented with a sodium of 130 meq/L

- This patient accounts for the vast majority of ED patients with hyponatremia

Management- alert and oriented patient

-First step- water restrict

- Write a nursing order to make patient NPO
- Tell patient that they have to be water restricted

-Second step- investigate for whether this is acute or chronic

- Look back in the medical record
- If patient has 3 sets of labs over past 3 months with same sodium level then not that worried
- May be possible to discharge that patient if they don't need admission for something else
- If this is new for the patient then go to the next step

-Third step- investigate for possible cause of hyponatremia

- Medications are a common cause
- Hydrochlorothiazide and SSRIs are common causes
 - SSRIs- Prozac (fluoxetine), Zoloft (sertraline)
- MDMA (street drug "ecstasy") also a cause
 - Inappropriate secretion of antidiuretic hormone (ADH) leads to increase free water retention and dilution of sodium level

Causes of hyponatremia (continued)

-Volume losses

-Vomiting and diarrhea

-“Leaky fluid states”

-Severe liver disease, congestive heart failure (CHF)

-Renal failure

-Endocrine causes

-Hypothyroidism and adrenal insufficiency

-“Beer potomania”

-Excessive alcohol consumption- alcohols lack electrolytes so drinking large amounts without eating solid food can deplete sodium levels

-Cancer

-Lung cancer is notorious for causing hyponatremia

-Ask about red flags (unexplained weight loss, night sweats, unexplained bone or muscle pain, new back pain in an elderly patient)

Fourth Step- Admit the patient and DO NOTHING

*****PEARL***- Correcting the sodium too rapidly can lead to Central Pontine Myelinolysis which can cause permanent neurological damage and death**

-Don't try to correct sodium level in the ED- JUST WATER RESTRICT!

-Resist the urge to gently hydrate with normal saline- even this can raise the patient's sodium too fast

-Inpatient team may want urine electrolytes, osmols, etc.

Hyponatremia critical care- patient is seizing, altered or obtunded

-Much different patient

-Hypertonic saline to correct sodium until they stop seizing

-Only need to raise sodium about 3-5 points to do this

-Hypertonic saline

-3 mls per kilogram IV with theoretical max of 100 mls

-Rapid sequential boluses over max 10 minutes or until seizures stop

-Central access preferred but can give it through a GOOD peripheral IV (AC peripheral, not small hand vein)

Hyponatremia critical care (continued)

-Sodium Bicarbonate

- A substitute for hypertonic saline in a pinch
- Equivalent to about 11% hypertonic saline
- One amp usually is 50 mls but more Na than 3%
- One amp approx. 210 mls of 3% hypertonic saline
- Push this slower since more concentrated than 3%

-Benzodiazepenes

- Give Ativan (lorazepam) or Valium (diazepam) in case hyponatremia is not causing seizures and it is a primary seizure disorder instead

*****PEARL- If you have a patient with seizures that isn't responding to benzos, consider hyponatremia as a cause*****

-Patient with low sodium (115) but just a little altered and not seizing

- Give 3% hypertonic saline- 100 mls over one hour
- Will raise sodium by 2 points

-How much to correct the sodium safely?

- Rule of Sixes (borrowed from EmCrit, borrowed from review article)

-Six points for Severe Symptoms in then Stop

- Once you correct 6 points in 6 hours, stop until the 24 hour mark to avoid overcorrection

-Six a day makes Sense for Safety

- More for chronic hyponatremia- don't correct more than 6 points over a 24 hour period

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