

# NEWSLETTER APRIL 2024

## RESEARCH PUBLICATION



### AIR POLLUTION ASSOCIATE WITH ADVANCED HEPATIC FIBROSIS AMONG PATIENTS WITH CHRONIC LIVER DISEASE

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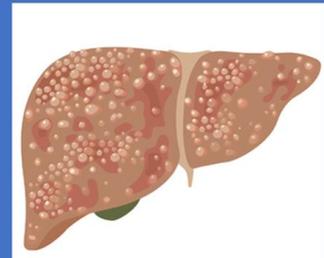
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Air pollution measurement  
in a township of Southern Taiwan



If mean PM 2.5  $\geq$   
30  $\mu\text{g}/\text{m}^3$  per year



Advanced fibrosis  $\rightarrow$   
OR/CI: 2.35/1.52–3.64;  $P < 0.001$

#### Objective

We aimed to investigate the association between air pollution and advanced fibrosis among patients with metabolic associated fatty liver disease (MAFLD) and chronic hepatitis B virus (HBV) and hepatitis C virus (HCV) infections.

#### Design

A total of 1,376 participants who were seropositive for HBV surface antigen (HBsAg) or antibodies to HCV (anti-HCV) or had abnormal liver function in a community screening program from 2019 to 2021 were enrolled for the assessment of liver fibrosis using transient elastography. Daily estimates of air pollutants (particulate matter  $\leq 2.5 \mu\text{m}$  in diameter (PM<sub>2.5</sub>), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>) and benzene) were aggregated into mean estimates for the previous year based on the date of inclusion.

#### Results

Of the 1,376 participants, 767 (52.8%) and 187 (13.6) had MAFLD and advanced fibrosis, respectively. A logistic regression analysis revealed that the factors associated with advanced liver fibrosis were HCV viremia (odds ratio [OR], 3.13; 95% confidence interval (CI), 2.05–4.77;  $P < 0.001$ ), smoking (OR, 1.79; 95% CI, 1.16–2.74;  $P = 0.01$ ), age (OR, 1.04; 95% CI, 1.02–1.05;  $P < 0.001$ ) and PM2.5 (OR, 1.10; 95% CI, 1.05–1.16;  $P < 0.001$ ). Linear regression analysis revealed that LSM was independently correlated with PM2.5 ( $\beta$ : 0.134; 95% CI: 0.025, 0.243;  $P = 0.02$ ). There was a dose-dependent relationship between different fibrotic stages and the PM2.5 level (the PM2.5 level in patients with fibrotic stages 0, 1-2 and 3-4: 27.9, 28.4, 29.3  $\mu\text{g}/\text{m}^3$ , respectively; trend  $P < 0.001$ ).

## Conclusions

Exposure to PM2.5, as well as HBV and HCV infections, is associated with advanced liver fibrosis in patients with MAFLD. There was a dose-dependent correlation between PM2.5 levels and the severity of hepatic fibrosis.

**Keywords: MAFLD, HBV, HCV, Transient elastography; advanced liver fibrosis; air pollution; PM2.5**

### WHAT IS ALREADY KNOWN ON THIS TOPIC:

- Air pollution can cause multiple diseases; however, the effects of air pollution on patients with chronic liver disease have not been thoroughly investigated.

### WHAT THIS STUDY ADDS:

- PM2.5 levels are positively correlated with advanced fibrosis not only in patients with MAFLD but also among those with chronic hepatitis.
- CHB patients with metabolically associated fatty liver disease (MAFLD) had a higher risk of advanced fibrosis than those without MAFLD.

### HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY:

- HCV associated with metabolic dysfunction and MAFLD might be a threat after HCV eradication. Therefore, it is necessary to evaluate the confounding effects of HBV or HCV infection on the severity of MAFLD.
- Further studies are required to determine the long-term outcomes of MAFLD patients in the setting of air pollution.



