The Effect of Heat Exposure on Cortisol and Catecholamine Excretion Rates in Workers in Glass Manufacturing Unit

Vangelova K., Deyanov Ch., Velkova D., Ivanova M., Stanchev V.

National Center of Hygiene, Medical Ecology and Nutrition, Sofia, Bulgaria

Summary

The aim of the investigation was to study the effect of long term repeated heat exposure on the excretion rates of stress hormones of workers in glass manufacturing unit. Sixteen operators, exposed to heat, were studied during the hot period and compared to a control group of 16 subjects, working in the same manufacturing unit. Both groups had moderate workload. The microclimate components and the Wet Bulb Globe Temperature were used for defining the heat exposure. The excretion rates of cortisol, adrenaline and noradrenaline were followed during the early morning shifts on three hour intervals using RIA and fluorophotometric methods. Heart rate was followed, too. The psychosocial factors were measured by the “My job” questionnaire. Highly significantly higher cortisol, noradrenaline and adrenaline values were measured in the heat exposed operators compared to the control group, while significant differences of the psychosocial factors between the two groups lacked. Even if the heart rate was in the safe limits, the found alterations in the stress system are considerable and indicate heat stress. The work in conditions of overheat is associated with considerable heat stress and the possible health implications need to be clarified.

Key words: heat stress, occupational exposure, stress hormones, psychosocial factors

Address for correspondence: K. Vangelova, National Center of Hygiene, Medical Ecology and Nutrition, 15 Dimiter Nestorov Boul., 1431 Sofia, Bulgaria, E-mail: KatiaVangelova@yahoo.com