

Reading ability protects brain from lead exposure

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Lead smelter workers who are better readers have more protection against the effect of lead exposure on the brain than those who do not read as well, according to a study on the impact of cognitive reserve published in the July 31, 2007, issue of *Neurology*, the medical journal of the American Academy of Neurology.

It has long been known that occupational lead exposure has negative effects on nerves and a number of areas of brain functioning. Certain well-ingrained brain functions, however, seem resistant to the effects of lead exposure. One of these is reading ability, which is also an indicator of cognitive reserve, or the brain's ability to maintain function in spite of damage. Genetics, education and childhood cognitive abilities are factors which may contribute to cognitive reserve.

The study involved 112 smelter workers in New Brunswick, Canada. The workers underwent several cognitive and motor speed tests and a measure of reading ability. The researchers calculated working lifetime lead exposure from historic blood lead levels obtained by the smelter. The workers were then divided into groups with high cognitive reserve, defined as a reading level of 12th grade or higher, and low cognitive reserve, a reading level of 11th grade or lower.

“Even though the two groups had similar lead exposure, the cognitive effects of lead were 2.5 times greater in workers with low reading ability. In contrast, the effect of lead on motor speed was comparable in both groups as cognitive reserve does not apply to motor speed,” said

study author Margit L. Bleecker, MD, PhD, with the Center for Occupational and Environmental Neurology in Baltimore, MD, and member of the American Academy of Neurology. “This suggests that high cognitive reserve has a protective effect that allowed these workers to maintain their functioning, even though lead affected their nervous system as shown by its effect on their motor skills.”

Bleecker says there are multiple theories on how cognitive reserve protects against insults to the brain. “These include an increased concentration of cortical synapses in larger brains that provide more brain capacity, a greater ease of using alternative brain circuits, and the ability to process tasks more efficiently in current brain circuits,” said Bleecker.

Source: American Academy of Neurology

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