
214 Acute Effects of Occupational Noise Exposure on 24-Hour Ambulatory Blood Pressure in Workers with Hypertension

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Abstract

Objectives: Hypertension is the prevalent disease in the workplace. Although the elevation of blood pressure from exposure to occupational noise has been recognized, research on susceptibility to occupational noise exposure in adults with hypertension is not reported. This repeated-measure study investigated the effects of occupational noise exposure on 24-hour ambulatory blood pressure in a cohort with hypertensive and normotensive workers.

Methods: We enrolled 117 volunteers in an aircraft-manufacturing industrial cohort followed from 1998 to 2008. Individual noise exposure and personal blood pressure were determined simultaneously over 24 hours in 19 hypertensive and 98 normotensive workers during the working and non-working days. Linear mixed-effects regressions were used to investigate the effects of noise exposure on ambulatory systolic blood pressure (SBP) and diastolic blood pressure (DBP) between two groups during different periods by controlling for potential confounders.

Results: Hypertensive workers had significantly higher mean values of ambulatory SBP (12.6 [95% confidence interval: 10.3-15.0] mmHg; 10.3 [7.8-12.8] mmHg) and DBP (8.0 [6.3-9.7] mmHg; 7.2 [5.3-9.1] mmHg) compared with normotensive workers on both working and non-working days. Such differences between two groups were obviously higher on the working day than on the non-working day. Per one A-weighted decibel (dBA) increase in the 24-hour average noise exposure was significantly associated with transient elevations of SBP (0.25 [0.15-0.36] mmHg) and DBP (0.16 [0.09-0.23] mmHg) among hypertensive workers on the working day. Such effects on SBP and DBP still persisted at the 60-min time-lagged noise exposure and the increases of SBP were more pronounced in the hypertensive group than in the normotensive group.

Conclusions: Hypertensive workers are more susceptible to noise exposure, especially the effect on ambulatory SBP. These results suggest a need for the more protection to the susceptible population.

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80 The association between heat exposure and work-related injuries in South Australia, 2001-2010

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Abstract

Objective: To investigate the association between work-related injuries and temperature, to identify the groups of workers at high risk of heat-related injuries, and to explore the possible lagged effects of extreme heat on work-related injuries. **Method:** Workers' compensation claims data obtained from SafeWork South Australia for the period of 2001-2010 were transformed into time series format and merged with daily meteorological data. The impacts of temperature on daily work-related injury rates were estimated by using generalized estimating equation model with negative binomial distribution, a log link function and a first order autocorrelation structure. A piecewise linear spline function was utilized to quantify the effect of temperature on work-related injury rates below and above thresholds. The day of the week and long-term trends were adjusted. **Result:** Overall, there was an association between work-related injuries and temperature in South Australia. One degree Celsius increase in temperature below 38°C was associated with 0.2% increase of injury rate. However, the injury risk declined significantly above this temperature.

Specifically, the following groups of workers were at high risk of heat-related injury: male workers (IRR 1.004, 95% CI 1.002-1.005); and young workers aged <=24 (IRR 1.003, 95% CI 1.000-1.006). Occupations at risk were labourers and related workers (IRR 1.004, 95% CI 1.001-1.006), intermediate production and transport workers (IRR 1.002, 95% CI 1.000-1.004), and tradespersons and related workers (IRR 1.003, 95% CI 1.001-1.006). Industries showing an association between injuries and temperature were agriculture (IRR 1.007, 95% CI 1.002-1.013), construction (IRR 1.005, 95% CI 1.002-1.008), finance, property and business services (IRR 1.006, 95% CI 1.001-1.012), and overall outdoor industries (IRR 1.004, 95% CI 1.002-1.006). A lagged effect of extreme heat on work-related injury rates has not been found.

Conclusion: The risk of work-related injuries is significantly associated with heat exposure, especially for vulnerable groups in the workplace.