

DIALYSIS IN PATIENTS OF HEPATORENAL SYNDROME

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DEFINITION

- ⊙ International ascites club defined HRS as a syndrome that occurs in patients with cirrhosis, portal hypertension and advanced liver failure, characterized by impaired renal function with marked abnormalities in the arterial circulation and activity of endogenous vasoactive systems
- ⊙ Is a functional disorder
- ⊙ Kidneys - histologically normal

EPIDEMIOLOGY

- ◉ **Incidence:**

- ◉ 7-10% in hospitalized cirrhotics with ascites.
- ◉ 20% at 1 year, 40% at 5 years.

- ◉ **Prognosis:**

Worst prognosis of all complications of cirrhosis.

- ◉ Type 1 median survival: <2 weeks.
- ◉ Type 2 median survival: ~6 months.

CLASSIFICATION OF HRS

- ◉ **Four types-**
- ◉ **HRS type-1:** Cirrhosis with rapidly progressive acute renal failure.
- ◉ **HRS type-2:** Cirrhosis with sub acute renal failure
- ◉ **HRS type-3:** Cirrhosis with type-1 or type-2 HRS superimposed on chronic kidney disease/acute renal injury
- ◉ **HRS type-4:** fulminant liver failure with HRS

DIAGNOSTIC CRITERIA

◉ Major Criteria:

- ◉ Chronic or acute liver disease with advanced liver failure or portal hypertension.
- ◉ Low GFR (Cr > 2.5 mg/L OR CrCl < 40mL/min).
- ◉ Exclusion of shock, ongoing bacterial infection, volume depletion, and use of nephrotoxic drugs.
- ◉ No improvement in renal functions despite stopping diuretics and volume repletion with 1.5L of saline.
- ◉ No proteinuria or ultrasonographic evidence of obstruction or parenchymal renal disease.

- ◉ Minor criteria

- ◉ Urine volume <500ml/day.
- ◉ Urine sodium <10mmol/L.
- ◉ Urine osmolality > Plasma osmolality.
- ◉ Serum Na <130mmol/L.
- ◉ Urine RBC <50/hpf.

MANAGEMENT

- ⊙ The goal is to reverse renal failure and prolong survival until candidates undergo liver transplantation.
- ⊙ Pharmacologic agents can be classified into two broad categories:
 - ⊙ **Renal Vasodilators**
 - ⊙ **Systemic Vasoconstrictors**

- ◎ I. RENAL VASODILATORS:

- ◎ DIRECT renal vasodilators

- ◎ DOPAMINE :

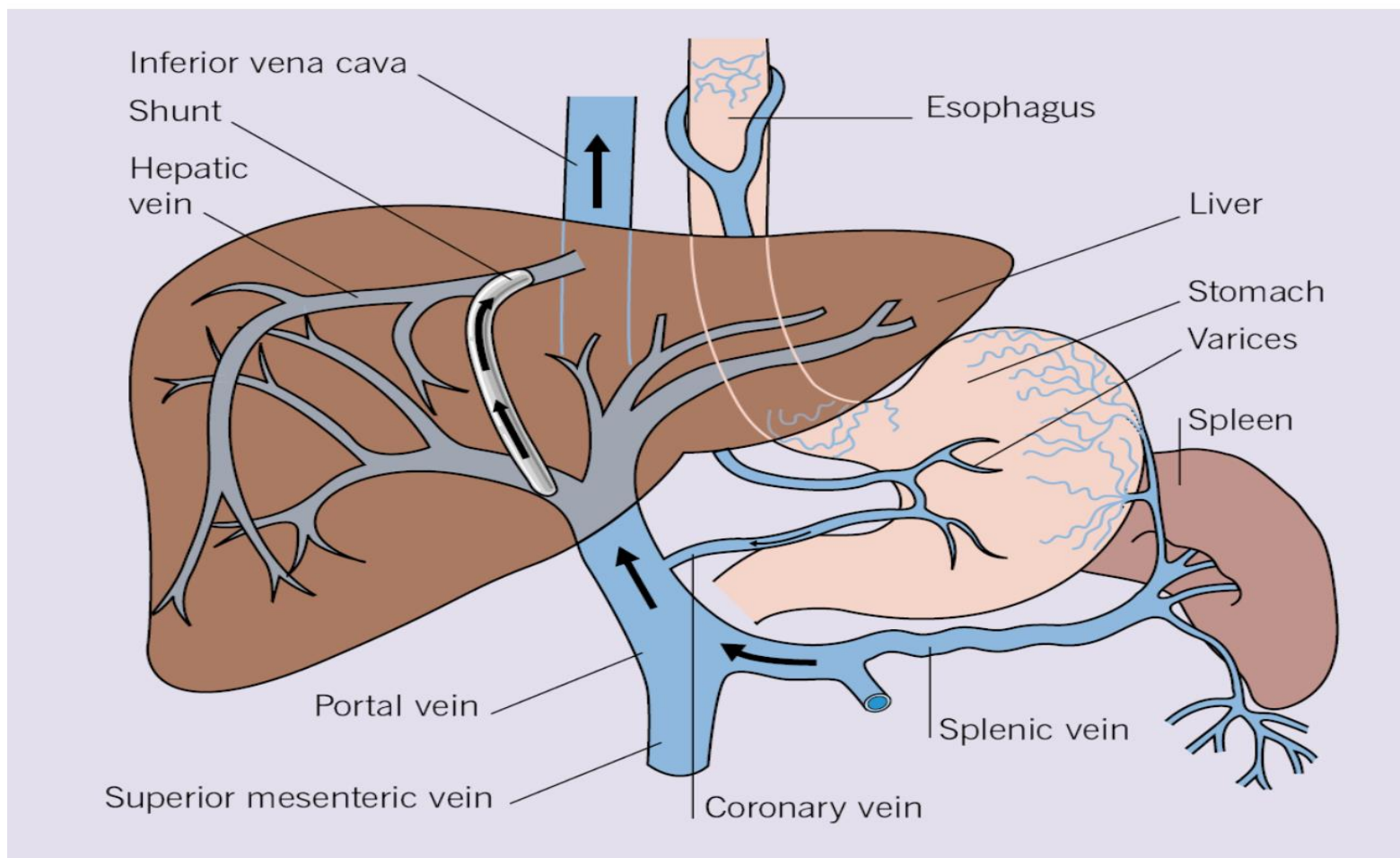
Low dose dopamine(2-5 μ gm/kg /min) is prescribed in the hope that its vasodilatory properties may improve renal blood flow.

SYSTEMIC VASOCONSTRICTORS

Interruption of splanchnic vasodilation will relieve the intense renal vasoconstriction.

- ⊙ Vassopressin Analogue - **TERLIPRESSIN**
- ⊙ Somatostatin Analogue - **OCTREOTIDE.**
- ⊙ Adrenergic Agonist - **MIDODRINE, NOREPINEPHRINE.**

TRANSJUGULAR INTRAHEPATIC PORTAL SYSTEMIC SHUNT



Successful **Liver transplantation** is the treatment of choice for HRS patients as it restores hepatic function.

**Dialysis in
hepatorenal
syndrome ???**

- ⊙ In HRS patients, who progress despite supportive care and pharmacological management, RRT might become indicated.
- ⊙ Indication for RRT include volume overload, uremia, encephalopathy, intractable metabolic acidosis and electrolyte imbalance .

Patients with Hepatorenal Syndrome Should Be Dialyzed? CON

Hani M. Wadei 

KIDNEY360 2: 410–412, 2021. doi: <https://doi.org/10.34067/KID.0006872020>

Initiation of RRT is **controversial** specially in HRS patients who are not candidates for LT especially that earlier studies documented prolonged hospital stay, higher rates of complications especially bleeding and high mortality rate in those patients after RRT initiation.

Role of renal replacement therapy in patients with type 1 hepatorenal syndrome receiving combination treatment of vasoconstrictor plus albumin

Zhiwei Zhang, Geetha Maddukuri, Navin Jaipaul, Cindy X Cai

Journal of Critical Care 30 (5), 969, 2015

Conclusions

Based on our observation, **routine use of RRT may not be beneficial** in patients with type 1 HRS receiving combination treatment of vasoconstrictor plus albumin. Further prospective studies are needed to validate these findings and refine the specific indications for RRT in this patient population.

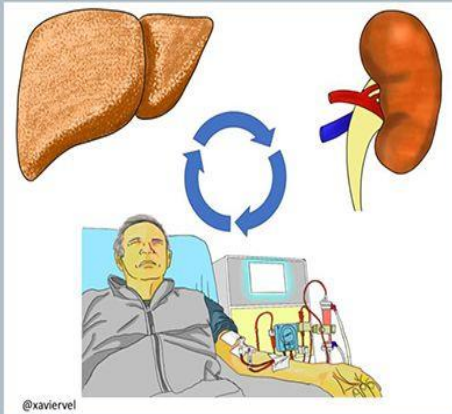
Renal replacement therapy in critically ill liver cirrhotic patients—outcome and clinical implications

Katharina Stauffer^{1,2}  | Kevin Roedl^{1,3} | Danijel Kivaranovic⁴ | Andreas Drolz^{1,3} |
Thomas Horvatits^{1,3} | Susanne Rasoul-Rockenschaub² | Christian Zauner¹ |
Michael Trauner¹ | Valentin Fuhrmann^{1,3}

Conclusions: Mortality in critically ill cirrhotics with need for RRT is substantially high independent of LT options. Only a small proportion showed renal recovery after ICU discharge. CLIF-C ACLF and CLIF-SOFA score may assist in identifying patients who would not benefit from RRT.

Prognosis of Patients With Cirrhosis and Acute Kidney Injury Who Initiate Renal Replacement Therapy

METHODS Retrospective chart review
Cirrhosis + RRT for AKI (N=472)



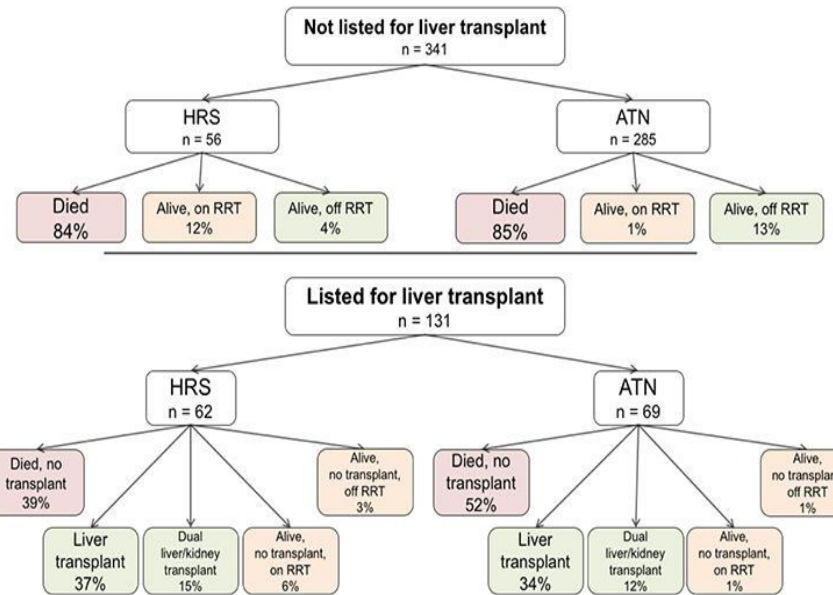
COHORT



Liver Tx Status

Listed		Not Listed	
55 [54,57]	Age	58 [57,59]	
36 [35,37]	MELD	34 [33,34]	

OUTCOME Six-month survival, renal recovery, transplant



CONCLUSION Mortality is similar between HRS and ATN and is extremely high without liver transplant.

Andrew Allegretti, Xavier Parada, Nwamaka Eneanya, Hannah Gilligan, Dihua Xu, Sophia Zhao, Jules Dienstag, Raymond Chung, and Ravi Thadhani.
Prognosis of Patients With Cirrhosis and Acute Kidney Injury Who Initiate Renal Replacement Therapy. CJASN doi:10.2215/CJN.03610417.

- ⦿ **RRT should not be denied to patients with cirrhosis listed for an LT and those who are in the evaluation process with the understanding that the decision of RRT initiation/continuation will be revisited if changes in transplant eligibility occur.**

- ⦿ **In patients with cirrhosis who are not considered to be LT candidates, the decision of RRT initiation has been considered **futile** in many cases, especially with the high mortality rate, low rate of renal recovery, high risk of complications such as bleeding, and more prolonged hospitalization, which consumes health care resources.**

- ⊙ **Old and recent literature confirm that RRT initiation in patients with cirrhosis and AKI carries a very poor prognosis and is associated with a high mortality rate that ranges between 60% and 80% within 28 days from RRT initiation.**

TAKE HOME MESSAGE

- ⦿ **HRS is a specialized functional type of prerenal AKI that occurs exclusively in patients with advanced cirrhosis and those with fulminant hepatic failure.**
- ⦿ **Liver Transplant is the treatment of choice.**
- ⦿ **There are no major differences in outcomes in patients with cirrhosis and AKI due to HRS compared after RRT has been initiated**

Thank you