Department of Medicine

Impact of Atrial Fibrillation on Inpatient Outcomes of Patients With Liver Cirrhosis: 2017-2018 National Inpatient Sample Database

Rajesh Essrani MD
Lehigh Valley Health Network, rajesh.essrani@lvhn.org

Muhammad Usman Zafar
Lehigh Valley Health Network, muhammad.zafar@lvhn.org

Zahid I. Tarar
University of Missouri

Umer Farooq
Guthrie/Robert Packer Hospital

Shiri Jai Kirshan K. Ravi
University of Tennessee Health Science Center

See next page for additional authors

Follow this and additional works at: https://scholarlyworks.lvhn.org/medicine

Part of the Medicine and Health Sciences Commons

Let us know how access to this document benefits you

Published In/Presented At

Authors

Rajesh Essrani MD, Muhammad Usman Zafar, Zahid I. Tarar, Umer Farooq, Shiri Jai Kirshan K. Ravi, Priyanika Ravi, and Matthew Lincoln

Impact of Atrial Fibrillation on Inpatient Outcomes of Patients With Liver Cirrhosis: 2017-2018 National Inpatient Sample Database

Rajesh Essrani, MD,[1] Muhammad Usman Zafar, MD,[1] Zahid I. Tarar, MD,[2] Umer Farooq, MD,[3] Shri Jai Kirshan K. Ravi, MD,[4] Priyanika Ravi, MBBS,[5] Matthew Lincoln, DO[6]

[1]General Internal Medicine, Lehigh Valley Health Network, PA, [2]General Internal Medicine, University of Missouri School of Medicine, MO, [3]General Internal Medicine, Guthrie/Robert Packer Hospital, PA, [4]Gastroenterology, University of Tennessee Health Science Center, TN, [5]Medical Student, Chandka Medical College, Pakistan, [6]Gastroenterology, Guthrie/Robert Packer Hospital, PA.

Introduction

Atrial fibrillation (AF) is the most common sustained cardiac arrhythmia in medical practice. We conducted this retrospective study to investigate an association between AF and liver cirrhosis (LC).

Methods

The National Inpatient Sample database (2017 and 2018) was used for data analysis to identify patients with the principal diagnosis of LC and a secondary diagnosis of AF. We assessed the in-hospital mortality, length of stay, and total charge in liver cirrhosis patients with and without AF using multivariate logistic and linear regression analysis. Multiple confounders like Charlson comorbidity index (CCI), coronary artery disease, congestive heart failure, smoking, hyperlipidemia, alcohol intake, diabetes mellitus, obesity, myocardial infarction, percutaneous coronary intervention, coronary artery bypass graft, peripheral artery disease, gender, age, race, hospital region, hospital teaching status, hospital bed size, and patients economic status were included to adjust for biases.

Results

410,824 patients were admitted with liver cirrhosis and 32866 had AF and LC. Mean LOS 5.67 days, mean age 57 years, and 39% female.

AF increases odds of mortality in LC patients irrespective of all the confounders stated above (OR) 1.48, p = 0.000, 95% Confidence Interval (CI) 1.33 – 1.65. Factors contributing to higher odds of mortality include alcohol intake, age, weekend admission, patients admitted at teaching hospitals and a larger center.

AF increases mean length of stay by 1.0 days in liver cirrhosis patients independent of all the confounders (p = 0.000, 95% CI 0.68 – 1.14). CHF, obesity, female gender, patients treated at teaching hospital, and patients treated at medium/large sized hospital increases mean LOS.

AF increases mean total hospital charges by $14895 (p = 0.000, 95% CI 9591 – 7716) in liver cirrhosis patients. Patients treated at teaching hospital, and patients treated at medium/large sized hospital increases total charge (Table 1,2,3).

Patients with a higher Charlson Comorbidity Index had increased odds of mortality, LOS, and total inpatient hospital charge.

Discussion

This study highlights the poor outcome of liver cirrhosis patients who develops atrial fibrillation. Limitation of this study includes retrospective analysis, the possibility of incomplete or misclassified diagnoses and unmeasured clinical variables skewing the outcomes that were not considered so larger prospective studies needs to be conducted to understand the outcomes clearly.

Table 1: Mortality

Variables (Mortality)	Coefficient	p-Value	95% Confidence Interval
Atrial Fibrillation	1.48	0.000	1.33–1.66
Charlson Comorbidity Index	1.13	0.000	1.11–1.15
History of Coronary Artery Disease	0.88	0.065	0.78–1.01
History of Congestive Heart Failure	0.93	0.158	0.83–1.03
History of smoking	0.73	0.000	0.67–0.80
Hyperlipidemia	0.73	0.000	0.66–0.81
Alcohol Intake	1.14	0.001	1.05–1.22
Diabetes Mellitus	0.61	0.000	0.54–0.68
Obesity	0.73	0.000	0.65–0.81
Prior Myocardial Infarction	0.76	0.016	0.61–0.95
Percutaneous Coronary Intervention	0.69	0.349	0.32–1.49
Coronary Artery Bypass Graft	0.79	0.073	0.62–1.02
Peripheral Artery Disease	0.85	0.308	0.63–1.16
Weekend Admission	1.12	0.002	1.04–1.21
Age	1.01	0.000	1.01–1.02
Female	0.90	0.002	0.84–0.96
Hospital Teaching Status	1.11	0.009	1.03–1.20
Hospital Bedsize (compared to small)			
Medium	1.08	0.142	097–1.20
Large	1.17	0.000	1.06–1.29

Table 2: Length of Stay

Variables (Length of Stay)	Coefficient	p-Value	95% Confidence Interval
Atrial Fibrillation	0.91	0.000	0.68–1.14
Charlson Comorbidity Index	0.32	0.000	0.29–0.35
History of Coronary Artery Disease	-0.23	0.005	-0.40–-0.07
History of Congestive Heart Failure	0.29	0.007	0.08–0.50
History of smoking	-0.66	0.000	-0.77–-0.55
Hyperlipidemia	-0.50	0.000	-0.62–-0.38
Alcohol Intake	-0.06	0.329	-0.17–0.06
Diabetes Mellitus	-1.16	0.000	-1.28–-1.05
Obesity	0.24	0.001	0.09–0.39
Prior Myocardial Infarction	-0.87	0.000	-1.10–-0.64
Percutaneous Coronary Intervention	-0.34	0.237	-0.91–0.23
Coronary Artery Bypass Graft	-0.60	0.000	-0.83–-0.36
Peripheral Artery Disease	-0.33	0.082	-0.70–0.05
Weekend Admission	-0.06	0.281	-0.17–0.05
Age	-0.02	0.000	-0.03–-0.02
Female	0.22	0.000	0.15–0.32
Hospital Teaching Status	1.11	0.000	0.97–1.24
Hospital Bedsize (compared to small)			
Medium	0.52	0.000	0.36–0.69
Large	1.37	0.000	1.20–1.54

Table 3: Total Hospital Charge

Variable (Total Charge)	Coefficient	p-Value	95% Confidence Intervals
Atrial Fibrillation	14895	0.000	9,591–20,197
Charlson Comorbidity Index	4782	0.000	4,160–5,405
History of Coronary Artery Disease	123	0.940	-3,100–3,346
History of Congestive Heart Failure	-5327	0.070	-11,083–429
History of smoking	-7439	0.000	-10,037–-4,842
Hyperlipidemia	-8056	0.000	-10,512–-5,600
Alcohol Intake	-11974	0.000	-14,821–-9,126
Diabetes Mellitus	-16714	0.000	-19,342–-14,086
Obesity	3292	0.036	218–6,365
Prior Myocardial Infarction	-19003	0.000	-22,806–-15,200
Percutaneous Coronary Intervention	-4370	0.443	-15,528–6,789
Coronary Artery Bypass Graft	-10632	0.000	-14,358–-6,906
Peripheral Artery Disease	-9001	0.000	-13,995–-4,006
Weekend Admission	-604	0.580	-2,744–1,535
Age	-535	0.000	-637–-433
Female	-1979	0.034	-3,808–-150
Hospital Teaching Status	23616	0.000	19,908–27,324
Hospital Bedsize (compared to small)			
Medium	11845	0.000	8,114–1,5576
Large	29959	0.000	25,070–34,847

LVHN.org

Lehigh Valley Health Network