

**Prevalence and Staging of Non-Alcoholic Fatty Liver Disease Among Patients with Heart Failure with Preserved Ejection Fraction**

Alexandria Miller MD\* (2), Jennifer McNamara (3), Scott L. Hummel MD, MS (3, 4), Matthew C. Konerman MD (3), Monica A. Tincopa MD MSc (1)

- (1) Division of Gastroenterology and Hepatology, Department of Internal Medicine, University of Michigan, Ann Arbor, MI
- (2) Department of Internal Medicine, University of Michigan, Ann Arbor, MI
- (3) Division of Cardiovascular Medicine, Department of Internal Medicine, University of Michigan, Ann Arbor, MI
- (4) Ann Arbor Veterans Affairs Health System, Ann Arbor, MI

**Corresponding Author:** Monica A Tincopa, MD MSc; University of Michigan, 1500 East Medical Center Drive, Ann Arbor, MI 48109; [tincopa@med.umich.edu](mailto:tincopa@med.umich.edu)

**Supplemental Table 1. Multivariable Correlated of NAFLD Among Overall Cohort of HFrEF Patients**

Variable	Odds Ratio	95% CI	P Value
Age (per year)	0.99	0.96 -1.03	0.90
Female Gender	1.46	0.65 – 3.27	0.35
BMI (per kg/m <sup>2</sup> )	1.04	0.99 – 1.09	0.05
Diabetes Mellitus	1.77	0.81 – 3.89	0.14
LDL	0.98	0.97 – 0.99	<b>0.04</b>
Severe HF	1.63	0.71 – 3.71	0.24

**Supplemental Table 2. Baseline characteristics of patients with and without abdominal imaging**

Variable	Overall (n = 181)	Imaging (n = 96)	No Imaging (n = 85)	P Value
<b>Demographics</b>				
Age	70 (59 – 77)	69 (58 – 76)	71 (59 – 78)	0.2329
Female Gender	75 (41%)	39 (41%)	36 (42%)	0.8138
Weight (kg)	95.7 (79.4 – 115)	99.2 (80.6 – 114)	93.0 (78.7 – 114.9)	0.4462
BMI (kg/m <sup>2</sup> )	35.1 (28.2 – 42.1)	35.1 (27.8 – 41.4)	34.9 (28.8 – 42.2)	0.8746
<b>Clinical Characteristics</b>				
Hypertension	147 (81%)	78 (81%)	69 (81%)	0.9899
Coronary Artery Disease	75 (41%)	39 (41%)	36 (42%)	0.8138
Diabetes Mellitus	87 (48%)	49 (51%)	38 (45%)	0.3945
Obesity (BMI > 30 kg/m <sup>2</sup> )	125 (69%)	66 (69%)	59 (69%)	0.9234
Atrial Fibrillation	87 (48%)	44 (46%)	43 (50%)	0.5228
Dyslipidemia	119 (66%)	66 (69%)	53 (62%)	0.3654
Statin Use	123 (68%)	67 (70%)	56 (66%)	0.5738
CKD (GFR < 60 mL/min)	96 (53%)	50 (52%)	46 (54%)	0.7843
Anemia	83 (46%)	51 (53%)	32 (38%)	<b>0.0370</b>
<b>Heart Failure Severity</b>				
NYHA Class	n = 176	n = 95	n = 81	
I-II	69 (39%)	33 (35%)	36 (44%)	
III-IV	107 (61%)	62 (65%)	45 (56%)	0.1886
BNP (pg/mL)	117 (52.0 – 260)	102 (32.0 – 199)	165 (63.5 – 365)	<b>0.0054</b>
<b>Echocardiography</b>				
Ejection Fraction (% , n = 172)	60 (60 – 65)	60 (60 – 65)	60 (60 – 65)	0.3253
IVS (mm, n = 160)	10 (9.0 -12)	10 (9 -12)	10 (9 – 13)	0.6623
Left Atrial Diameter (mm, n = 168)	46 (40 – 52)	45 (39 – 50)	47 (42 – 54)	0.0757
RVSP (mm Hg, n = 116)	47 (35 – 58)	42 (34 – 54)	52 (37 – 61)	<b>0.0281</b>
E/A Ratio (n = 104)	1.2 (0.8 – 1.9)	1.1 (0.8 – 1.8)	1.3 (0.9 – 2.0)	0.2288
Diastolic Dysfunction (n = 91)		n = 49	n = 42	
Grade 0-1 or indeterminate	53 (58%)	31 (63%)	22 (52%)	0.2939
Grade ≥ 2	38 (42%)	18 (37%)	20 (48%)	
RV Systolic Dysfunction (n = 166)	23 (14%)	9 (10%)	14 (18%)	0.1507
<b>Metabolic Evaluation</b>				
Total Cholesterol (mg/dL, n = 156)	156 (124 – 184)	150 (122 – 173)	167 (127 – 197)	<b>0.0361</b>
Triglycerides (mg/dL, n = 156)	124 (88 – 170)	106 (82 – 158)	136 (98 – 178)	0.0945
HDL (mg/dL, n = 156)	46 (38 – 59)	45 (36 – 54)	46 (40 – 60)	0.3851
LDL (mg/dL, n = 156)	76 (60-97)	71 (55 – 90)	84 (69 – 106)	<b>0.0157</b>
A1c (% , n = 131)	6.2 (5.7 – 7.6)	6.3 (5.7 – 7.6)	6.2 (5.8 – 7.6)	0.8701
<b>Hepatic Evaluation</b>				
Platelets (K/uL, n = 178)	215 (176 - 268)	216 (181 – 272)	214 (168 – 264)	0.6716
AST (IU/L, n = 179)	26 (20 – 31)	26 (20 – 32)	26 (20 – 31)	0.8170
ALT (IU/L, n = 179)	23 (17 – 32)	23 (17 – 30)	24 (17 – 32)	0.4831

INR (n = 160)	1.1 (1.0 – 1.4)	1.1 (1.0 – 1.3)	1.1 (1.0 – 1.5)	0.9154
Total Bilirubin (mg/dL, n = 178)	0.5 (0.4 – 0.8)	0.5 (0.4 – 0.8)	0.5 (0.3 – 0.8)	0.8589
Albumin (g/dL, n = 178)	4.1 (3.9 – 4.4)	4.2 (3.8 – 4.4)	4.1 (3.9 – 4.4)	0.9918
FIB-4 (n = 160)	1.6 (1.2 – 2.5)	1.6 (1.1 – 2.3)	1.8 (1.2 – 2.7)	0.5902
NFS (n = 159)	0.33 (-0.72 – 1.4)	0.32 (-0.82 – 1.4)	0.34 (-0.50 – 1.4)	0.7316

\*Continuous variables presented as median with interquartile range.