

Heart Disease

W Q Gan et al. *Occup Environ Med* (2011) Vol.68 p 183-190

Exposure to occupational noise and cardiovascular disease in the United States: the National Health and Nutrition Examination Survey 1999-2004

The research provides some evidence that long term exposure to loud noise at work is associated with increased risk of some forms of heart disease.

The authors report that 17% of US workers are exposed to hazardous levels of noise at work, there is inconsistent evidence linking this to blood pressure and heart disease.

In the combined NHANES 1999 2004 dataset, there were 15, 332 participants aged 20 years and older, of whom 8,152 (53.2%) were currently employed. After deleting records where important data was missing, e.g. smoking history, there were 4,829 participants in the study. Participation rates before deleting were over 70%.

Exposure was assessed using questions such as 'have you had to raise your voice to be heard'? Based on accumulated noise exposure time, participants in the current exposed group were divided into tertiles, representing short- (0-0.3 years), medium- (0.4-1.5 years) and long-term (1.6-18.8 years) exposure to occupational noise, respectively.

Diagnostic status was also by asking questions such as 'has a doctor ever told you, you have coronary heart disease'? Blood pressure was measured by the research team. Blood lipids and other biological risk factors were analysed by the research team.

Covariates included race, educational level, income, physical recreations, smoking and passive smoking, alcohol habit.

21% of workers were exposed to loud noise at work.

Fully adjusted Odds Ratios for angina and all kinds of coronary heart disease were statistically significant in the long exposure group, but not in the short or medium exposure groups. OR = 2.91 (1.35-6.26) and 2.04 (1.16-3.58) respectively. Risks for myocardial infarction, coronary heart disease and cardiovascular disease (blood pressure and stroke) were not significant in any exposure set. Hypertension was not associated with noise exposure, but isolated diastolic hypertension was OR = 2.2 (1.2 to 4.1). Biological risk factors were not associated with exposure.

Hearing loss was used as a validity check for exposure assessment. Hearing loss was positively associated with exposure, as expected.

Comment

No account was taken of shift work, physical workload, noise exposure from road traffic, fine particulate air pollution in the workplace and residence.

This was a cross-sectional experiment; causation is unclear. Diagnostic status was by self report and there was some evidence of misclassification. In future, blood analysis could use chemical signals to determine diagnostic status for heart disease.

The number of heart disease cases was very low. It would be more informative to follow the cohort up to age 75.