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Management of Hyponatremia in Patients With Cirrhosis

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No financial relationships to disclose.

Background – Hyponatremia & Cirrhosis

- Definition
 - Sodium (Na) < 135 mEq/L</p>
 - In cirrhosis, Na < 130 mEq/L
 - Serum osmolality will be less than 280 mosmol/Kg
- Contributing Factors
 - Splanchnic vasodilation
 - Antidiuretic hormone (ADH)
 - Nitric oxide



Signs and Symptoms

- Frequently asymptomatic
- Mild nausea, anorexia, mild cognitive impairment, headache, gait disturbance, and fall
- Moderate confusion, muscle weakness, spasms
- Severe seizures, coma

Osmotic demyelination syndrome (ODS)

Hyponatremia and Cirrhosis

- Swift fall in sodium is associated with worse clinical outcomes in this patient population
- Reduced quality of life
- Frequent hospitalizations
- Higher incidence of liver-related complications

Morbidity and Mortality – Hyponatremia

- Independent risk factor for:
 - In-hospital mortality + 6-month mortality
 - Acute on chronic liver failure (ACLF)
 - 90-day survival
 - Bacterial infection (SBP, UTI, pneumonia)

What Is the MELD Score?

- Model for End-stage Liver Disease (MELD)
 - Developed by Russell H. Wiesner, MD in 2001
 - Total bilirubin, INR, creatinine
 - Used by UNOS to prioritize the waiting list for transplant
 - Range from 6–40
 - < 9 = too early for transplant
 - -40 = in urgent need of transplant
 - Sodium (Na) added in calculation (MELD-Na)

MELD-Na

- Changed in January 2016
- MELD-Na better predicts waitlist mortality
- Conflicts regarding post-LT survival and pre-LT hyponatrema



Hyponatremia Management

Classify Hyponatremia

- Hypovolemic
- Euvolemic (SIADH)
- Hypervolemic

Hypovolemic Hyponatremia

- 10% prevalence
- Etiology
 - Over diuresis
 - GI fluid losses (N/V/D, lactulose)
- Exam
 - Appear dehydrated
 - Dry mucous membranes, hypotensive, tachycardic, etc...

Hypovolemic Hyponatremia Treatment

- Replete fluid (crystalloids)
- Treat the underlying cause
- Hold diuretics

Hypervolemic Hyponatremia

- 90% prevalence
- Etiology
 - ↓ effective arterial blood volume 2/2 ↑ production of NO, endotoxins and other vasodilators.
 - Activation of RAA system
 - Impairment of free water excretion 2/2 excessive ADH
- Exam
 - LE edema
 - Ascites

Hypervolemic Hyponatremia Treatment

- General Measures
 - Low Na diet <2,000 mg/ day
 - Fluid restriction 1.5L/day for Na <130
 - Hold/decrease diuretics
 - Correct hypokalemia

Hypervolemic Hyponatremia Treatment

- Advanced Measures
 - Increase arterial blood volume
 - Albumin
 - Midodrine/Octreotide
 - Vaptans
 - Effective in raising Na to >135 in 4 days in 41% of pts
 - Mobilizes ascites
 - Short term, peri-transplant
 - Black box warning
 - Elevated LFTs
 - BUN predicts benefit
 - OLT eval



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