Highway Proximity Associated with Cardiovascular Disease Risk

By Sherry Hou

Background

Air pollution caused by traffic can be harmful to human health. Pollutants from highways have a greater effect on those who live closest (less than 200m). One of these traffic pollutants is ultrafine particles (UFP). UFP are extremely small particles less than four millionths of an inch. Because of its size, UFP can easily enter a person’s lungs when breathed in and pass into the blood stream. Some scientists suspect that chronic exposure to UFP may be damaging to one’s cardiovascular health. People who live closer to the highway are exposed at higher concentration and for longer periods to potentially harmful pollutants.

How was it done?

The study collected blood samples from 260 CAFEH participants who were living in Dorchester, South Boston, and Somerville and were over the age of 40. The researchers then examined four substances in blood that are linked to cardiovascular disease (CVD): C-Reactive Protein (hsCRP), Interleukin-6 (IL-6), Tumor Necrosis Factor alpha receptor II (TNF-RII), and fibrinogen. The goal was to investigate the relationship between levels of these blood markers and how close the participants live to the highway.

The participants’ addresses were mapped by a geographic information system (GIS) to figure out the distance between the participants’ residence and the I-93 highway. The distance from I-93 was divided into categories of 0–50m, 50-150m, 150-250m, 250-450m, and ≥1000m (urban background).

The level of UFP was measured by an air pollution monitor in a recreational vehicle that went around the neighborhoods to measure UFP level. The CAFEH project also administered a survey to participants asking them about their physical activity, time spent outside, diet, medication, socio-economic status, and other factors that may influence the participant’s exposure to UFP and CVD risk. Taking all these things into consideration, the study compared the levels of
these blood markers according to the participants distance from the highway.

What did they find?

The researchers found that there was an association between how far the participants were living from the highway and the level hsCRP and IL-6 when controlling for many other risk factors, but little or no association with fibrinogen or TNF-RII. In other words, the participants who live closer to the highway have higher levels of hsCRP and IL-6, suggesting that people who live closer to the highway may be at higher risk of developing heart diseases. When examining the levels of UFP detected surrounding the highway, the researchers also found that the UFP level was higher closer to the highway.

What can you do?

If you live close to the highway, you might want to consider shutting the windows when you can and spending less time outside when traffic is heavy. Meanwhile, using public transportation will help reduce traffic pollutants. Supporting local officials and community partners who are involved in and advocate for cleaner air can also be a good way to make a difference.

For More Information, Contact:

Doug Brugge, PhD, MS

Department of Public Health and Community Medicine
Tufts University School of Medicine
136 Harrison Ave., Boston, MA
Email: dbrugge@aol.com

This study was funded by:

National Institute of Environmental Health

To learn more about this research, please refer to the following source: