



Improving Outcomes
In Heart Failure *complicated by*
HYPONATREMIA


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**Clinical Implications:
Approaches to Managing
Patients with Hyponatremia**

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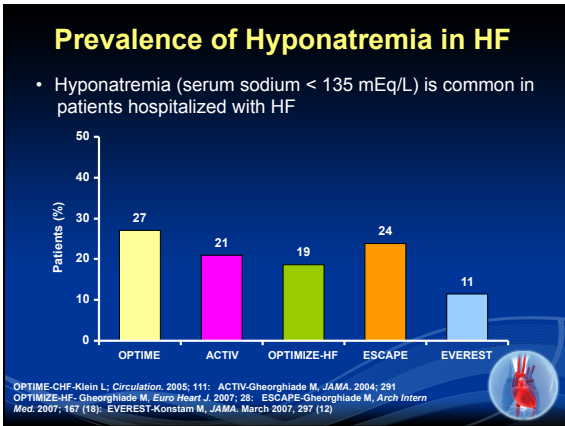
Presenter Disclosure Information

Clinical Implications: Approaches to Managing Patients with Heart Failure and Hyponatremia

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I will discuss off label use or investigational use in my presentation.
I have no financial relationships to disclose.






- ### Mechanisms of Hyponatremia in HF
- Increased non-osmotic release of AVP (2-3 fold increase in hyponatremic patients) due to low CO, decreased RBF and baroreceptor stimulation (mediated by low BP).
 - Potent thirst stimulation mediated by low CO and Angiotensin II.
 - Diuretics (Thiazides, Spironolactone, Loop diuretics)
 - Other drugs (NSAIDs, SSRIs)

- ### Hyponatremia – Clinical Presentation
- Clinical manifestations are largely due to CNS dysfunction secondary to cerebral edema.
 - Depending on rapidity and severity of hyponatremia symptoms may range from headache, nausea, vomiting, disorientation, seizures, coma, respiratory depression and death.
 - Hyponatremia is associated with falls, unsteadiness and attention deficit¹.

Treatments for Hyponatremia In Patients With HF


- Improve hemodynamics (?)
- Discontinue agents that cause hyponatremia (e.g. NSAIDs, SSRIs)
- Fluid restriction (poorly tolerated, only 1-2 mEq/L per day)
- Hypertonic saline (safety ?)
- Demeclocycline – variable results/nephrotoxic
- Vasopressin receptor antagonists

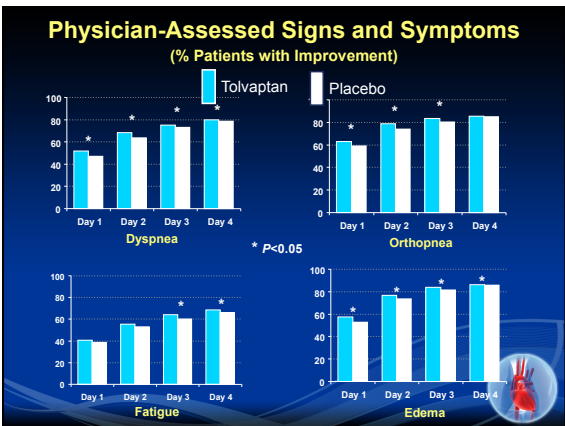


Effects of Tolvaptan in the SALT Trials

- No effect of the study drug on physical component of the SF-12 Health survey.
- There was however a significant effect on the mental component (P=0.02 for both studies)

Schrier RW, et al. *N Engl J Med.* 2006;355:2099-2112.





80 Year Old Female With Worsening HF

- Examination showed the patient to be mildly uncomfortable with BP 110/72 and P 84.
- JVP was to the angle of the jaw when she was sitting up and she had bibasilar rales.
- Extremities were warm with 1+ edema.
- Labs – Cr 1.47 mg/dL, Na+ 114 mEq/mL



Hospital Course

- Initial treatment consisted of IV bumetanide and fluid restriction.
- On hosp day 1 she diuresed 1.2 litres and was less SOB. JVP was slightly reduced.
- Na+ was 123 mEq/mL and Cr was stable.
- On hosp day 2 she diuresed only 400 ml. JVP was unchanged. Na+ was 121mEq/mL and Cr was 1.61 mEq/mL.



Treatment

- A bumetanide drip at 1 mg/h was started and tolvaptan 15 mg daily was added to her regimen.
- On Day 3 she diuresed 1.7 liters and Na+ was 124mEq/mL.
- Over the next several days she diuresed 3 liters and Na+ increased to 131 mEq/mL.
- Patient felt considerably better. She was switched to oral diuretics.
- On day day 5 tolvaptan was discontinued. Sodium remained in the 130 mEq/mL range and she was discharged with close followup.



Common Side Effects With Tolvaptan

- Thirst
- Polydipsia/polyuria
- Dry mouth
- Frequent daytime urination



Uncommon But Serious Side Effects

- Central pontine myelinolysis – caused by too rapid increase in Na⁺ concentration (>12mEq/L over 24 hours).




Management Issues

- Fall precautions during early period in hospital
- Electrolytes obtained 3x/day for first 2 days after tolvaptan started then back to 2x/day.




Clinical Implications: Approaches to Managing Patients with Hyponatremia

- Hyponatremia is common in patients with decompensated heart failure.
- Low sodium is associated with cognitive and neuromuscular impairment and increased mortality.
- Vaptans increase Na⁺ levels in hypervolemic, hyponatremic patients.
- Vaptans can improve cognitive function, enhance diuresis and improve hemodynamics.
- These agents are generally well tolerated with low SE profile.
- Effects on survival and other outcomes in hyponatremic heart failure patients are uncertain.



Clinical Implications: Approaches to Managing Patients with Hyponatremia

- Vaptans are a useful adjunct to therapy in decompensated heart failure patients with serum Na⁺ below 125 mEq/mL and in symptomatic patients with Na⁺ levels between 125 – 135 mEq/mL.



Audience Q&A

