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Myocardial Infarction Risk Due to Aircraft, Road, and Rail Traffic Noise.

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Abstract

BACKGROUND: Traffic noise can induce stress reactions that have effects on the cardiovascular system. The exposure-risk relationship between aircraft, road, and rail traffic noise and myocardial infarction is currently unknown.

METHODS: 19 632 patients from the Rhine-Main region of Germany who were diagnosed with myocardial infarction in the years 2006-2010 were compared with 834 734 control subjects. The assignment of persons to groups was performed on the basis of billing and prescription data from three statutory health insurance carriers. The exposure of all insurees to aircraft, road, and rail traffic noise in 2005 was determined from their residence addresses. As estimators of risk, odds ratios (OR) were calculated by logistic regression analysis, with adjustment for age, sex, regional social status variables, and individual social status (if available). The evaluation was performed on the basis of the continuous 24-hour noise level and the categorized noise level (in 5 decibel classes).

RESULTS: The linear model revealed a statistically significant risk increase due to road noise (2.8% per 10 dB rise, 95% confidence interval [1.2; 4.5]) and railroad noise (2.3% per 10 dB rise [0.5; 4.2]), but not airplane noise. Airplane noise levels of 60 dB and above were associated with a higher risk of myocardial infarction (OR 1.42 [0.62; 3.25]). This higher risk is statistically significant if the analysis is restricted to patients who had died of myocardial infarction by 2014/2015 (OR 2.70 [1.08; 6.74]). In this subgroup, the risk estimators for all three types of traffic noise were of comparable magnitude (3.2% to 3.9% per 10 dB rise in noise level).

CONCLUSION: In this study, a substantial proportion of the population was exposed to traffic noise levels that were associated with an albeit small increase in the risk of myocardial infarction. These findings underscore the importance of effective traffic noise prevention.

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