

The Effect of Lead Exposure on Postural Control in Workers

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Objectives

To examine the effect of lead on postural control of workers who have been exposed to lead.

Methods

We compared 63 male, lead battery workers aged 41.0 ± 7.4 to 48 age matched male controls after excluding those with acute or chronic diseases. Exposed workers had mean past blood levels of 37.5 ± 9.2 $\mu\text{g}/\text{dl}$ and 11.2 ± 5.7 years of employment. Postural control was measured with a computerized postural sway measurement system which measured both sway and total movements.

Results

Workers standing straight with eyes open on the bare plates had sway and total movements which were not notably different from controls. On the other hand increased movements were needed in the exposed workers to maintain stability (the general stability quotient 18.2 ± 5.4 compared to 15.4 ± 4.4 in controls, $p < 0.01$) when standing directly on the footplates with closed eyes, and with head tilted (15.0 ± 3.8 compared to 11.5 ± 3.0 in controls, $p < 0.001$). Exposed workers also had a trend for less ability to synchronize anterior-posterior and lateral sway in the stress positions (0.0625) in comparison to non-exposed workers. Significant but low correlations were found between the estimate of chronic lead internal dose and 3 of 10 postural control measurements, and in only one of the 10 measurements and present lead blood levels (r values ranged from 0.21 to 0.31, $p < 0.03$).

Conclusions

These findings suggest that lead affects postural control in asymptomatic workers. Further studies are warranted to determine whether workers with decreased postural control are at increased risk of accidents and the relationship, if any, of these measurements with subsequent morbidity.