New health issues tied to low-level lead exposure

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Despite dramatic progress in reducing Americans' exposure to lead over the past 25 years, a growing body of research finds that children and adults still face health risks from even very low levels of the toxic metal in their blood.

A recent government study, prepared with help of researchers from Johns Hopkins' Bloomberg School of Public Health, tallies the wide-ranging damage low-level lead exposure can do, beyond the well-documented effects of reducing youngsters' IQ and undermining their ability to learn and control their behavior. Hearing and even the onset of puberty may be affected in children, while in adults, kidneys and blood pressure may be harmed.

"There does not appear to be a really safe level of lead exposure," said Andrew A. Rooney, a senior health scientist with the National Toxicology Program who coordinated the review of existing research. "The best course of action," he added, "is to eliminate all lead exposure from our environment."

Mounting evidence that children can experience learning and behavior problems from low-level lead exposure prompted the U.S. Centers for Disease Control and Prevention last month to cut in half the level of lead in young children's blood at which health authorities are urged to intervene. For more than 20 years, the "level of concern" in young children had been 10 micrograms of lead per deciliter of blood. Declaring there is no safety threshold for the metal, the CDC set a new

"reference level" of 5 micrograms per deciliter.

In Maryland, that change is expected to multiply the number of youngsters deemed in need of help, even after the state experienced a 98 percent reduction in childhood lead poisoning cases.

But the federal study found scientific evidence of other harmful health effects, besides those related to learning and behavior, at those low levels.

Children were found to be at greater risk of delayed puberty, reduced growth and hearing deficit when the lead levels in their bloodstream were at or below 10 micrograms per deciliter. The study also found adults had increased blood pressure and greater risk of hypertension at similar lead levels.

But at even lower levels - 5 micrograms per deciliter or less - the study found evidence of reduced kidney function in adults, as well as reduced fetal growth and lower birth weights in pregnant women.

Rooney said the National Toxicology Program launched its review at the request of the National Institute of Occupational Safety and Health, which was concerned about lead's reproductive effects on pregnant workers. The current workplace exposure limit for lead is 50 micrograms per cubic meter in the air.

But the federal research team and a group of independent scientists serving as technical advisors chose to broaden the study to look at all documental health effects from low levels of lead.

In some areas, the report concluded that there was only limited research to date linking low-level lead exposure with cardiovascular disease. While researchers agreed increased blood pressure and hypertension may

result, they were split on whether lead could be tied to increased heart attack deaths.

"The evidence, I would say, is growing," said Dr. Ana Navas-Acien, associate professor at Hopkins' School of Public Health and one of the technical advisors for the federal study.

In addition to the risks of heart attack death, she said, there's some research linking low-level lead exposure to peripheral arterial disease, in which it becomes painful to walk or stand.

But Navas-Acien said she believes lead's role in cardiovascular disease merits more study.

While low-level lead exposure may harm people at all ages, Rooney and Navas-Acien said that for the most part, there's little to be done for adults. Chelation therapy, in which chemical compounds are injected to remove metals from the body, only work when lead is at much higher levels.

Rather, the finding of widespread health effects at low levels should provide further impetus for eliminating lead exposure, they said. The health effects on any individual from tiny doses of lead may seem minor compared with the risk of retardation and even death at very high levels, Navas-Acien said, but widespread low-level exposure could effectively lower the intelligence and hurt the health of a broad segment of the population.

While there are few clear remedies for low-level exposure, Navas-Acien said her research suggests there is one underappreciated source of lead that could be reduced - secondhand smoke. Lead is taken up by tobacco leaves and then inhaled with the smoke from cigarettes.

In cases where children test positive for low levels of lead in their blood, she said, "it will be really important to assess if there are smokers in the house of that child. ... If they could quit, that would be ideal. But even if they can't quit, don't do it in the house or don't smoke when the child is around."

LEAD'S SUBTLE HEALTH IMPACTS

The National Toxicology Program reviewed epidemiological studies of health effects from exposure to lead at levels in the bloodstream of 10 micrograms per deciliter. Among their findings for children and adults:

Children

-Increased attention-related behavioral problems, lower performance in school and lower IQ

-Delayed puberty and reduced growth after birth

Adults

-Decreased kidney function

-Increased blood pressure and hypertension

-Also, "limited" evidence of increased deaths from heart attacks.