

Placenta reflects arsenic exposure in pregnant women and fetuses, study shows

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The placenta can be used to reliably measure arsenic exposure in pregnant women and how much of the toxic metal is transferred to their fetuses, a Dartmouth College study shows.

The study, the largest ever analysis of household drinking water [arsenic](#) and the mother-to-fetus connection, appears in the *Journal of Exposure Science and Environmental Epidemiology*.

Recent studies have used the placenta to identify early effects of exposure to lead, mercury, cadmium and other metals. Previous studies also have shown that arsenic readily crosses the placenta and may adversely affect fetal development. But little is known about arsenic concentrations in the placenta and their relation to maternal and infant exposure, particularly at low levels.

The Dartmouth researchers measured total arsenic concentrations in placental samples from 652 women. They compared these data to urinary arsenic collected from the women during pregnancy, along with post-partum arsenic in toenail clippings from the women and their infants. The researchers also examined associations between placental arsenic and the women's [arsenic exposure](#) from private well water and rice consumption. Lastly, they computed the ratio of maternal-to-infant toenail concentrations of arsenic, which is an indicator of maternal-infant arsenic transfer.

The results showed that placenta arsenic concentrations were positively

associated with [arsenic levels](#) in maternal urine, maternal and infant toenails and household drinking water. Lower ratios of maternal-to-infant toenail arsenic concentrations, which indicate greater placental transfer, were observed at high placental arsenic concentrations.

"Our findings show placental arsenic concentrations reflect both maternal and fetal biomarker concentrations," says lead author Tracy Punshon, a research assistant professor of biological sciences. "They support placenta as a potentially useful biomarker of arsenic exposure, particularly in studies of placental function. They suggest greater maternal-fetal transfer when placental arsenic is high."

More information: *Journal of Exposure Science and Environmental Epidemiology*, [www.nature.com/jes/journal/vao ... full/jes201516a.html](http://www.nature.com/jes/journal/vao...full/jes201516a.html)

Provided by Dartmouth College

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