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The West London Schools Study: the effects of chronic aircraft noise exposure on child health

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Abstract

Background: Previous field studies have indicated that children's cognitive performance is impaired by chronic aircraft noise exposure. However, these studies have not been of sufficient size to account adequately for the role of confounding factors. The objective of this study was to test whether cognitive impairments and stress responses (catecholamines, cortisol and perceived stress) are attributable to aircraft noise exposure after adjustment for school and individual level confounding factors and to examine whether children exposed to high levels of social disadvantage are at greater risk of noise effects.

Methods: The cognitive performance and health of 451 children aged 8-11 years, attending 10 schools in high aircraft noise areas (16 h outdoor Leq > 63 dBA) was compared with children attending 10 matched control schools exposed to lower levels of aircraft noise (16 h outdoor Leq < 57 dBA).

Results: Noise exposure was associated with impaired reading on difficult items and raised annoyance, after adjustment for age, main language spoken and household deprivation. There was no variation in the size of the noise effects in vulnerable subgroups of children. High levels of noise exposure were not associated with impairments in mean reading score, memory and attention or stress responses. Aircraft noise was weakly associated with hyperactivity and psychological morbidity.

Conclusions: Chronic noise exposure is associated with raised noise annoyance in children. The cognitive results indicate that chronic aircraft noise exposure does not always lead to generalized cognitive effects but, rather, more selective cognitive impairments on difficult cognitive tests in children.

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