Patient Characteristics and In-Hospital Outcomes of Nonalcoholic Steatohepatitis in Patients With Stroke: A Propensity-Matched Analysis

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BACKGROUND

- **Nonalcoholic steatohepatitis (NASH) is the commonest chronic liver disease which affects a large group of general population.**
- **NASH appears to increase risk of ischemic stroke, a leading cause of mortality and disability world-wide.**
- **Moreover, emerging data shows that patient with NASH experience more sever ischemic stroke and have more unfavorable outcomes after an acute ischemic stroke.**

METHODS

- **Adult patients admitted with NASH, with and without Stroke were analyzed from September 2015 to December 2020 using the National Inpatient Sample database.**
- **We used propensity score matching to balance the differences in baseline characteristics and comorbidities between the two groups.**
- **The primary outcome was to determine the burden of stroke in NASH hospitalization.**
- **Secondary outcomes included all- cause in-hospital mortality, length of stay (LOS), and total hospital costs. SAS 9.4 software was used for statistical analysis.**

RESULTS

Unadjusted Analysis with and without stroke in NASH

Variable	NASH with Stroke (n=3645)	NASH without Stroke (n=432,200)	P value
Age, in years (Mean ± SD*)	66.2 ± 11.7	61.8 ± 13.2	< 0.001
Age groups, %			< 0.001
18 - 40 years	2.7%	7.3%	
41 – 60 years	25.8%	33.1%	
61 – 80 years	61%	54.1%	
>80 years	10.4%	5.5%	
Gender, %			0.7
Male	38.3%	38%	
Female	61.7%	61.9%	
Race, %			< 0.001
Caucasians	76.1%	74.7%	
African Americans	5.6%	4.2%	
Others	18.2%	21.1%	
Comorbidities, %			
Hypertension	77.4%	62.4%	< 0.001
Diabetes mellitus	68.2%	61.3%	< 0.001
Congestive heart failure	25.5%	22.1%	< 0.001
CAD*	33.3%	23%	< 0.001
Peripheral Vascular disease	8.5%	4.5%	< 0.001
COPD*	20.2%	22.2%	0.002
Renal failure	25.1%	27.3%	0.002
Coagulopathy	26.9%	32.5%	< 0.001
Obesity	33.7%	36.7%	0.0002
Drug abuse	2.5%	2.4%	0.75
Alcohol abuse	3.6%	3.7%	0.69
Smoking	31.1%	31.9%	0.35
Atrial fibrillation	22.9%	14.2%	< 0.001
Admission Type, %			< 0.001
Emergent	95.%	87.2%	
Elective	4.4%	12.8%	

Propensity Matched Outcomes

In-hospital mortality, %	9.1%	2.9%	< 0.001
Mortality adjusted odds ratio	3.66(2.87 – 4.66)		< 0.001
Length of stay, in days (mean ± SD)	7.6 ± 9.1	6.1 ± 6.9	0.0007
Total hospitalization cost, in US $ (mean ± SD)	25728 ± 43929	17221 ± 31454	< 0.001
Disposition, %			< 0.001
Discharge to home	28.2%	51.9%	
Other	42.9%	17.3%	
Home health care	15.4%	23.1%	
Against medical advice	0.7%	1.1%	

CONCLUSION

- **Our study suggested that incidence of stroke is higher in Caucasians and females with NASH.**
- **In hospital mortality noted to be higher in patients with NASH who suffered from stroke.**
- **It also showed a higher cost burden, higher LOS and increase requirement of inpatient rehab post-hospital discharge among patients with NASH and concurrent stroke.**
- **Thus, it is important to manage patients with NASH more aggressively to prevent stroke. More studies need to be done in this field to establish whether management of NASH will reduce the risk and improve the outcome of stroke.**