



Transjugular Intrahepatic Portosystemic Shunt (TIPS) Placement Prevents Incident Hepatorenal Syndrome

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Background

- Hepatorenal syndrome (HRS) is a complication of cirrhosis with a poor prognosis.
- Transjugular intrahepatic portosystemic shunt (TIPS) is not currently a recommended treatment for HRS; however, studies show that TIPS improves renal function^{1,2} and is associated with decreased mortality in hospitalized patients with HRS³.
- Whether TIPS performed for other indications reduces the risk of incident HRS is unknown.

Methods

- We conducted a retrospective cohort study utilizing the TriNetX global health research network.
- We examined deidentified patient data using ICD-10 codes from patients aged 18-75 with cirrhosis. Patients with prior CKD, HRS, and prior TIPS were excluded.
- Outcomes in patients who underwent TIPS were compared to cirrhotic patients with ascites who did not undergo TIPS.
- Subjects were propensity score matched based on age and individual components of MELD score (serum Na, total bilirubin, INR, creatinine) documented 30 days prior to TIPS or ascites development.
- **Primary outcome: incident HRS**

Results

| | Control (n=629) | TIPS (n=621) |
|------------------------------|-----------------|---------------|
| Demographics | | |
| Age (years) | 54 +/- 11 | 55 +/- 11 |
| Female sex (%)* | 40 | 36 |
| White race (%)* | 72 | 82 |
| Laboratory evaluation | | |
| Serum Na (mmol/L) | 135 +/- 5.24 | 136 +/- 4.99 |
| Creatinine (mg/dL) | 0.96 +/- 0.69 | 0.91 +/- 0.42 |
| INR | 1.6 +/- 0.8 | 1.5 +/- 0.4 |
| Total bilirubin (mg/dL) | 4.7 +/- 7.0 | 2.3 +/- 3.6 |

Table 1: Cohort demographic and laboratory data. (* indicates values prior to propensity score matching)

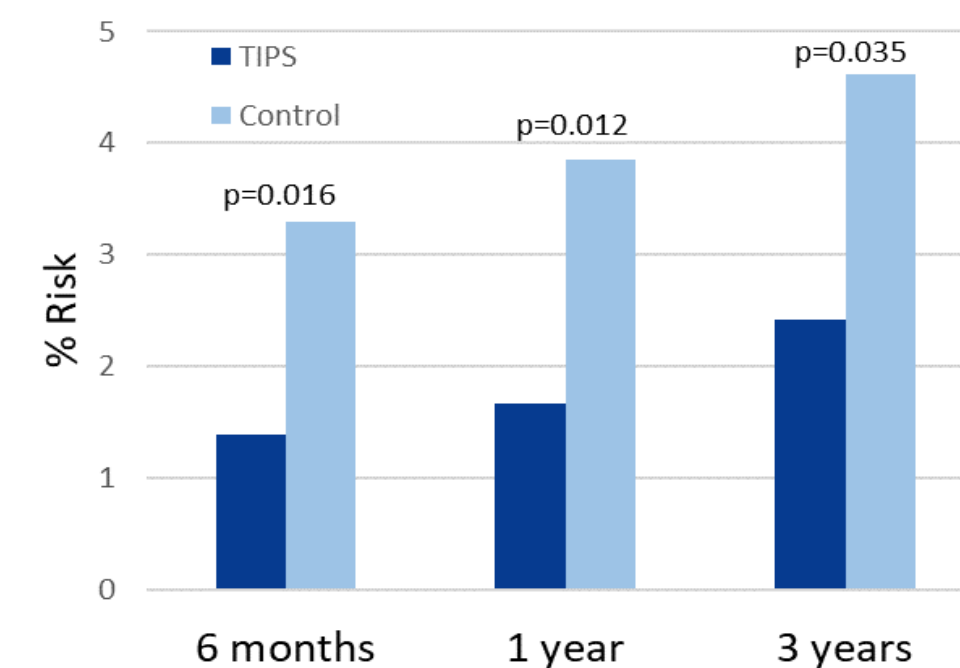


Figure 1: Patients undergoing TIPS had a significantly lower risk of developing HRS.

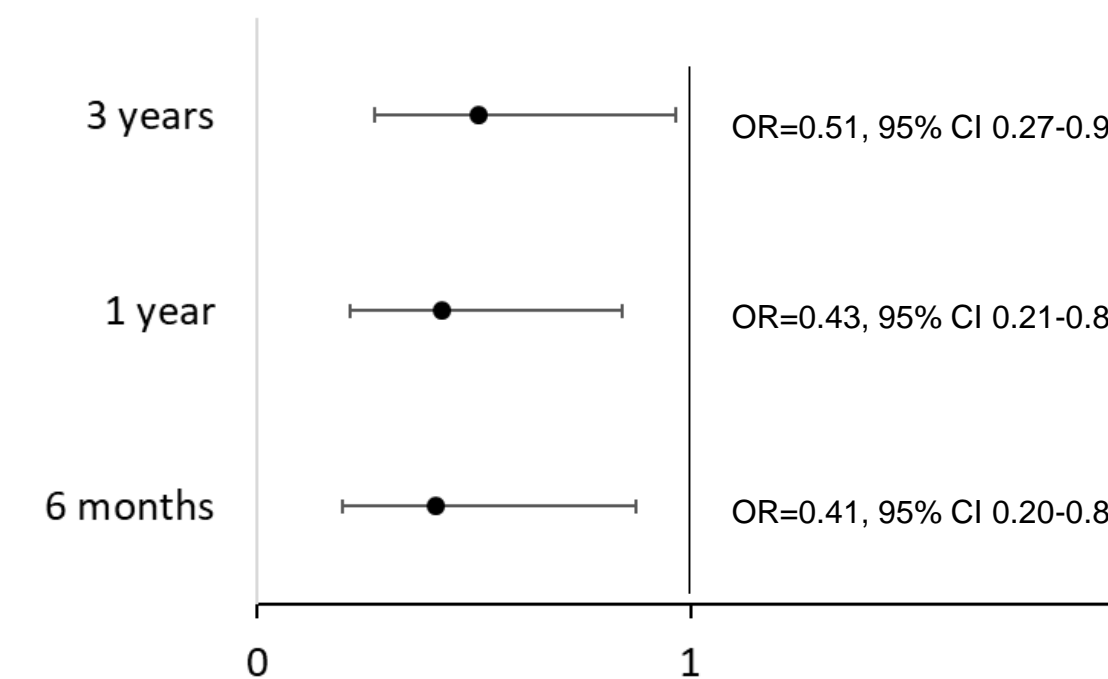


Figure 2: Patients undergoing TIPS were less likely to develop HRS at 6 months, 1, and 3 years compared to controls.

Conclusions

- Patients who underwent TIPS were less likely to later develop HRS.
- Our data suggests a protective effect of TIPS on the development of incident HRS.
- **Study strengths:**
 - Large multicenter cohort
 - 3-year follow up
 - Propensity score matching
- **Study limitations**
 - Retrospective design
 - Data acquisition via ICD-10 coding
- In addition to its beneficial effects on the treatment of other complications of portal hypertension, TIPS should be more readily considered and investigated as a means to prevent the development of HRS.
- Further research is warranted to elucidate the underlying pathophysiologic mechanism and better establish the protective effect of TIPS on HRS development.

References

1. Brensing KA, Textor J, Perz J, et al. Long term outcome after transjugular intrahepatic portosystemic stent-shunt in non-transplant cirrhotics with hepatorenal syndrome: a phase II study. *Gut*. Aug 2000
2. Wong F, Pantea L, Sniderman K. Midodrine, octreotide, albumin, and TIPS in selected patients with cirrhosis and type 1 hepatorenal syndrome. *Hepatology*. Jul 2004
3. Charilaou P, Devani K, Petrosyan R, Reddy C, Pysropoulos N. Inpatient Mortality Benefit with Transjugular Intrahepatic Portosystemic Shunt for Hospitalized Hepatorenal Syndrome Patients. *Dig Dis Sci*. Nov 2020