Artículo

Título
Relations of brain volumes with cognitive function in males 45 years and older with past lead exposure.
(Relación del volumen cerebral con la función cognitiva en varones mayores de 45 años con una exposición al plomo en el pasado)

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Abstract
We examined relations between brain volumes assessed by MRI and cognitive function in subjects in whom we have previously reported associations of cumulative lead dose with: (1) longitudinal declines in cognitive function; (2) smaller volumes of several regions of interest (ROIs) in the brain; and (3) increased prevalence and severity of white matter lesions. We used two complementary methods (ROI- [evaluating 20 ROIs] and voxel-wise) to examine associations between brain volumes and cognitive function using multiple linear regression. MRIs and cognitive testing were obtained from 532 former organolead workers with a mean (SD) age of 56.1 (7.7) years and a mean of 18.0 (11.0) years since the last occupational exposure to lead at the time of MRI acquisition. Cognitive testing was grouped into six domains of function (visuo-construction, verbal memory and learning, visual memory, executive functioning, eye-hand coordination, processing speed). Results indicated that larger ROI volumes were associated with better cognitive function in five of six cognitive domains, with significant associations observed for visuo-construction (15 of 20, p<or=0.05), processing speed (12, p<or=0.05), visual memory (11, p<or=0.05), executive functioning (11, p<or=0.05), and eye-hand coordination (11, p<or=0.05). Significant structure-function relations were also identified in the voxel-wise analysis with low false discovery rates (all less than 2.2%). Thus, larger volumes were associated with better cognitive function using both ROI- and voxel-based methods. In this cohort, an interesting group in which to examine structure-function relations, this finding provides a necessary condition to support the hypothesis that lead may influence cognitive function by its effect on brain volumes.

Enlace