Silicone Wristbands Can Detect Pregnant Women's Exposure to Harmful Chemicals

Silicone bracelets are an effective tool to gauge the amount of polycyclic aromatic hydrocarbons pregnant women inhale daily.

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Silicone wristbands may be best known as vehicles for raising awareness of various causes. But study findings published in the Journal of Exposure Science & Environmental Epidemiology show that these colorful bracelets may be able to measure women's exposure to harmful chemicals called polycyclic aromatic hydrocarbons (PAHs) during pregnancy, reports a press release from Texas A&M.

Known to trigger negative health effects in developing fetuses, polycyclic aromatic hydrocarbons (PAHs) are produced when coal, oil, gas, wood, garbage and tobacco are burned.

For the study, a research team from Texas A&M University and the Johns Hopkins Bloomberg School of Public Health enlisted the participation of a small group of women ages 21 to 35 in their third trimester of pregnancy. All the women lived in nonsmoking households in Hidalgo County, Texas, an area characterized by a high prevalence of childhood asthma and a high rate of premature births. None of the women had asthma or diabetes.

The participants were outfitted with backpacks loaded with air sampling instruments; a silicone wristband was attached to the strap of each backpack. (Silicone wristbands were used for their ability to bind PAHs.) Next, researchers collected measurements of PAHs over three nonconsecutive 24-hour periods from the separate pieces of equipment.

Results showed that the wristbands and the air sampling devices all registered similar readings.

"The use of wristbands is appealing because [they are] inexpensive and easy to wear," said Itza Mendoza-Sanchez, PhD, an assistant professor in Texas A&M's department of environmental and occupational health and the coauthor of the study. "Wristbands have been used to detect a number of pollutants, but qualification of those pollutants remains a challenge. Our goal was to evaluate to what extent we can use wristbands as passive samplers to quantify PAHs in air."

Natalie M. Johnson, PhD, an associate professor in the same department who led a larger study on maternal environmental health, suggested that the wristbands might be useful in upcoming inquiries assessing poor health outcomes in children whose mothers might have been exposed to PAHs.

“Maternal exposure to PAHs during pregnancy is particularly harmful to children’s health since this is a phase of rapid human growth and development,” said Johnson. “Thus, easy methods to quantify PAH exposure are of critical need in order to evaluate risk and develop effective intervention strategies.”

To learn more about toxic substances that can negatively affect children’s health, read “More Than 100 Possibly Toxic Chemicals Found in Plastic Toys for Kids.”

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