Title: Change in Platelet Count After Transjugular Intrahepatic Portosystemic Shunt Creation: An Advancing Liver Therapeutic Approaches (ALTA) Group Study

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interpretation with previous ALTA publications.

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TITLE: Platelet Recovery After Transjugular Intrahepatic Portosystemic Shunt Creation: An Advancing Liver Therapeutic Approaches Group Study

ABSTRACT

Purpose: To evaluate platelet recovery after transjugular intrahepatic portosystemic shunt (TIPS) creation and patient factors predicting platelet recovery following TIPS creation.

Materials and Methods: Adults with cirrhosis who underwent TIPS creation at 9 US hospitals from 2010-15 were included in this retrospective analysis. Change in platelets from pre- to 4 months post-TIPS was characterized. Logistic regression was used to assess factors associated with top quartile % platelet increase post-TIPS. Subgroup analyses were performed among patients with pre-TIPS platelets ≤50x10^9/L.

Results: 601 patients were included. Median absolute change in platelets was 1x10^9/L (-26x10^9/L – 25x10^9/L). Patients with top quartile % platelet increase had ≥32% platelet increase. In multivariable analysis, pre-TIPS platelets (OR, 0.97 per 10^9/L; 95% CI, 0.97-0.98), age (OR, 1.24 per 5y; 95% CI, 1.10-1.39), and pre-TIPS MELD (OR, 1.06 per point; 95% CI, 1.02-1.09) were associated with top quartile (≥32%) platelet increase.

94 patients (16%) had platelets ≤50x10^9/L pre-TIPS. Median absolute platelet change was 14x10^9/L (2x10^9/L-34x10^9/L). 54% of patients in this subgroup were in the top quartile for platelet increase. In multivariable logistic regression, age (OR, 1.50 per 5y; 95% CI, 1.11-2.02) was the only factor associated with top quartile platelet increase in this subgroup.

Conclusions: TIPS creation did not result in significant platelet increase, except among patients with platelet ≤50x10^9/L pre-TIPS. Lower pre-TIPS platelets, older age, and higher pre-TIPS MELD were associated with top quartile (≥32%) platelet increase in the entire cohort, whereas only older age was associated with this outcome in the patient subset with pre-TIPS platelets ≤50x10^9/L.

KEY WORDS

Blood Platelets; Fibrosis; Liver; Portosystemic Shunt, Transjugular Intrahepatic, ALTA Study Group

INTRODUCTION

Transjugular intrahepatic portosystemic shunt (TIPS) creation is an effective intervention for ascites and variceal bleeding, two common complications of portal hypertension in patients with cirrhosis.[1] Thrombocytopenia is another complication of portal hypertension in patients with cirrhosis that has important implications for periprocedural and peritransplant management of patients with cirrhosis, due to perceived risk of bleeding.[2-7] However, research regarding the impact of TIPS creation on thrombocytopenia is limited and the few prior studies investigating platelet recovery following TIPS creation have yielded conflicting results. Some studies have reported improvement in thrombocytopenia following TIPS creation.[8-13] In a study of 74 patients with cirrhosis who underwent TIPS creation, there was an average increase in platelet counts of 22%.[8] Another study of 55 patients with cirrhosis found a median platelet count increase of 19.7%.[9] In addition, there was a study in which 34 out of 45 (75%) patients with cirrhosis and thrombocytopenia (defined as platelet count <100 $x10^9$/L) showed an increase in platelet counts after TIPS creation, with a mean platelet count change from 83 ± 4 $x10^9$/L to 100.8 ± 5.4 $x10^9$/L.[10] Additionally, in a study of 11 patients with portal hypertension, all patients experienced a statistically significant improvement in platelet counts.[11] Another study of 21 patients with cirrhosis found an increase in mean platelet counts from 95 ± 44 $x10^9$/L to 123 ± 91 $x10^9$/L pre- to post-TIPS, although the difference was only significant when a portosystemic pressure gradient <12 mmHg was achieved.[12] Further, a study of 23 patients found a significant increase in platelet counts from 85.9 ± 8.4 $x10^9$/L to 135.3 ± 16.8 $x10^9$/L pre- to post-TIPS.[13] While these studies found a significant increase in platelet counts following TIPS creation, others reported no significant change in platelets after TIPS creation,[14,15] or a trend towards decreased platelet counts after TIPS creation.[16] No significant changes in platelet counts post-TIPS were found in two studies, one of 62 patients with cirrhosis,[14] and one of 60 patients with cirrhosis.[15] Finally, one study found that platelet count tended to decrease post-TIPS from 120.1 ± 72.1 $x10^9$/L to 99.8 ± 51.4 $x10^9$/L, although the findings were not statistically significant. In addition to the these

conflicting results, existing studies are conflicting regarding factors, such as patient or procedural variables, that may predict platelet recovery. One study reported that portosystemic pressure gradient was predictive of platelet recovery,[12] while another reported no such association.[9] Studies are also conflicting on whether pre-TIPS thrombocytopenia severity predicts platelet recovery post-TIPS creation.[8,12] Most of the prior studies have been limited by small sample sizes and to single medical centers. The present study is a retrospective analysis of platelet recovery in a multicenter cohort of patients with cirrhosis undergoing TIPS creation.[17,18] This study is intended to evaluate platelet count change after TIPS creation and to identify factors predicting platelet count increase following TIPS creation. Thrombocytopenia in portal hypertension is thought to be caused by hypersplenism or splenic sequestration due to congestion in the portal vein.[19] The hypothesis of this study is that relief of congestion in the portal vein by TIPS will lead to an improvement in thrombocytopenia.

MATERIALS AND METHODS

Participants

The Advancing Liver Therapeutics Approaches (ALTA) Study and the ALTA Study Group has been previously described.[17,18] In short, adult patients with cirrhosis who underwent TIPS at nine academic medical centers in the United States from January 1, 2010 through December 31, 2015 were included in this study. This study was approved by the institutional review boards at each of the 9 participating sites.

Clinical Data

Demographic and clinical data were obtained by direct medical chart review, common procedural terminology (CPT) codes, ICD-9/10 billing codes, encounter codes, and problem list codes by research personnel at participating study sites and uploaded to a central study database using Research Electronic Data Capture (REDCap) software hosted at the organizing

center. Etiologies of cirrhosis were categorized as alcohol-associated liver disease (ALD), hepatitis C, non-alcoholic fatty liver disease (NAFLD), or other etiologies. Indications for TIPS were categorized as refractory ascites and/or hepatic hydrothorax, variceal bleeding, portal vein thrombosis/other indications, or multiple indications. Portosystemic pressure gradients were calculated from the difference between portal venous and systemic venous pressures prior to and following TIPS creation. The pre-TIPS main portal vein direction of flow was determined from the pre-TIPS liver ultrasound. Pre-TIPS baseline data were obtained within 2 to 28 days before TIPS. Post-TIPS data defined as 4 months post-TIPS were obtained between 90-150 days post-TIPS. Platelet count was evaluated at 4 months post-TIPS creation to allow sufficient time for platelet counts to recover. Based on the clinical experience of the investigators and prior studies, it can take 3-4 months for refractory ascites to resolve after a TIPS.[20-22] A time frame at least beyond 3 months post-TIPS was chosen to allow for post-TIPS recovery and "recalibration." Although 6 months would have been ideal, follow-up in this retrospective study was variable at 6 months. Therefore, the 4 month time frame was the best time frame to balance these two concerns. Additionally, percent change in platelet counts was chosen rather than absolute change because it takes into account the baseline of the patient, as a $10x10^9$/L increase is more significant in a patient with a baseline of $30x10^9$/L than it is to a patient who starts with a baseline of $80x10^9$/L. Change in platelets between post- and pre-TIPS was calculated, then the percentage change was divided into quartiles. The top quartile for platelet count increase was isolated and assessed for patient factors associated with inclusion into this group: 1. Age as thrombocytopenia is associated with age,[23] 2. Pre-TIPS Model for End-Stage Liver Disease (MELD)as an indicator of liver disease severity and the most commonly used metric to assess risk for hepatic decompensation after TIPS among the investigators, 3. Pre-TIPS platelet count as it is hypothesized that severity of thrombocytopenia was associated with platelet response post-TIPS. These variables were selected for multivariable analysis *a priori* via

purposeful selection, as the authors believed that these variables could potentially confound the relationship between the primary predictor and the primary outcome.

Procedural Technique

TIPS creation procedures, including target end points, associated variceal/portosystemic shunt embolization, and any additional ancillary interventions, were performed at centers participating in this retrospective study according to individual institutional and operator standards following established techniques. The only procedural variables included in this analysis were pre-TIPS portosystemic gradient and post-TIPS portosystemic gradient (although specific anatomy of portosystemic shunts was not captured).

Statistical Analysis

Categorical variables were presented as percentages while continuous variables were presented as medians and interquartile ranges (IQR). Variables were compared by change in platelet count using Wilcoxon rank-sum and chi-square tests, respectively. Patients were categorized as being in the top quartile for platelet increase or not in the top quartile for platelet increase by percent change in platelet count pre- to 4 months post-TIPS. Change in platelet count after TIPS creation was assessed using paired t-tests for pre- to 4 months post-TIPS. Then, the pre-to-post TIPS outcome of interest used in univariable and multivariable logistic regression was being in the top quartile for platelet increase as defined above. The association between being in the top quartile for platelet increase and patient factors pre-TIPS platelet count, age, and pre-TIPS MELD, was assessed using multivariable logistic regression at 4 months post-TIPS. Given the clinical relevance of severe thrombocytopenia (platelets ≤50 x 10^9/L) for perceived risk of bleeding with procedures, subgroup analyses among those with pre-TIPS platelets ≤50 x 10^9/L were performed.

Inclusion of patients in this study is illustrated in Figure 1. Between January 1, 2010 through December 31, 2015, 1260 patients with cirrhosis underwent TIPS creation at the 9 US hospitals participating in this study. Of these 1260 patients, 184 (15%) died within 4 months and 115 (9%) were transplanted within 4 months. Patients who died or were transplanted within 4 months post-TIPS were censored from the present study. An additional 360 (29%) were excluded from this study due to either missing pre-TIPS platelet counts or missing 4 months post-TIPS platelet counts. Therefore, 601 patients with cirrhosis were included in the analysis for the present study.

Baseline characteristics of the 601 patients included in this analysis are presented in Table 1. Two-hundred twenty-seven (38%) were female, median age was 57 (IQR 52-62) years, and median pre-TIPS MELD was 13 (IQR 11-17). Most common indications for TIPS creation were: 331 (55%) ascites, 180 (30%) variceal bleeding (encompassing TIPS creation for acute bleeding and primary and secondary prophylaxis), 56 (9%) portal vein thrombosis/other, and 34 (6%) multiple indications.

RESULTS

For the entire cohort, there was no significant median absolute change in platelet count from pre- to post-TIPS: $1x10^9$/L (IQR -26 $x10^9$/L – 25 $x10^9$/L). The distribution of percent change in platelet count is shown in Figure 2, and the relationship between pre- and post-TIPS platelet counts are shown in Figure 3. In the subgroup of those with severe thrombocytopenia, there was a significant absolute change in pre-to-post TIPS: $14x10^9$/L (IQR 2 $x10^9$/L – 34 $x10^9$/L). The top quartile for platelet change by percentage was calculated to be ≥32% platelet count increase.

In the 601 patients, patients were categorized as being in the top quartile for platelet increase (≥32% platelet count increase) or not in the top quartile for platelet increase at 4 months-post TIPS (Table 1). The two groups were similar by platelet response categories in sex, race, pre-TIPS portosystemic gradient, pre-TIPS main portal vein direction of flow, pre-TIPS portal vein diameter, presence of hepatic encephalopathy, and presence of a variceal bleed within one year prior to TIPS ($p>0.05$).

Compared to those who did not experience a pre- to post-TIPS change in platelet count of ≥32%, those who did experience a ≥32% increase in platelet count were more likely to be older (58 vs. 57 years, $p = 0.001$), have an "other" etiology of cirrhosis (24% vs 16%, $p = 0.02$), have an indication for TIPS of variceal bleeding (39% vs. 27%, $p = 0.002$) or PVT/other (13% vs 8%, $p = 0.002$), have a lower pre-TIPS platelet count (63 vs 103, $p< 0.001$), have a higher pre-TIPS MELD (15 vs 13, $p<0.001$), have variceal embolization performed at TIPS (32% vs 24%, $p = 0.04$), and have HCC (12% vs 6%, $p=0.01$).

For the entire cohort, the results of univariable and multivariable logistic regression analysis of factors predictive of being in the top quartile for platelet increase 4 months following TIPS creation are presented in Table 2. In univariable logistic regression, older age, lower pre-TIPS platelet count, and higher pre-TIPS MELD were significantly associated with being in the top quartile for platelet increase. In multivariable analysis, these patient factors remained significantly associated with being in the top quartile for platelet increase: age (OR, 1.24 per 5 years; 95% CI, 1.10-1.39), pre-TIPS platelet count (OR, 0.97 per 10^9/L; 95% CI, 0.97-0.98), and pre-TIPS MELD (OR, 1.06 per point; 95% CI, 1.02-1.09).

For the subset of patients with severe pre-TIPS thrombocytopenia (n = 94, 16% of entire cohort), the results of univariable and multivariable logistic regression analysis of factors

predictive of being in the top quartile for platelet increase 4 months following TIPS creation are presented in Table 3. In univariable logistic regression, age is significantly associated with being in the top quartile for platelet increase ($p<0.05$), while pre-TIPS platelet count and pre-TIPS MELD were not ($p>0.05$). This remained true for multivariable logistic regression as well: age (OR, 1.50 per 5 years; 95% CI, 1.11-2.02), pre-TIPS platelet count (OR, 0.97 per 10^9/L; 95% CI, 0.92-1.01), and pre-TIPS MELD (OR, 1.00 per point; 95% CI, 0.93-1.09). Additionally, median platelet count changed significantly from 40 to 53 ($p<0.0001$) in this subset, with 54% being in the top quartile for platelet increase. Moreover, 50 (53%) patients in this severe thrombocytopenia cohort experienced an increase in platelet count that brought them over the threshold for severe thrombocytopenia (50 x10^9/L).

DISCUSSION

In this large, multicenter study of 601 patients with cirrhosis who underwent TIPS creation, there was not a statistically significant change in platelet count 4 months after TIPS creation. However, in the subset of patients with a pre-TIPS platelet count < 50 x 10^9/L, there was a significant increase in platelets 4 months post-TIPS, with 54% achieving a ≥32% increase in their platelet count and 53% crossing the threshold to no longer have severe thrombocytopenia.

Prior studies investigating the effect of TIPS on thrombocytopenia have reported conflicting results. Some were consistent with the present study, showing no significant change in platelet count,[14,15] while others showed either a significant platelet increase or decrease.[8-13,16] Although prior studies have conflicted in whether cohorts as a whole experienced a significant change in platelet count, all studies have reported that subsets of patients with cirrhosis, such as those with severe pre-TIPS thrombocytopenia or those with lower post-TIPS portosystemic gradient, do experience a significant increase in platelets post-TIPS creation.[8]

In the present study, lower pre-TIPS platelet count predicted a greater increase in platelet count post-TIPS. This finding is consistent with two prior studies investigating the effect of TIPS on thrombocytopenia that showed variation in platelet response.[8,9] Prior studies investigating change in platelets after TIPS creation have been limited in sample size. The main strength of this study in comparison with prior literature is the large cohort size, allowing analysis of factors predictive of platelet recovery following TIPS creation and subgroup analysis of a sizeable cohort with severe thrombocytopenia (platelet count ≤ 50 x 10^9/L) prior to TIPS creation.

In the analysis of the entire cohort, older age, lower pre-TIPS platelet count, and higher pre-TIPS MELD score were associated with a significant increase in platelet count post-TIPS independent of each other in multivariable analysis. In the subgroup analysis of patients with a pre-TIPS platelet count ≤ 50 x 10^9/L, older age was the only factor associated with a significant increase in platelet count post-TIPS.

The reason for the association found between both lower pre-TIPS platelet count and higher MELD score and greater post-TIPS platelet recovery in the overall cohort is unclear. While one hypothesis could be that higher MELD scores and lower pre-TIPS platelet count are indicative of increased severity of portal hypertension, no associations between pre-TIPS portosystemic pressure gradient or change in the portosystemic gradient and platelet recovery were found in multivariable analysis. Additionally, information on extra-hepatic native portosystemic shunts was not captured in this study, so the true severity of portal hypertension in this cohort could not be assessed. It is also possible that there is a reversible component to liver disease or acute-on-chronic liver failure in the higher MELD patients. Further investigation of this hypothesis is necessary with a cohort that includes a greater number of higher MELD patients.

The present study has a number of limitations. First, this study was a retrospective analysis and was limited by the availability of clinical data. In addition, some of the data was extracted using ICD-9 codes, which could have led to a degree of inaccuracy compared to manual chart review. Analyses of the available data also could have been subject to selection bias, as complete data sets were not available for all participants. In addition, the small numbers of patients in each of the “other” categories for etiology of cirrhosis preclude the ability to evaluate specific etiologies within this category. Finally, the dataset did not include the collection of certain variables, such as white blood cell count, detailed information about the stent type, type of variceal bleed, timing of platelet count collection with respect to acute bleeding events, information on splenic embolization, or use of medications that may induce thrombocytopenia, that may be considered in future work to explore the mechanism or more technical aspects related to the association that was identified in this study. Future work should also include assessment of craniocaudal diameter to explore the underlying mechanism of the association between spleen size and thrombocytopenia, as splenic sequestration is a proposed mechanism for thrombocytopenia in patients with cirrhosis.

Despite these limitations, this study is the largest to analyze platelet recovery after TIPS creation. Overall, patients with cirrhosis do not on average experience a significant change in platelet count after TIPS creation. However, substantial improvement in platelet counts was seen in some subgroups of patients, namely, those with lower pre-TIPS platelet counts, who were older, and who had higher MELD scores. Of particular clinical relevance, over half of the patients with severe pre-TIPS thrombocytopenia experienced in a rise in the platelet count to greater than 50 x 10^9/L, the threshold that is considered to be associated with a clinically meaningful risk of bleeding. This study offers the community additional information about the indirect benefits of TIPS creation and lays the foundation for future work investigating mechanisms for platelet recovery post-TIPS.

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Table 1. Characteristics of the 601 patients with cirrhosis included in this study.

Characteristics		All n=601	By Platelet Response after TIPS		p-value
			Not Top Quartile for % Platelet Increase n=450 (75%)	Top Quartile for % Platelet Increase n=151 (25%)	
Age, years		57 (52-62)	57 (50-62)	59 (54-64)	0.001
Female		227 (38%)	169 (38%)	58 (38%)	0.85
Race/ Ethnicity	**Non-Hispanic White**	410 (68%)	308 (68%)	102 (68%)	0.74
	Black	26 (4%)	22 (5%)	4 (3%)	
	Hispanic	118 (20%)	85 (19%)	33 (22%)	
	Asian	10 (2%)	7 (2%)	3 (2%)	
	Other	37 (6%)	28 (6%)	9 (6%)	
Etiology of liver disease	**Alcohol**	184 (31%)	152 (34%)	32 (21%)	0.02
	Hepatitis C	194 (32%)	140 (31%)	54 (36%)	
	Non-alcoholic fatty liver disease	114 (19%)	85 (19%)	29 (19%)	
	Other	109 (18%)	73 (16%)	36 (24%)	
Indication for TIPS	**Ascites/hepatic hydrothorax**	331 (55%)	262 (58%)	69 (46%)	0.002
	Variceal bleeding	180 (30%)	121 (27%)	59 (39%)	
	PVT/Other	56 (9%)	37 (8%)	19 (13%)	
	Multiple	34 (6%)	30 (7%)	4 (3%)	
Pre-TIPS platelet count (x 10^9/L)		89 (63-132)	103 (74-145)	63 (46-81)	0.0001
MELD		13 (11-17)	13 (10-16)	15 (11-19)	0.0002
INR		1.4 (1.2-1.6)	1.4 (1.2-1.6)	1.5 (1.3-1.6)	0.002
Total bilirubin, mg/dL		1.5 (1.0-2.4)	1.4 (1.0-2.2)	1.8 (1.2-3.2)	0.0001
Creatinine, mg/dL		1.0 (0.8-1.3)	1.0 (0.8-1.3)	1.1 (0.8-1.4)	0.11
Albumin, g/dL		2.9 (2.5-3.3)	2.8 (2.5-3.2)	2.9 (2.4-3.4)	0.42
Dialysis		16 (3%)	9 (2%)	7 (5%)	0.08
Ascites		441 (74%)	349 (79%)	92 (62%)	<0.001
Hepatic encephalopathy		269 (45%)	197 (44%)	72 (48%)	0.40
Hepatocellular carcinoma		44 (8%)	26 (6%)	18 (12%)	0.01
Variceal bleeding within 1 year prior to TIPS		214 (36%)	153 (34%)	61 (41%)	0.15
Gastric varices		105 (17%)	83 (18%)	22 (15%)	0.28
Pre-TIPS Portosystemic Gradient		16 (13-20)	16 (13-21)	16 (13-19)	0.15
Post-TIPS Portosystemic Gradient		6 (4-8)	6 (4-8)	6 (4-8)	0.19
Change in Portosystemic Gradient		10 (7-14)	11 (8-14)	10 (7-14)	0.31
Pre-TIPS main portal vein flow direction	**Hepatopetal**	285 (92%)	220 (93%)	65 (88%)	0.31
	Hepatofugal	15 (5%)	10 (4%)	5 (7%)	
	No flow	10 (3%)	6 (3%)	4 (5%)	
Pre-TIPS portal vein diameter		1.7 (1.4-12)	1.7 (1.4-13)	1.7 (1.4-10)	0.57
Variceal embolization at TIPS		149 (26%)	102 (24%)	47 (32%)	0.04

* Median (interquartile range) or %; patient in the top quartile for % platelet increase had ≥32% platelet increase

TIPS, Transjugular intrahepatic portosystemic shunt

PVT, portal vein thrombosis

MELD, Model for End-Stage Liver Disease

INR, international normalized ratio

Table 2. Univariable and multivariable models to assess factors associated with a top quartile increase in platelets 4 months after TIPS in the entire cohort.

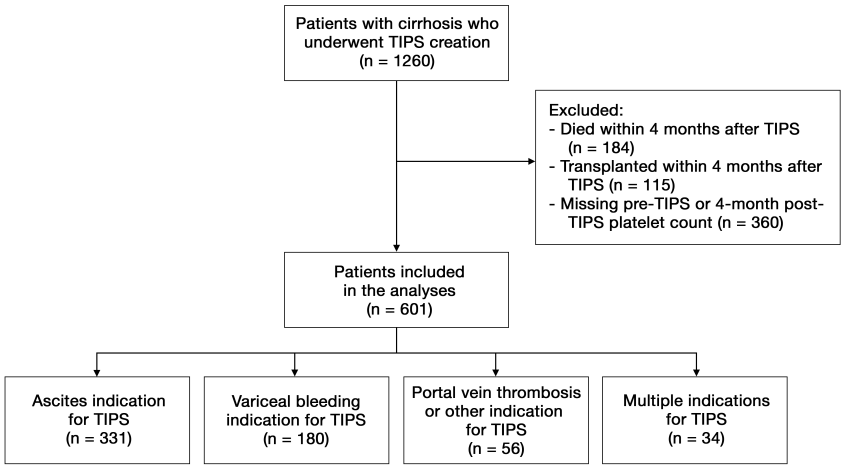
	Odds Ratios for a Top Quartile Increase in Platelets (95% CI) p-value	
	Univariable Model	**Multivariable Model**
Pre-TIPS Platelets (x 10^9/L)	0.98 (0.97-0.98) p<0.001	0.97 (0.97-0.98) p<0.001
Age, per 5 years	1.18 (1.06-1.31) p=0.003	1.24 (1.10-1.39) p<0.001
Pre-TIPS MELD	1.06 (1.03-1.09) p<0.001	1.06 (1.02-1.09) p=0.003

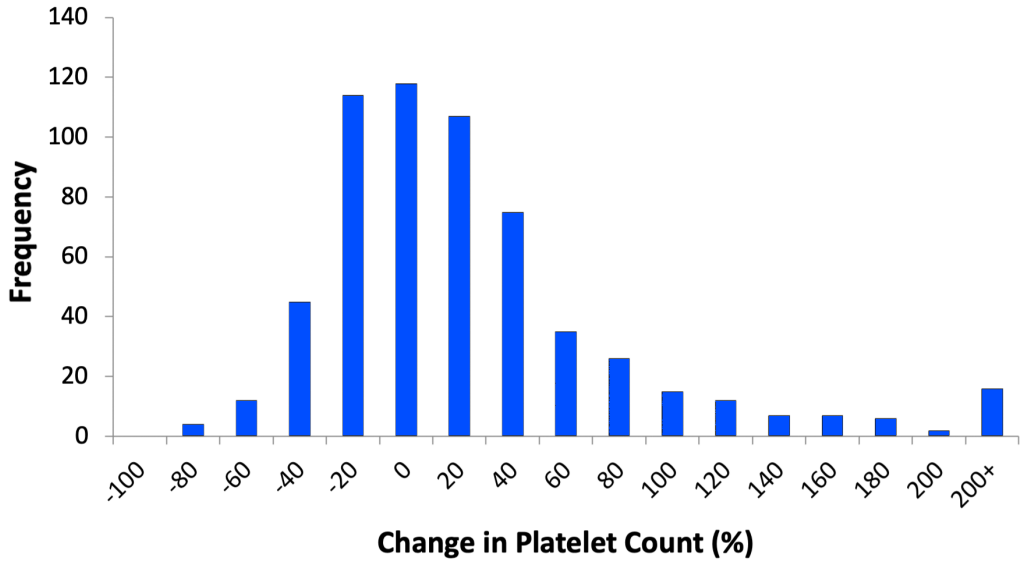
TIPS, Transjugular intrahepatic portosystemic shunt
MELD, Model for End-Stage Liver Disease

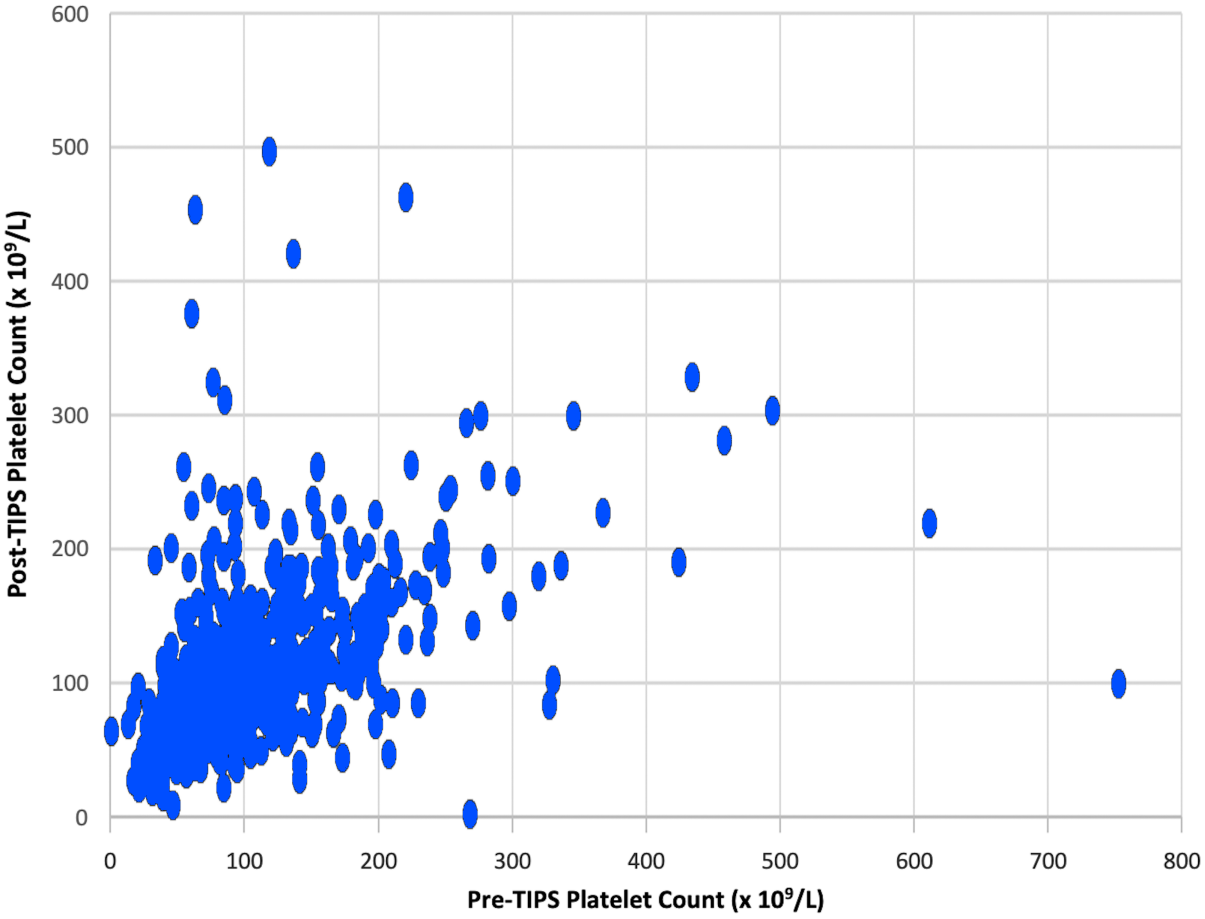
Table 3. Univariable and multivariable models to assess factors associated with a top quartile increase in platelets 4 months after TIPS in those with severe pre-TIPS thrombocytopenia.

	Odds Ratios for a Top Quartile Increase in Platelets (95% CI) p-value	
	Univariable Model	**Multivariable Model**
Pre-TIPS Platelets (x 10^9/L)	0.96 (0.92-1.01) p=0.11	0.97 (0.92-1.01) p=0.13
Age, per 5 years	1.49 (1.12-1.99) p=0.006	1.50 (1.11-2.02) p=0.008
Pre-TIPS MELD	1.00 (0.92-1.08) p=0.97	1.00 (0.93-1.09) p=0.93

TIPS, Transjugular intrahepatic portosystemic shunt
MELD, Model for End-Stage Liver Disease


Patients with cirrhosis who underwent TIPS creation (n = 1260)
Excluded:
- Died within 4 months after TIPS (n = 184)
- Transplanted within 4 months after TIPS (n = 115)
- Missing pre-TIPS or 4-month post-TIPS platelet count (n = 360)
Patients included in the analyses (n = 601)
Ascites indication for TIPS (n = 331)
Variceal bleeding indication for TIPS (n = 180)
Portal vein thrombosis or other indication for TIPS (n = 56)
Multiple indications for TIPS (n = 34)


140
120
100
80
60
40
20
0
Frequency
-100
-80
-60
-40
-20
0
20
40
60
80
100
120
140
160
180
200
200+
Change in Platelet Count (%)


600
500
400
300
200
100
0
Post-TIPS Platelet Count (x 10⁹/L)
0
100
200
300
400
500
600
700
800
Pre-TIPS Platelet Count (x 10⁹/L)

RESEARCH HIGHLIGHTS

- This study found that patients with cirrhosis as a whole do not experience significant increases in platelet counts after TIPS creation.
- The subset of patients with pre-TIPS plaletet count < 50 x 10^9/L do experience significant increases.
- This study found that patients who have lower pre-TIPS platelet counts, are older, and have higher pre-TIPS MELD scores are most likely to experience the greatest platelet count increase following TIPS creation.