HEPATOrenal Syndrome Type I: Correct Diagnosis = Correct Management

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Disclosures

• Consultant: Merck, Vertex, Gilead, Boehringer-Ingeheim, Roche

→ None that will impact this talk today!

• Slides: My own with references noted
Objectives

After attending this case-based presentation, the participant will be able:

1. To review the often misunderstood definition and diagnostic criteria of hepatorenal syndrome type 1.

1. To accurately diagnose and differentiate between those patients who have and those who do not have hepatorenal syndrome type 1.
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DIAGNOSIS: HRS Type 1
REAL Case #1

→ Mr. T

55 year old Caucasian business man

Chronic hepatitis C with decompensated cirrhosis (ascites – on diuretics)

EC: Community acquired pneumonia (with no septic shock)
- no acute liver decompensation symptoms or signs; no ascites
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Is the AKI due to:

1) Hepatorenal syndrome Type 1

OR

2) Other causes of AKI
REAL Case#2 - Mr. ZZ

44 year old motorcycle enthusiast male

Alcoholic liver disease with decompensated cirrhosis (ascites)

EC: Tense ascites with spontaneous bacterial peritonitis (SBP)
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HEPATOREnal Syndrome - DEFINITIONS

Type 1

• a rapidly progressive, functional AKI that frequently develops in close temporal relationship with a precipitating event and occurs in the setting of deterioration in the function of other organs, including the heart, the brain, the liver, and possibly the adrenal glands.

HEPATOREnal Syndrome - DEFINITIONS

• Type 1
  – No identifiable cause of renal failure
  – Normal kidneys on renal histology

→ i.e. Diagnosis of **EXCLUSION**
HEPATOREnal Syndrome Type 1

Type 1 – Precipitating Factors

• severe alcoholic hepatitis
• Infection (e.g. SBP > UTI > sepsis)
• large-volume paracentesis without plasma expansion
• GI bleed

What is the pathogenesis of HEPATOREnal Syndrome?
HRS Pathogenesis – Multi-Organ Effects!

HEPATO → RENAL syndrome
(↑LE, ↓LFT)

NOT

RENAL → hepato syndrome!

How do you **DIAGNOSE** HEPATOrenal Syndrome Type I?
2007 International Ascites Club Revised HRS I Criteria

- Cirrhosis with ascites.
- Serum creatinine $>133$ mmol/l (1.5 mg/dl).
- No improvement of serum creatinine (decrease to a level of $\leq 133$ mmol/l) after at least 2 days with diuretic withdrawal and volume expansion with albumin. The recommended dose of albumin is 1 g/kg of body weight per day up to a maximum of 100 g/day.
- Absence of shock.
- No current or recent treatment with nephrotoxic drugs.
- Absence of parenchymal kidney disease as indicated by proteinuria $>500$ mg/day, microhaematuria ($>50$ red blood cells per high power field) and/or abnormal renal ultrasonography.

HRS Type 1 – Another Diagnostic Approach

1. Cirrhosis (decompensated with ascites)
   a. With precipitating event
   b. Elevated liver enzymes & liver dysfunction

2. Cr >133 umol/L … BUT

3. Rule out OTHER causes of AKI first
   a. Pre-renal: hypovolemia (diuretics), bleeding, shock (septic, cardiogenic, etc.)
   b. Renal: nephrotoxic drugs (e.g. NSAIDS), renal disease assoc with liver dis (GNs)
   c. Post renal obstruction
What is the Incidence of HEPATOrenal Syndrome?
HEPATORENAL SYNDROME TYPE-I: INCREASING INCIDENCE OR MISDIAGNOSIS?

Mohammad R Taheri, MD and Stephen G. Wong MD, FRCPC. Section of Hepatology, University of Manitoba, Winnipeg, Manitoba.

INTRODUCTION:

Hepatorenal syndrome (HRS) has long been recognized as a syndrome of liver failure with renal insufficiency in the setting of severe hepatic dysfunction. HRS is the most frequently fatal complication of liver disease if not treated (1). The International Ascites Club and other diagnostic criteria for HRS type-I (Table 1) have been developed to accurately diagnose HRS (2). Type-I HRS has classically been defined as a diagnosis of HRS when renal dysfunctions are present for more than 2 weeks and are not reversible. Patients with chronic liver disease and renal failure have a poor prognosis and a median survival of 6 months (3). The diagnosis of this syndrome is based on the presence of ascites, severe hyponatremia or coagulopathy, and/or greater than 15 mg/dL increase in serum creatinine. HRS responds relatively poorly to medical therapy, and recent advances in therapy have brought hope for an improved prognosis. Pharmacological treatments have been mainly supportive of HRS type-I with mixed results. Options for treatment include Midodrine and Octreotide in combination with vasopressors. The combination of Midodrine and Octreotide has been shown to improve renal function in patients with HRS type-I.

RESULTS

A total of twenty-eight charts (12 males/16 females) were reviewed. The average age of the patients was 51.2 ± 12.4 years. Eleven of 28 (39%) satisfied the 2007 criteria, while only 4/28 (14%) satisfied the older criteria. Hepatologists and/or nephrologists were consulted on 16/28 (93%) cases with diagnosis agreement of 13/28 (46%). The average treatment duration was 8.8 ± 5.5 days. Treatment success was achieved in 4/28 (14%) patients treated with Midodrine and Octreotide. Out of these four subjects, two had partial benefit with subsequent liver transplantation for cure. Figure 1 and 2 provide detailed characteristics of the patients and each separate criteria.

DISCUSSION AND CONCLUSION:

HRS is characterized by intense vasoconstriction, low glomerular filtration rate, preserved tubular function, and normal renal histology (5). The diagnostic is based on a criteria developed by international experts in 1996 which has been recently revised. One of the difficulties with the published definitions is that the exclusion criteria include shock, ongoing bacterial infection and the use of nephrotoxic agents.
hepatorenal syndrome criteria

Presence of ascitis
Serum Cr > 133
No improvement with albumin challenge
No shock
No nephrotoxic drugs used
Proteinuria > 500 mg/day
Microhematuria > 50 RBC per high power field
No abnormal Ultrasound

SATISFYING ALL 2007 CRITERIA
SATISFYING 1996 CRITERIA

11/28 (39%) Met 2007 HRS Criteria!
Diagnosed in ICU
Diagnosed in Medical Wards
ICU diagnosis satisfying criteria
Ward diagnosis satisfying criteria
Dose adjustment of medications
Alcohol related liver disease
Alcohol as a solo cause of liver disease
Consultant agreement with primary team diagnosis
Overall success rate

Only 4/28 (14%) Treatment Success
Back to our two patients ...
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Take Home Messages – HRS Type 1

1. Use the diagnostic criteria for HRS Type 1 along with liver enzyme and function to make an accurate diagnosis.

2. HRS Type 1 is mostly **PRECIPITATED** by an event that causes liver inflammation, and progressive liver enzyme and function deterioration.

3. MUST rule out other causes of AKI

1. Correct diagnosis = Correct management

→**HEPATO**renal Syndrome!