Clinical Outcomes of NAFLD/NASH in HF-CKD-T2DM

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## Preamble:

* **Data Source**: Cross-sectional analysis of the National Inpatient Sample (NIS) from 2018 to 2020.
* **Patient Selection**: Included all inpatient admissions with HF-CKD-T2DM.
* **HF-CKD-T2DM + NAFLD/NASH Categories**:
  + HF-CKD-T2DM with NAFLD/NASH
  + HF-CKD-T2DM without NAFLD/NASH
* **Primary Outcomes**:
  + In-hospital all-cause mortality
  + Total hospital length of stay (days)
  + Total charge, inflation adjusted to 2020 ($)
* **Software:** All analyses were performed using R Version 4.4.1 (R Foundation for Statistical Computing, Vienna, Austria)

## Baseline Table:

| **Characteristic** | **With NAFLD/NASH** N = 10*1* | **Without NAFLD/NASH** N = 1,815*1* | **p-value***2* |
| --- | --- | --- | --- |
| Age, y | 61 (1) | 71 (12) | <0.001 |
| Sex |  |  | >0.9 |
| Female | 5 (50%) | 860 (47%) |  |
| Male | 5 (50%) | 955 (53%) |  |
| Race |  |  | >0.9 |
| White | 5 (50%) | 1,095 (62%) |  |
| Asian or Pacific Islander | 0 (0%) | 50 (2.8%) |  |
| Black | 5 (50%) | 370 (21%) |  |
| Hispanic | 0 (0%) | 175 (9.9%) |  |
| Native American | 0 (0%) | 20 (1.1%) |  |
| Other | 0 (0%) | 65 (3.7%) |  |
| Charlson comorbidity index | 6.50 (2.12) | 6.12 (1.38) | 0.8 |
| Residential income |  |  | 0.6 |
| $1 - $51,999 | 10 (100%) | 660 (37%) |  |
| $52,000 - $65,999 | 0 (0%) | 460 (26%) |  |
| $66,000 - $87,999 | 0 (0%) | 360 (20%) |  |
| $88,000 or more | 0 (0%) | 320 (18%) |  |
| Expected primary payer |  |  | 0.3 |
| Private | 0 (0%) | 240 (13%) |  |
| Medicaid | 5 (50%) | 125 (6.9%) |  |
| Medicare | 5 (50%) | 1,375 (76%) |  |
| Other | 0 (0%) | 65 (3.6%) |  |
| Hospital region |  |  | 0.6 |
| Midwest | 0 (0%) | 165 (9.1%) |  |
| Northeast | 0 (0%) | 585 (32%) |  |
| South | 10 (100%) | 1,065 (59%) |  |
| *1*Mean (SD); n (%) | | | |
| *2*Design-based KruskalWallis test; Pearson's X^2: Rao & Scott adjustment | | | |

## Outcomes Table:

| **Characteristic** | **With NAFLD/NASH** N = 10*1* | **Without NAFLD/NASH** N = 1,815*1* | **p-value***2* |
| --- | --- | --- | --- |
| Died during hospitalization | 0 (0%) | 110 (6.1%) | 0.8 |
| Length of stay (days) | 13.0 (15.6) | 6.6 (6.1) | 0.9 |
| Inflation-adjusted total charge ($) | 119,518 (85,297) | 65,247 (86,916) | 0.018 |
| *1*n (%); Mean (SD) | | | |
| *2*Pearson's X^2: Rao & Scott adjustment; Design-based KruskalWallis test | | | |

## Multivariable Logistic Regression:

### All-Cause Mortality:

| **Characteristic** | **OR***1* | **95% CI***1* | **p-value** |
| --- | --- | --- | --- |
| NASH/NAFLD categories |  |  |  |
| With NAFLD/NASH | — | — |  |
| Without NAFLD/NASH | 17,513,264 | 1,889,499, 162,325,832 | <0.001 |
| Age, y | 1.01 | 0.94, 1.09 | 0.7 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 1.44 | 0.58, 3.55 | 0.4 |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 7.14 | 1.34, 38.2 | 0.023 |
| Black | 1.49 | 0.41, 5.43 | 0.5 |
| Hispanic | 0.00 | 0.00, 0.00 | <0.001 |
| Native American | 0.00 | 0.00, 0.00 | <0.001 |
| Other | 5.28 | 1.00, 28.0 | 0.051 |
| Charlson comorbidity index | 1.17 | 0.80, 1.71 | 0.4 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 0.43 | 0.09, 2.10 | 0.3 |
| $66,000 - $87,999 | 0.45 | 0.06, 3.46 | 0.4 |
| $88,000 or more | 2.12 | 0.84, 5.35 | 0.11 |
| Expected primary payer |  |  |  |
| Private | — | — |  |
| Medicaid | 5.21 | 0.30, 92.1 | 0.2 |
| Medicare | 4.31 | 0.24, 78.5 | 0.3 |
| Other | 0.00 | 0.00, 0.00 | <0.001 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 25,631,795 | 9,974,641, 65,865,922 | <0.001 |
| South | 9,593,972 | 3,548,550, 25,938,560 | <0.001 |
| *1*OR = Odds Ratio, CI = Confidence Interval | | | |

## Multivariable Linear Regression:

### Length of Stay:

| **Characteristic** | **Beta** | **95% CI***1* | **p-value** |
| --- | --- | --- | --- |
| NASH/NAFLD categories |  |  |  |
| With NAFLD/NASH | — | — |  |
| Without NAFLD/NASH | -6.0 | -24, 12 | 0.5 |
| Age, y | 0.02 | -0.06, 0.10 | 0.6 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 0.45 | -0.87, 1.8 | 0.5 |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | -0.70 | -2.9, 1.5 | 0.5 |
| Black | -0.47 | -2.2, 1.3 | 0.6 |
| Hispanic | 0.61 | -1.6, 2.8 | 0.6 |
| Native American | -0.82 | -6.2, 4.6 | 0.8 |
| Other | -1.5 | -4.1, 0.99 | 0.2 |
| Charlson comorbidity index | -0.27 | -0.74, 0.21 | 0.3 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | 0.16 | -1.8, 2.1 | 0.9 |
| $66,000 - $87,999 | 0.55 | -1.8, 2.9 | 0.6 |
| $88,000 or more | -0.68 | -3.8, 2.5 | 0.7 |
| Expected primary payer |  |  |  |
| Private | — | — |  |
| Medicaid | 1.2 | -1.5, 3.9 | 0.4 |
| Medicare | -0.35 | -3.2, 2.5 | 0.8 |
| Other | 0.83 | -3.6, 5.2 | 0.7 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 1.1 | -1.2, 3.4 | 0.3 |
| South | 1.6 | -0.15, 3.3 | 0.072 |
| *1*CI = Confidence Interval | | | |

### Inflation Adjusted Total Charge:

| **Characteristic** | **Beta** | **95% CI***1* | **p-value** |
| --- | --- | --- | --- |
| NASH/NAFLD categories |  |  |  |
| With NAFLD/NASH | — | — |  |
| Without NAFLD/NASH | -40,156 | -138,641, 58,329 | 0.4 |
| Age, y | 16 | -1,354, 1,385 | >0.9 |
| Sex |  |  |  |
| Female | — | — |  |
| Male | 6,467 | -12,310, 25,245 | 0.5 |
| Race |  |  |  |
| White | — | — |  |
| Asian or Pacific Islander | 4,497 | -31,851, 40,844 | 0.8 |
| Black | -6,572 | -34,816, 21,672 | 0.6 |
| Hispanic | 14,083 | -17,790, 45,957 | 0.4 |
| Native American | 3,922 | -76,017, 83,861 | >0.9 |
| Other | 16,758 | -24,129, 57,645 | 0.4 |
| Charlson comorbidity index | -159 | -6,149, 5,830 | >0.9 |
| Residential income |  |  |  |
| $1 - $51,999 | — | — |  |
| $52,000 - $65,999 | -9,110 | -44,328, 26,108 | 0.6 |
| $66,000 - $87,999 | 1,121 | -40,813, 43,054 | >0.9 |
| $88,000 or more | -15,593 | -60,995, 29,809 | 0.5 |
| Expected primary payer |  |  |  |
| Private | — | — |  |
| Medicaid | 10,042 | -28,328, 48,412 | 0.6 |
| Medicare | -20,145 | -67,693, 27,402 | 0.4 |
| Other | -7,424 | -77,521, 62,673 | 0.8 |
| Hospital region |  |  |  |
| Midwest | — | — |  |
| Northeast | 22,613 | 237, 44,989 | 0.048 |
| South | 24,817 | 9,082, 40,552 | 0.003 |
| *1*CI = Confidence Interval | | | |