Low level cadmium exposure linked to lung disease

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(PhysOrg.com) -- New research suggests that cadmium is one of the critical ingredients causing emphysema, and even low-level exposure attained through second-hand smoke and other means may also increase the chance of developing lung disease.

The University of Michigan School of Public Health study suggests that higher cadmium levels in the body as much as double the risk of developing a pulmonary disease diagnosis such as emphysema or chronic bronchitis.

Though some studies have linked high levels of cadmium with decreased lung function in occupationally exposed workers, this is only the second known study to show that subjects with even slightly increased levels of cadmium had decreased lung function and the first known study to do so using repeated measures of lung function over time.

"The study suggests that the critical ingredient in smoking that may be causing emphysema is cadmium, a well-known contaminant of cigarette smoke," said Howard Hu, professor at the U-M School of Public Health and principal investigator in the study. "The worry is if you are exposed to this (cadmium) through other sources you can also be at risk for emphysema."

Non-smokers are exposed to cadmium when they eat contaminated foods or inhale second-hand smoke, as well as through a host of occupational exposures. Cadmium is a metal that is difficult for the body

to dispel, Hu said, because kidneys tend to retain cadmium, and it recycles into the body.

Cadmium has received its share of media attention, and some consumer groups are concerned about cadmium in sludge and crop fertilizers. It is also widely used in batteries and pigments.

"The big picture is, we keep learning more about the contributions of environmental toxins to the chronic diseases of aging for which we never suspected an environmental cause," said Hu, who is also chair of the School of Public Health Department of Environmental Health Sciences and has an appointment with the Medical School.

The study looked at 96 men randomly selected from within the Normative Aging Study, a project that began in 1961 and includes approximately 2,280 healthy, male volunteers from Boston, Mass.

Researchers tested lung function using three different measures. Subjects with higher levels of urinary cadmium showed evidence of a reduced ability to exhale, irrespective of whether they smoked but with an effect that was greatest and clearest among current and former smokers.

The next step is a much larger, population-based study with more subjects and multiple measurements of cadmium exposure and lung function over time, Hu said.

"With a larger population we will be able to better disentangle the independent effects of cadmium and smoking, and whether dietary cadmium or other non-cigarette sources may also influence lung function," Hu said.

Sung Kyun Park, research assistant professor in the U-M School of

Public Health, was second author and supervised the analysis of data. The paper, "Association Between 24-hour Urinary Cadmium and Pulmonary Function Among Community-Exposed Men: The VA Normative Aging Study" is available at: www.ehponline.org/docs/2008/11265/abstract.html .
It is scheduled for the September issue of the journal Environmental Health Perspectives.

Source: University of Michigan