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Exposure-response relationship of the association between aircraft noise and the risk of hypertension

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Abstract

Noise is a stressor that affects the autonomic nervous system and the endocrine system. Under conditions of chronic noise stress the cardiovascular system may adversely be affected. Epidemiological noise studies regarding the relationship between aircraft noise and cardiovascular effects have been carried out on adults and on children focussing on mean blood pressure, hypertension and ischemic heart diseases as cardiovascular endpoints. While there is evidence that road traffic noise increases the risk of ischemic heart disease, including myocardial infarction, there is less such evidence for such an association with aircraft noise. This is partly due to the fact that large scale clinical studies are missing. There is sufficient qualitative evidence, however, that aircraft noise increases the risk of hypertension in adults. Regarding aircraft noise and children's blood pressure the results are still inconsistent. The available literature was evaluated for the WHO working group on "Aircraft Noise and Health" based on the experts' comprehensive knowledge in this field. With respect to the needs of a quantitative risk assessment for burden of disease calculations an attempt was made to derive an exposure-response relationship based on a meta-analysis. This association must be viewed as preliminary due to limitations which are concerned with the pooling of studies due to methodological differences in the assessment of exposure and outcome between studies. More studies are needed to establish better estimates of the risk.

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