Stroke and Long-Term Exposure to Outdoor Air Pollution From Nitrogen Dioxide A Cohort Study

**Background and Purpose**
Years of exposure to tobacco smoke substantially increase the risk for stroke. Whether long-term exposure to outdoor air pollution can lead to stroke is not yet established. We examined the association between long-term exposure to traffic-related air pollution and incident and fatal stroke in a prospective cohort study.

**Methods**
We followed 57,053 participants of the Danish Diet, Cancer and Health cohort in the Hospital Discharge Register for the first-ever hospital admission for stroke (incident stroke) between baseline (1993-1997) and 2006 and defined fatal strokes as death within 30 days of admission. We associated the estimated mean levels of nitrogen dioxide at residential addresses since 1971 to incident and fatal stroke by Cox regression analyses and examined the effects by stroke subtypes: ischemic, hemorrhagic, and nonspecified stroke.

**Results**
Over a mean follow-up of 9.8 years of 52,215 eligible subjects, there were 1984 (3.8%) first-ever (incident) hospital admissions for stroke of whom 142 (7.2%) died within 30 days. We detected borderline significant associations between mean nitrogen dioxide levels at residence since 1971 and incident stroke (hazard ratio, 1.05; 95% CI, 0.99-1.11, per interquartile range increase) and stroke hospitalization followed by death within 30 days (1.22; 1.00-1.50). The associations were strongest for nonspecified and ischemic strokes, whereas no association was detected with hemorrhagic stroke.

**Conclusions**
Long-term exposure to traffic-related air pollution may contribute to the development of ischemic but not hemorrhagic stroke, especially severe ischemic strokes leading to death within 30 days.

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