



Racial/Ethnic Disparities in Long-Term Risks of Cirrhosis Among U.S. Veterans with Metabolic Dysfunction Associated Fatty Liver Disease



Aaron Yeoh¹, Zeyuan Yang², Ramsey Cheung^{1,2}, Robert J. Wong^{1,2}

¹Division of Gastroenterology, Department of Medicine, Stanford, CA
²Gastroenterology Section, Veterans Affairs Palo Alto Health Care System, Palo Alto, CA

Introduction

- Fatty liver disease is strongly correlated with cardiometabolic risk factors such as obesity, diabetes mellitus, hypertension and dyslipidemia.
- Metabolic dysfunction-associated fatty liver disease (MAFLD) is a recently proposed nomenclature that comprehensively captures the complex metabolic co-morbidities contributing to fatty liver¹.
- Our prior work has found that the prevalence of MAFLD in the U.S. population is around 35%².
- The long-term risks of advanced fibrosis (AF) or cirrhosis in MAFLD patients is not well understood. U.S. Veterans have a high prevalence of fatty liver and metabolic diseases, and this cohort is ideal to evaluate MAFLD outcomes³.
- We evaluated prevalence and predictors of AF and cirrhosis among a national cohort of U.S. Veterans with MAFLD.

Methods

- Adult Veterans with MAFLD were identified using data from the 2010-2021 Veterans Affairs Corporate Data Warehouse, which captures national data on over 6 million Veterans receiving health care across the U.S..
- MAFLD was identified using established definitions:
 - presence of hepatic steatosis plus ≥ 1 of the following:
 - 1) obesity,
 - 2) concurrent diabetes mellitus, or
 - 3) >2 metabolic risk factors (hypertension, hypertriglyceridemia, low levels of high-density lipoprotein, insulin resistance, or high-sensitivity C-reactive protein >2 mg/L).
- Cumulative incidence of AF (fibrosis-4 score >2.67) or cirrhosis (based on ICD-9/10) over a 10-year period was stratified by age, sex, race/ethnicity and other risk factors.
- Adjusted multivariate Cox proportional hazards models evaluated for predictors of AF or cirrhosis among MAFLD patients.

References

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Results: Advanced Fibrosis

- Overall prevalence of MAFLD among U.S. Veterans was 56.2% (n=2,862,670), among whom the cumulative 10-year incidence of AF was 8.35% and of cirrhosis was 1.69% (Table 1 & 2).
- Compared to males, females had significantly lower risks of AF (2.46% vs 8.94%, HR 0.55, 95% CI 0.53-0.57).
- Compared to non-Hispanic whites, significantly higher risk of cirrhosis was observed in American Indian/Alaska Natives (HR 1.18, 95% CI 1.10-1.25), Hispanics (HR 1.09, 95% CI 1.07-1.11) and African Americans (HR 1.09, 95% CI 1.07-1.10), whereas no significant difference was seen in Asians or Pacific Islanders.
- Significantly higher risk of advanced fibrosis was seen in those with diabetes (HR 1.07, 95% CI 1.06-1.08).
- Compared to individuals without HIV, those with HIV had a nonsignificant trend towards lower incidence of fibrosis and higher incidence of cirrhosis.

Table 1: Cumulative incidence of advanced fibrosis in U.S. Veterans with MAFLD over 10-year period

| | 10-year | 95% CI | 10-year p-value |
|---|---------|----------------|-----------------|
| Total | 8.35% | 8.31%, 8.38% | n/a |
| Female | 2.46% | 2.39%, 2.52% | ref |
| Male | 8.94% | 8.90%, 8.98% | <0.0001 |
| Non-Hispanic White | 8.87% | 8.82%, 8.91% | ref |
| Black or African American | 6.72% | 6.65%, 6.79% | <0.0001 |
| Hispanic | 7.42% | 7.30%, 7.53% | <0.0001 |
| Asian or Pacific Islander | 5.11% | 4.90%, 5.31% | <0.0001 |
| American Indian or Alaska Native | 7.71% | 7.34%, 8.07% | <0.0001 |
| No Diabetes | 7.12% | 7.08%, 7.16% | ref |
| Diabetes | 11.40% | 11.33%, 11.48% | <0.0001 |
| No HIV | 8.35% | 8.32%, 8.38% | ref |
| HIV | 5.22% | 4.28%, 6.16% | <0.0001 |

Contact

- Corresponding author for poster: Aaron Yeoh, MD. ayeoh@stanford.edu

Results: Cirrhosis

- Compared to males, females had significantly lower risks cirrhosis (0.72% vs 1.79%, HR 0.53, 95% CI 0.50-0.57).
- Compared to non-Hispanic whites, significantly higher risk of cirrhosis was observed in American Indian/Alaska Natives (HR 1.28, 95% CI 1.14-1.43) and Hispanics (HR 1.14, 95% CI 1.09-1.18),
- Lower risk of cirrhosis was seen in Asians or Pacific Islanders (HR 0.74, 95% CI 0.66-0.82) and African Americans (HR 0.85, 95% CI 0.83-0.88).
- Significantly higher risk of cirrhosis was seen in those with diabetes (HR 1.68, 95% CI 1.64-1.72).

Table 2: Cumulative incidence of cirrhosis in U.S. Veterans with MAFLD over 10-year period

| | 10-year | 95% CI | 10-year p-value |
|---|---------|--------------|-----------------|
| Total | 1.69% | 1.68%, 1.71% | n/a |
| Female | 0.72% | 0.69%, 0.76% | ref |
| Male | 1.79% | 1.77%, 1.80% | <0.0001 |
| Non-Hispanic White | 1.70% | 1.68%, 1.72% | ref |
| Black or African American | 1.68% | 1.64%, 1.71% | 0.28 |
| Hispanic | 1.98% | 1.92%, 2.04% | <0.0001 |
| Asian or Pacific Islander | 1.08% | 0.99%, 1.18% | <0.0001 |
| American Indian or Alaska Native | 2.12% | 1.93%, 2.31% | <0.0001 |
| No Diabetes | 1.29% | 1.27%, 1.30% | ref |
| Diabetes | 2.68% | 2.64%, 2.71% | <0.0001 |
| No HIV | 1.69% | 1.68%, 1.71% | ref |
| HIV | 2.20% | 1.59%, 2.81% | 0.1 |

Conclusions

- Among a national cohort of U.S. Veterans with MAFLD, overall 10-year incidence of AF was 8.35% and of cirrhosis was 1.69%.
- Significant racial/ethnic disparities in long-term risks of AF and cirrhosis were observed, with highest risk of cirrhosis in Hispanics and American Indian/Alaska Natives, whereas lowest risk among Asians.