

Mediterranean diet may blunt air pollution's ill health effects

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Mediterranean diet may blunt air pollution's ill health effects. Credit: ATS

Eating a Mediterranean diet may protect people from some of the harm

of long-term exposure to air pollution, and reduce their risk of dying from heart attacks, stroke and other causes of death, according to new research presented at the ATS 2018 International Conference.

"Previous studies have shown that dietary changes, particularly the addition of antioxidants, can blunt the adverse effects of [exposure](#) to high levels of [air pollution](#) over short time periods," said Chris C. Lim, MS, a doctoral student at the NYU School of Medicine. "What we did not know was whether [diet](#) can influence the association between long-term [air pollution exposure](#) and health effects."

Rich in antioxidants, the Mediterranean diet favors fruits, vegetables, whole grains, legumes, olive oils, fish and poultry over red meat and processed foods. Antioxidants are molecules that disarm oxidized and highly reactive molecules, or free radicals, that are known to cause cell and tissue damage.

The researchers analyzed data from the National Institutes of Health (NIH)-American Association of Retired Persons (AARP) Diet and Health Study. Over 17 years, the study followed 548,699 people (average age 62 at enrollment) from 6 states—California, North Carolina, New Jersey, Florida, Louisiana and Pennsylvania—and two cities—Atlanta and Detroit. During that time, 126,835 people in the study group died.

The researchers created five groups of participants based on their level of adherence to a Mediterranean diet and linked participants to estimates of long-term exposure to fine particulate matter (PM_{2.5}), nitrous oxide (NO₂) and ozone (O₃) based on census tract information.

When comparing those least and most adherent to a Mediterranean diet, the study found that:

- Deaths from all causes increased by 5 percent for every 10 parts

per billion (ppb) increase in long-term average NO₂ exposure in those least adherent, compared to 2 percent among the most adherent.

- Cardiovascular disease deaths increased by 17 percent for every 10 micrograms per cubic meter (µg/m³) increase in long-term average PM_{2.5} exposure in those least adherent, compared to 5 percent among the most adherent.
- Cardiovascular disease deaths increased by 10 percent for every 10 ppb increase in NO₂ exposure in those least adherent, compared to 2 percent among the most adherent.
- Heart attack deaths increased by 20 percent for every 10 µg/m³ increase in PM_{2.5} exposure in those least adherent, compared to 5 percent among the most adherent.
- Heart attack deaths increased by 12 percent for every single ppb increase in NO₂ exposure in those least adherent, compared to 4 percent among the most adherent.

Adherence to a Mediterranean diet did not appear, however, to protect against the harmful effects of long-term exposure to O₃. The diet did not reduce deaths from all causes, heart attack or other cardiovascular diseases associated with O₃ exposure.

"Given the benefits we found of a diet high in anti-oxidants, our results are consistent with the hypothesis that particle air pollution caused by fossil fuel combustion adversely affects health by inducing oxidative stress and inflammation," said senior study author George Thurston, ScD, director of the Program in Exposure Assessment and Human Health Effects at the Department of Environmental Medicine, NYU School of Medicine. "On the other hand, the ozone effect was not significantly blunted by a Mediterranean diet, so ozone apparently affects cardiac health through a different mechanism."

With about one-fourth of the study population living where air pollution

levels were 10 $\mu\text{g}/\text{m}^3$ or more above the lowest exposure, he added, "adoption of a Mediterranean diet has the potential to reduce the effects of air pollution in a substantial population in the United States."

Study limitations include only having dietary information from the point when participants enrolled in the study and enrolling a higher percentage of white and well-educated Americans than are represented in the U.S. population as a whole.

More information: Abstract 17198: Air Pollution, Mediterranean Diet, and Cause-Specific Mortality Risk in the NIH-AARP Diet and Health Study

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