# Use and outcome of TIPS in hospitalized patients in Germany: A Nationwide study (2007–2018)

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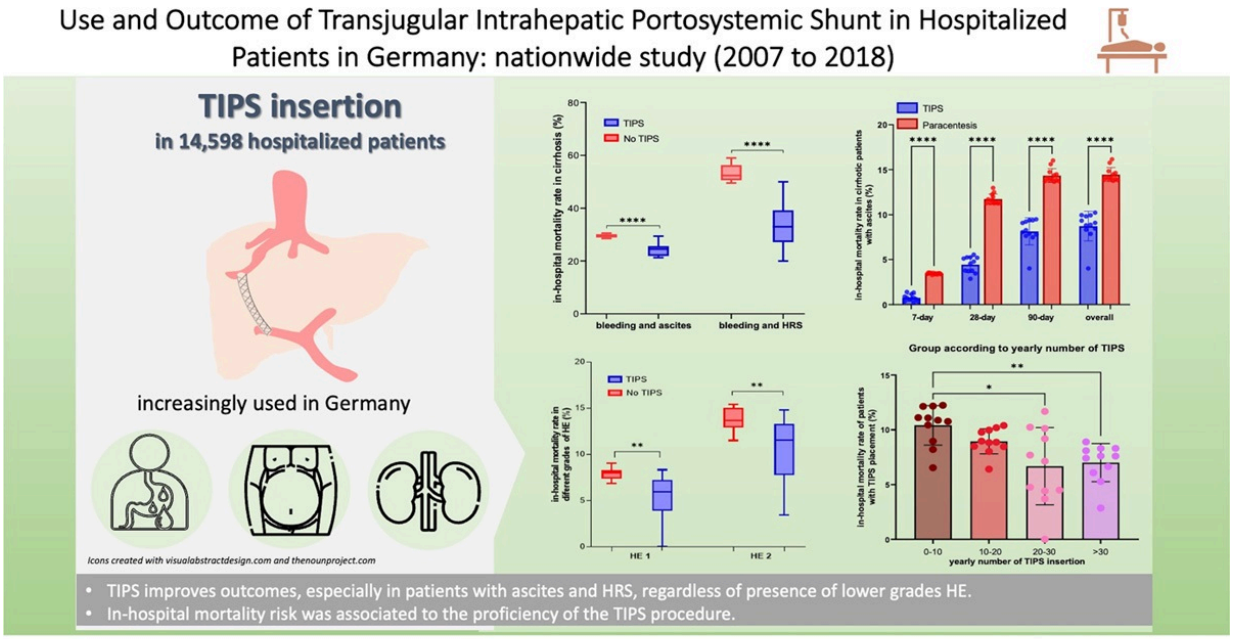
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## Abstract

Background:

The number of complications in patients admitted for cirrhosis has increased over time. Portal hypertension is the driver of many complications of cirrhosis. TIPS placement is the most effective treatment of portal

hypertension. The aim of this study was to analyze the use and impact of TIPS placement in the last decade in a nationwide study in Germany.

Methods:

We analyzed 14,598 admissions of patients for TIPS insertions in Germany from 2007 to 2018 using the DRG system, 12,877 out of 2,000,765 total admissions of patients with cirrhosis. All diagnoses and procedures were coded according to ICD-10-CM and OPS codes. The data were analyzed, focusing on the number of admissions and in-hospital mortality.

Results:

The number of TIPS placements increased over the last decade. In-hospital mortality of cirrhotic patients with TIPS decreased when it was placed for severe bleeding (15.2% [TIPS] vs. 19.5% [endoscopy treatment]), ascites (8.7% [TIPS] vs. 14.4% [paracentesis]), and hepatorenal syndrome (HRS) (17.1% [TIPS] vs. 43.3% [no-TIPS]). In the case of bleeding, TIPS significantly decreased in-hospital mortality and also in ascites and HRS. During hospitalization, 22.6% admissions of patients with TIPS insertion showed HE. However, in-hospital mortality in patients admitted with HE grades 1 or 2 and TIPS was lower than in patients without TIPS. In the logistic regression, a higher HE grade(3 and 4), infection, and circulatory disease were found to be independently associated with in-hospital mortality in patients with TIPS insertion.

Conclusion:

Our nationwide study demonstrates that TIPS insertion is increasingly used in Germany. TIPS improves outcomes, especially in patients with ascites and HRS, regardless of lower HE grades, while higher HE grades, infection, and circulatory diseases seem to be associated with risk of in-hospital mortality.