CHANGES IN DEEP BODY TEMPERATURES FOLLOWING EXPOSURE TO NOISE AND CARBON MONOXIDE AT VARIOUS AMBIENT TEMPERATURES

Manninen O, Clerici W, and Fechter L
The Johns Hopkins University, Department of Environmental Health Sciences, School of Hygiene and Public Health, Division of Toxicological Sciences, Baltimore, Maryland, USA

Abstract
Deep body temperatures (dbt-values) of 72 male Long-Evans hooded rats were determined immediately before and after 4 hour exposure to 18 combinations of noise, carbon monoxide (CO) and ambient temperatures. The noise levels were no extra noise, broad band noise of 90 dBA and 105 dBA. The ambient temperature level was maintained within the chamber at 20°C, 35°C or 40°C. CO level was either 0 or 750 ppm. Dbt alteration utilized as an index of general load produced by these burdens. The results showed that the dbt-values changed least when rats were exposed solely to 20°C (x=+0.1°C). When adding either noise of 90 dBA or 105 dBA or 750 ppm CO to the 20°C ambient temperature condition the decrease of the mean dbt-values was 1.5°C to 1.8°C. However, the greatest mean decrease in the dbt-values was found when rats were simultaneously exposed to 750 ppm CO and noise of 90 dBA (x=2.8°C) and 750 ppm CO and noise of 105 dBA (x=2.6°C). At 35°C (no similar changes were found. At 40°C the tendency had reversed such that under both noise exposures rats gained heat (x=0.6°C to 0.8°C) and especially under the combination of 105 dBA and 750 ppm CO the mean dbt-values increased by 1.6°C.

[Research supported by the Academy of Finland and the Finnish Work Environmental Fund.]

Paper presented at the Fourth International Conference on The Combined Effects of Environmental Factors ICCEF’90 at the Peabody Court Hotel, September 30 - October 3, 1990, Baltimore, Maryland, USA (Book of Abstracts, page 24).