

## 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. There have been studies suggesting the increased risk of deep vein thrombosis (DVT), pulmonary embolism (PE) and portal vein thrombosis (PVT) in patients with NAFLD. This study aims to determine the trends in patients hospitalized with VTE and concomitant NAFLD, and the factors associated with outcomes.

### Methods:

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

### Results:

Between 2010 and 2014, there was an uptrend of VTE with NAFLD hospitalizations (8.8 to 13.2 per 100,000 adults,  $p < 0.0001$ ). These findings were also associated with an increase of PE (60% to 62.5%,  $p = 0.0005$ ) and PVT (7.3% to 12%,  $p < 0.001$ ). There was a decrease in DVT (38.5% to 31.8%,  $p < 0.0001$ ) over the time span. Length of stay (LOS) decreased from 6.7 days to 5.9 days ( $p = 0.03$ ). After adjusting for covariates, the mortality was significantly higher in those  $> 50$  years old, especially  $> 70$  years old [adjusted odds ratio (aOR) 2.31,  $p = 0.0003$ ] and males (aOR 1.24,  $p = 0.048$ ). Mortality was also significantly higher in certain ethnic groups (Asian or Pacific Islander, Native American, aOR 2.02,  $p = 0.0014$ ) but lower in the African-American group (aOR = 0.4,  $p = 0.0007$ ) when compared with the Caucasian group. Additionally, mortality was greatest in the south (aOR = 2.27,  $p < 0.0001$ ) and west (aOR = 1.85,  $p = 0.0059$ ) when compared to the northeast region. Mortality increased amongst those of lower median household income, and in those with malignancy ( $p < 0.0001$ ), hepatocellular carcinoma ( $p < 0.0001$ ), heart failure ( $p < 0.0001$ ), and pulmonary circulation disorders ( $p < 0.0001$ ). Interestingly, we found neither cirrhosis nor the type of VTE was a predictor for worse hospital mortality.

### Discussion:

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 outcomes.