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Traffic fumes linked to build-up of heart disease

Living near heavy traffic plays a role in the progression of coronary disease, signalling that traffic pollution does more than just activate existing heart problems

(Source: FreeDigitalPhotos.net)

Air pollution from traffic contributes to heart trouble. Over time, exposure raises the risk of dying or occurrence of heart disease, but it is unclear whether this results from a steady build-up of the disease, or from short-term effects after bouts of pollution. An association between hardening of the arteries (atherosclerosis) and living near major roads, reported this week in *Circulation*, now suggests that gradual development of heart disease is connected to long-term exposure to traffic fumes.

“We have demonstrated for the first time that residential exposure to highly trafficked roads is associated with coronary atherosclerosis in a population-based study,” conclude the authors, led by Barbara Hoffman of the University Hospital Essen in Germany. “A positive exposure–response relationship for increasing traffic exposure and similar results independent of [coronary heart disease] status and individual characteristics strengthen our findings.”

The authors examined volunteers ranging from 45 to 74 years of age to detect plaques building up in their arteries, and assessed their residential exposure to traffic pollution. The risk of coronary atherosclerosis, which reflects lifetime exposures to pollution, was significantly lower for participants living more than 200 metres away from a major road, compared with those living less than 100 metres away. The chance of having plaques increased the closer the person’s home was to a busy road.

“Considering the continuing rise in motorized vehicle use and the paramount role of coronary atherosclerosis in morbidity and mortality, these findings have high public health relevance and should be corroborated in prospective studies,” the authors conclude.

This is the second study to suggest that air pollution might be added to

the list of causes for atherosclerosis, notes Nino Künzli, Research Professor with the Center for Research in Environmental Epidemiology in Barcelona. “If true, the interpretation is indeed that pollution contributes to the underlying disease processes of atherogenesis, and not just to triggering of infarction and death,” he says. “This was for sure not expected some 15 years ago.”

According to Künzli, these findings cannot be explained plausibly by the temporary effects of recent exposure to pollution. The measure of coronary atherosclerosis used in the study is not sensitive to short-term changes in risk, so there must be some continuing pathology at play. “This is a very important work focusing unambiguously on a measure of atherosclerosis and long-term exposure, which must be interpreted as a chronic effect of long-term exposure such as those typically encountered if one lives very close to busy roads,” he comments.

The study is important and evaluates a link suggested by animal research, says Francesco Forastiere of the Department of Epidemiology at the local health authority in Rome. “The novelty of the study is the measurement of the degree of atherosclerosis with a non-invasive technique in a large, well-characterized cohort.”

The measure of cardiovascular risk used in the study is a good predictor of clinical events, according to the authors, and the link with air pollution is credible from a biological perspective. When specific measurements for fine particulate pollution were used, the associations were weaker but remained consistent with the study’s findings. These did not change regardless of differences in people’s lifestyle or other factors that can influence the risk.

“The duration of the study is short but it is likely that subjects were exposed long before the start of the study,” says Forastiere. Scientists examined the participants over a period of three years, between 2000 and 2003. Although the follow-up time is adequate, Künzli notes, “longer follow-up would have increased the power to also clarify some of the results that did just not reach statistical significance.”

References

1. Hoffmann B, Moebus S, Mohlenkamp S, Stang A, Lehmann N, Dragano N *et al.* Residential exposure to traffic is associated with coronary atherosclerosis. *Circulation* 2007. **doi: 10.1161/CIRCULATIONAHA.107.693622**