

Traffic noise increases the risk of having a stroke

January 26 2011

Exposure to noise from road traffic can increase the risk of stroke, particularly in those aged 65 years and over, according to a study published online today (Wednesday 26 January) in the *European Heart Journal*.

The study, which is the first to investigate the links between road traffic noise and the risk of stroke, found that for every 10 [decibels](#) more noise the risk of having a stroke increased by 14% among the 51,485 study participants. When the Danish researchers looked at the data more closely, they found that for people aged less than 65 years there was no statistically significant increased risk of stroke; however, the risk increased by 27% for every 10dB of higher road traffic noise in those aged 65 years and over. Furthermore, in the older people they found indications of a threshold limit at approximately 60 dB, above which the risk for stroke seemed to increase even more.

Dr Mette Sørensen, senior researcher at the Institute of Cancer Epidemiology, Danish Cancer Society in Copenhagen, Denmark, who led the research, said: "Our study shows that exposure to road traffic noise seems to increase the risk of stroke. Previous studies have linked traffic noise with raised blood pressure and heart attacks, and our study adds to the accumulating evidence that traffic noise may cause a range of cardiovascular diseases. These studies highlight the need for action to reduce people's exposure to noise.

"This is the first study ever to investigate the association between

exposure to road traffic noise and risk of stroke, and, therefore, more research is needed before any firm conclusions can be made."

The study was based on the Danish "Diet, Cancer, and Health" cohort study, which recruited a total of 57,053 people aged between 50 and 64, in the Copenhagen and Aarhus areas between 1993 and 1997. Medical and residential histories were available for 51,485 of the participants and their average follow-up time was ten years. A total of 1,881 suffered a stroke in this time.

Dr Sørensen and her colleagues made allowances in their calculations for the effect of air pollution, exposure to railway and aircraft noise, as well as a range of other confounding life-style factors such as smoking, diet, alcohol and caffeine consumption. Data on the study participants and where they lived were linked to a noise calculation program that has been used to map noise levels in a variety of locations in Scandinavia for several years. The program takes account of traffic composition and speed, road type (motorways, rural highways etc) and surfaces, building polygons and the position and heights of people's homes above the roads.

At the time of joining the cohort 35% of people were exposed to noise levels greater than 60dB, and 72% lived at the same address throughout the period of the study. The researchers' lowest estimate for noise exposure was 40dB and the highest was 82dB.

Dr Sørensen said: "If we assume that our findings represent the true risk, and the association between traffic noise and stroke is causal, then an estimated eight percent of all stroke cases, and 19% of cases in those aged over 65, could be attributed to road traffic noise. The population in this study, however, lived mainly in urban areas and is, therefore, not representative of the whole population in terms of exposure to road traffic noise. However, if we take the exposure distribution of all dwellings in Denmark into account, we find that about 600 new cases of

stroke could be attributed to road traffic noise in Denmark each year. There are 5.5 million inhabitants in Denmark and a total of 12,400 new cases of stroke each year."

As the study is epidemiological it cannot show that road traffic noise is the cause of the increased risk of stroke, only that there is an association. The mechanism by which noise could increase the risk of a range of cardiovascular problems is still unclear.

"The mechanisms involved are probably the same mechanisms believed to be involved in noise-induced hypertension and heart attacks, namely that noise acts as a stressor and disturbs sleep, which results in increased blood pressure and heart rate, as well as increased level of stress hormones. Taken together, all of these could increase the risk for cardiovascular diseases," she said.

"In addition, older people tend to have more fragmented sleep patterns and are more susceptible to sleep disturbances. This could explain why the association between road traffic noise and risk of [stroke](#) was seen mainly in the oldest participants."

Dr Sørensen plans to carry out further research into the effects of noise on a range of cardiovascular diseases and raised blood pressure.

More information: "Road traffic noise and stroke: a prospective cohort study". *European Heart Journal*. [doi:10.1093/eurheartj/ehq466](https://doi.org/10.1093/eurheartj/ehq466)

Provided by European Society of Cardiology

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