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Trends Analysis of Inpatient Outcomes of Venous Thromboembolism in Patients with Underlying Nonalcoholic Fatty Liver Disease: A Nationwide Inpatient Sample Analysis

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INTRODUCTION

- Nonalcoholic fatty liver disease (NAFLD) is the leading cause of chronic liver disease worldwide and is often comorbid with metabolic syndrome.
- There have been multiple studies suggesting the increased risk of deep vein thrombosis (DVT), pulmonary embolism (PE) and portal vein thrombosis (PVT) in patients with NAFLD.
- Possible mechanisms include the presence of longstanding chronic inflammation leading to the activation of the coagulation system.

AIM

- We aim to determine the trends in patients hospitalized with VTE and concomitant NAFLD, and the various factors associated with inpatient outcomes.

METHODS

- The NIS database was used to identify hospitalized adult patients with VTE and secondary diagnoses of NAFLD from 2010-2014 using ICD codes.
- Primary outcomes included the trend of the prevalence of the comorbid diseases of NAFLD and VTE (including DVT, PE, and PVT) and related inpatient outcomes.
- Secondary outcomes included factors that were independently associated with hospitalized mortality.

RESULTS

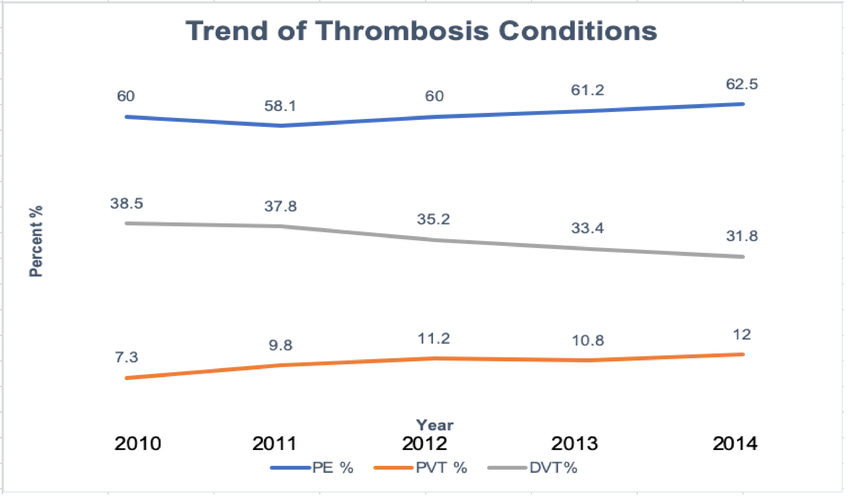
Table 1. Association of patient and hospital characteristics on mortality outcomes of individuals hospitalized for venous thromboembolism and comorbid nonalcoholic fatty liver disease.

	Unadjusted Model		Adjusted Model	
	Odds ratio (95% CI)	p-value	Odds ratio (95% CI)	p-value
Age				
18-39	1	REF	1	REF
40-49	1.25 (0.76,2.06)	0.38	1.16 (0.69,1.92)	0.57
50-59	1.98 (1.26,3.1)	**0.0028**	1.61 (1.02,2.55)	**0.041**
60-69	2.58 (1.66,3.99)	**<.0001**	1.94 (1.24,3.05)	**0.0039**
70+	3.28 (2.12,5.07)	**<.0001**	2.31 (1.47,3.62)	**0.00026**
Sex				
Male	1.06 (0.87,1.31)	0.54	1.24 (1,1.53)	**0.048**
Female	1	REF	1	REF
Race				
White	1	REF	1	REF
Black	0.39 (0.23,0.65)	**0.00035**	0.4 (0.24,0.68)	**0.00073**
Hispanic	1.19 (0.85,1.66)	0.31	1.23 (0.86,1.75)	0.24
Other	1.74 (1.15,2.64)	**0.0093**	2.02 (1.31,3.12)	**0.0014**
Hospital region				
Northeast	1	REF	1	REF
Midwest	1.57 (1.02,2.42)	**0.039**	1.46 (0.94,2.27)	0.095
South	2.46 (1.67,3.62)	**<.0001**	2.27 (1.53,3.36)	**<.0001**
West	1.94 (1.27,2.98)	**0.0022**	1.85 (1.19,2.86)	**0.0059**
Median household income for patient's ZIP Code, %				
Q1	3.66 (2.36,5.67)	**<.0001**	3.59 (2.29,5.61)	**<.0001**
Q2	4.22 (2.74,6.5)	**<.0001**	4.26 (2.75,6.61)	**<.0001**
Q3	4.03 (2.6,6.24)	**<.0001**	4.57 (2.94,7.13)	**<.0001**
Q4	1	REF	1	REF
Hepatocellular carcinoma	5.82 (3.38,10.01)	**<.0001**	3.33 (1.83,6.05)	**<.0001**
Malignancy	3.84 (3.02,4.87)	**<.0001**	3.47 (2.68,4.5)	**<.0001**
Heart failure	3.49 (2.74,4.44)	**<.0001**	2.74 (2.12,3.55)	**<.0001**
Pulmonary circulation disorders	3.35 (2.73,4.12)	**<.0001**	3.11 (2.51,3.86)	**<.0001**

REF = reference; Median household income for patient's ZIP Code (based on current year): Q1 = 0- 25th percentile; Q2 = 26th to 50th percentile; Q3 = 51st to 75th percentile; Q4 = 76th to 100th percentile

PE = pulmonary embolism; DVT = deep vein thrombosis (low extremities); PVT = portal vein thrombosis

Figure 1. Trend in the percent of thrombosis conditions in patients hospitalized for venous thromboembolism and comorbid nonalcoholic fatty liver disease.



DISCUSSION & CONCLUSIONS

- Between 2010 and 2014, there was an uptrend in the overall prevalence of VTE in patients hospitalized with NAFLD, while LOS decreased, and mortality remained unchanged.
- Further analysis identified ethnic and socioeconomic disparities significantly affecting mortality.
- Continued prospective studies are needed in order to evaluate the pathophysiology and social impacts of at-risk individuals and their effects on clinical outcomes.