INCIDENCE AND RISK FACTORS OF VENOUS THROMBOEMBOLISM IN POST-ALLOGENEIC HEMATOPOIETIC STEM CELL TRANSPLANT PATIENTS RECEIVING INTRAVENOUS IMMUNOGLOBULIN: A SINGLE-CENTER RETROSPECTIVE STUDY

Alexander Rudich[1], Robert Sierra[1], Sydney Fobare[2], Qiuhong Zhao[3], Justin Tossey[3], Marina Beltrami-Moreira[3], Marcos DeLima[3], Gabriela Sanchez-Petitto[4]

1. The Ohio State University College of Medicine, Columbus, OH, USA
2. Department of Medicine, Washington University School of Medicine, St. Louis, MO, USA
3. Department of Internal Medicine, Division of Hematology, The Ohio State University College of Medicine, Columbus, OH, USA
4. Department of Medicine, Section of Hematology and Oncology, Baylor College of Medicine, Houston, TX, USA

The James
The Ohio State University
Wexner Medical Center

INTRODUCTION

Venous thromboembolism (VTE) is a recognized complication of intravenous immunoglobulin (IVIG).

The half life of IVIG is between 21-28 days and thrombotic risk is likely mediated by transient hyperviscosity and peri-infusion physiologic changes[1].

Allogenic hematopoietic stem cell transplant (alloHSCT) recipients already have a high baseline VTE risk (~5%) due to GVHD, catheters, inflammation, and prolonged hospitalization[2].

IVIG represents an additional, modifiable risk factor for VTE in this population, yet limited data exist quantifying VTE incidence and risk factors in alloHSCT patients receiving IVIG.

AIM

To determine the incidence and associated risk factors of VTE in patients who have undergone alloHSCT and received IVIG therapy compared to those who did not.

This data may inform risk stratification and thromboprophylaxis recommendations in this high-risk group.

METHOD

Single-institution, retrospective cohort study

430 patients underwent alloHSCT between February 2018 and February 2024 at the Ohio State University.

VTE was defined as either DVT or PE, with catheter-associated events included.

Patients with prior VTE or long-term anticoagulation were excluded.

Cumulative incidence of thrombosis was estimated treating death without VTE as a competing event.

Competing risk regression model was used to evaluate the association between IVIG use and risk of VTE

IVIG was analyzed as a time-dependent covariate in the regression model

CONCLUSIONS

IVIG may be associated with an increased short-term thrombosis risk following alloHSCT

Our study is limited by the retrospective, single-center design and potential confounding from post-transplant factors such as acute GVHD

Further studies should validate these findings in larger, multicenter cohorts and ultimately prospective studies may be beneficial

RESULTS

Table 1. Baseline Characteristics

Characteristic	IVIG (N=165)	No IVIG (N=265)	P-value
Age, median (range)	57 (20-79)	58 (19-76)	0.60
Male Sex	57.6%	52.8%	0.34
Intermediate risk disease	2.5%	16.6%	0.01*
Match unrelated donor	70.9%	61.9%	0.02*
ABO mismatch	23.6%	0.8%	0.00
RIC/NMA conditioning	63.0%	58.1%	0.31

*For risk and donor type, the p-value represents the overall categorical comparison.

Table 2. Characteristics of VTE Patients

Characteristic	IVIG VTE (N=18)	No IVIG VTE (N=41)	P-value
Age, median years	63.5	59	0.04
Symptomatic VTE	88.9%	90.2%	0.99
Catheter related	50.0%	63.4%	0.40
Pulmonary embolism	6	8	
Lower extremity DVT	8	17	
Upper extremity DVT	7	19	
Acute GVHD	94.4%	58.5%	0.01

Table 3. Time-dependent Analysis

Time dependent IVIG exposure	HR	95% CI	P-value
28-day window	2.12	1.04 – 4.34	0.04
56-day window	2.05	1.07 – 3.94	0.03

- Among 430 allo-HSCT recipients, 165 received IVIG and 265 did not.
- VTE occurred in 59 patients (13.7%), including 18 IVIG recipients (10.9%) and 41 patients who did not receive IVIG (15.5%) (p= 0.17)
- Among patients who developed VTE, acute GVHD was more common in IVIG recipients than non-IVIG patients (94.4% vs 58.5%, p=0.01).
- **When IVIG exposure was modeled as a time-dependent covariate, IVIG was associated with increased VTE hazard during the 28-day post-exposure window (HR 2.12, 95% CI 1.04–4.34; p=0.04).**

CONTACT INFORMATION

Alexander.Rudich@osumc.edu, Gabriela.Sanchez-Petitto@bcm.edu

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