

Podcast Script: Windows of Susceptibility with Ami Zota

Narrator: People can be exposed to many different types of chemical and non-chemical stressors in their everyday lives. There are also certain times in our lives where our health may be more vulnerable to such exposures. These periods of time, referred to as “windows of susceptibility,” are the focus of a growing body of research.

Dr. Ami Zota is an assistant professor of environmental and occupational epidemiology at George Washington University who is very interested in windows of susceptibility and impacts on children’s health.

She explains that everyday exposures to chemical and nonchemical stressors are complex and come from a variety of sources.

Zota: Virtually everyone is exposed to low level chemicals everywhere and every day. A lot of these chemicals are used in common consumer products, including our cleaning products, and our personal care and beauty products. We can also be exposed through the food we eat, through our indoor environment, as well as through air pollution and the work environment.

Narrator: At low levels, exposure to these chemicals may not necessarily impact the health of an average adult. However, scientists are beginning to study certain periods of development that may be particularly sensitive to changes caused by these exposures, and how the timing of exposure can greatly influence health outcomes.

Zota’s research focuses on pregnancy as one such window of susceptibility.

Zota: Fetal development is a very vulnerable period because all of the organs are undergoing rapid formation and development. During early development, depending on when the exposure occurs, it can really have long lasting effects on different target organs, whether it’s the reproductive tract or the brain or the lungs.

So even low levels of exposures to stressors, such as environmental chemicals, can have profound implications on the trajectory of fetal development, which can manifest as poor birth outcomes or delays in neurodevelopment, but it can also manifest later in life.

Narrator: Common daily exposures to pollutants and other stressors rarely occur in isolation, which presents a challenge for researchers and public health practitioners. For example, using a nationally representative sample, Zota and her colleagues with the Program for Reproductive Health and the Environment at the University of California, San Francisco, found that virtually every pregnant woman in the United States has an average of 43 chemicals from the external environment that can be detected in her body.

Furthermore, these stressors can interact with each other to impact human health. In fact, Zota’s research over the last few years seeks to understand how exposure to potentially harmful chemicals in the environment may interact with social disadvantage or stress to increase the potential for harm during pregnancy and early childhood development.

Zota: This includes environmental chemical exposures, as well as diet, or stress the mother is experiencing. One active area of research is trying to understand how these stressors and hazards from many different sources may biologically interact to shape health and wellness.

Narrator: Fortunately, the work scientists are doing to understand the role of various exposures during early development is providing unique insight into opportunities for interventions to protect children's health during important windows of susceptibility. For example, Zota pointed to intervention studies that aim to reduce the amount of processed foods that people consume or encourage participants to carefully read the list of ingredients on personal care products during pregnancy.

She also noted that basic health practices like hand washing can help reduce exposure to many potentially harmful chemicals.

Zota: So, even just being more conscious of the products you're using, by reading labels, by using freely available guides and apps that help you understand and navigate this information are two ways that individuals can take some control over their exposures.

Narrator: While individual behavior changes can help to reduce exposure to potentially harmful chemicals or to other stressors during critical windows of susceptibility, Zota suggests that scientific research could also be used to inform decision making at the local, federal, and global level to protect health.

Zota: Given the robust evidence that is developing on prenatal exposures and their implications for reproduction and development, we really need cooperation and creativity from a variety of stakeholders including academia, government, and the private sector to reduce chemical exposures and ultimately improve human health.

I'm committed to developing innovative approaches for science translation so that my research can more effectively be used to inform decision making at the individual and collective level.

Narrator: By working together and making scientific research more accessible to both the public and decision makers, Zota and other scientists are helping to shed light on the complexity of everyday exposures and stressors, to define critical windows of development where our health may be more susceptible to harm, and to identify actionable intervention strategies that may improve human health now and in the future.

Thanks to today's guest, Dr. Ami Zota, for joining us.

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