Research Brief 206: Arsenic Linked to Developmental Changes in the Heart

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Exposure to low levels of arsenic in drinking water is linked to increases in blood pressure and increased risk of heart disease among adults. Now a study from the University of Arizona NIEHS Superfund Research Program links arsenic exposure during early development to heart problems.

Todd Camenisch, Ph.D., analyzes a western blot of proteins from heart cells disrupted by arsenic.

(Photo courtesy of University of Arizona)

Todd Camenisch, Ph.D., associate professor of pharmacology and toxicology, uses a mouse model to reveal the effects of low-level arsenic exposure during postnatal development on the cardiovascular system. In his new study, mice were exposed to low levels of arsenic (100 parts per billion) in drinking water for 22 weeks after weaning. The exposed mice showed significant increases in blood pressure compared to control mice, and they also showed a thickening of the left heart wall.

"These observations strongly suggest that chronic exposure to arsenic promotes hypertension and subsequent changes in size, shape, and function of the heart," Camenisch said. "To our knowledge, this is the first animal study to assess cardiovascular changes in response to chronic exposure to environmentally relevant concentrations of arsenic."

Further studies are needed to reveal details of the mechanism behind the link between arsenic and cardiotoxicity, to find out if the same phenomenon occurs in humans, and to determine what, if any, interventions can prevent arsenic-induced heart disease.

To learn more about this research…

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