AHS EXAMINES POTENTIAL LINK BETWEEN PESTICIDE USE AND RARE CANCER

In the U.S., approximately 11,000 men are diagnosed each year with multiple myeloma. Although multiple myeloma is rare compared to more common cancers, such as prostate cancer (which affects approximately 240,000 men each year), it occurs more frequently among farmers than non-farmers.

Little is known about the causes of multiple myeloma, but some studies have found an early marker related to a higher risk of the disease. A small number of people with monoclonal gammapathy of undetermined significance (MGUS) go on to develop multiple myeloma. MGUS is a benign condition in which abnormal blood cells make M proteins. Usually, MGUS has no symptoms. It is found with a blood test.

STUDY LINKS TWO PESTICIDES TO PARKINSON’S DISEASE

Parkinson's disease is a common neurological disorder affecting movement; about one million people in the U.S. have been diagnosed with the disease. In a study led by Dr. Freya Kamel from the National Institute of Environmental Health Sciences and Dr. Caroline Tanner from the Parkinson's Institute, AHS researchers found a link between the use of two pesticides and risk for Parkinson's disease. Although the number of AHS participants with Parkinson's disease is small, participants who used either paraquat or parathion developed the disease about 2.5 times more often than those who never used either pesticide.

These results extend earlier evidence from laboratory studies. In animal studies, both pesticides can cause movement problems similar to those in humans with Parkinson's disease. In studies of cells, these pesticides can cause damage similar to that found in brain cells of humans with Parkinson's disease. A recent small study in the AHS found farmers over the age of 50 were more likely to have MGUS than men of the same age in the general population. A link between MGUS and some pesticides was also found, but the study was too small to draw firm conclusions. “If we identify specific exposures related with excess MGUS, it may help us understand the causes of multiple myeloma, and design studies to delay and prevent its progression,” said Dr. Ola Landgren from the National Cancer Institute.


Q&A: WHAT ARE YOU DOING WITH MY CHEEK CELLS?

Q: I returned a vial of mouth rinse. Can you tell me how it was used?

A: Approximately 35,000 AHS participants provided a vial of mouth rinse containing cheek cells. The biological samples contain DNA that can be used to measure small variations in genes. We are using these samples to tell us how variations in genes affect disease risk.

We know that factors like smoking, exercise, diet, or exposure to certain chemicals can influence risk of disease. However, the development of chronic diseases, such as cancer, is usually due to multiple factors, including variations in genes. For example, not all smokers develop lung cancer. Therefore, we are combining gene information from cheek cells with exposure information from questionnaires to get a more complete picture of what increases a person's chance of developing a specific disease.

In one such study, we use DNA from cheek cells to study the risk of prostate cancer in men who use certain chemicals. We found that men with a certain genetic trait who used some pesticides, including fonofos (an organophosphate insecticide no longer sold in the United States), had a greater chance of getting prostate cancer than men who used the same pesticide, but did not have the genetic trait. These findings need to be confirmed in other study populations. It is too soon to make any health care recommendations based on these results. We still have much to learn about the complex relationship among genes, our environment, and our health.
UPDATION SPECIAL STUDIES

The AHS invites some participants to be part of smaller research studies to learn about specific diseases or exposures. Currently, we are working on three such studies (see below). We also continue to contact participants who report specific health conditions, such as rheumatoid arthritis and certain cancers, to obtain additional information on their diagnoses and to collect cheek cell samples for future studies.

BIOMARKERS OF EXPOSURE AND EFFECTS IN AGRICULTURE (BEEA) STUDY

AHS investigators have launched the BEEA Study led by Drs. Michael Alavanja and Laura Beane Freeman from the National Cancer Institute. Over the next three years, we will collect blood and urine samples and questionnaire information from 1,600 men. We are also collecting house dust samples from some participants. The samples and data will be used for a variety of future studies. “In past studies we have been able to identity links between certain pesticide exposures and disease risk by combining information from questionnaires with DNA from cheek cell samples. Blood and urine samples from the new study will allow us to expand our understanding of how pesticides influence disease risk,” says Dr. Alavanja.

METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS (MRSA) STUDY

MRSA (pronounced MER-sa) is a type of bacteria responsible for several difficult-to-treat infections in humans. Most MRSA infections occur in people who have been in hospitals, but MRSA infections are also found in people who work with some kinds of livestock. The MRSA Study, led by Dr. Tara Smith at the University of Iowa, is investigating factors that might increase a person’s chance of developing such an infection. Currently, 1,100 AHS participants in Iowa have provided nose and throat swabs, as well as information about their exposure to livestock and healthcare settings. The participants will also complete surveys about possible infections that might develop within 18 months after enrolling in the study. Participants who develop a possible infection will be asked to send in a swab sample. The study will help answer questions about MRSA among people who work with livestock.

LUNG HEALTH STUDY

The Lung Health Study, led by Drs. Jane Hoppin and Stephanie London from the National Cancer Institute. Dr. Jane Hoppin demonstrates lung testing. Over the next three years, we will collect blood and urine samples and questionnaire information from 1,600 men. We are also collecting house dust samples from some participants. The samples and data will be used for a variety of future studies. “In past studies we have been able to identity links between certain pesticide exposures and disease risk by combining information from questionnaires with DNA from cheek cell samples. Blood and urine samples from the new study will allow us to expand our understanding of how pesticides influence disease risk,” says Dr. Alavanja.

AHS PARTICIPANTS ARE HEALTHIER OVERALL THAN THE GENERAL POPULATION

- Study participants are less likely than the general population to die from heart disease, cancer, diabetes, lung diseases, and liver diseases.

- Rates of smoking-related cancers, such as oral, esophageal, pancreatic, lung, and bladder, are lower or similar to rates in the general population.

On the other hand, while overall injury deaths were lower, deaths related to machinery continue to be higher among AHS farmers compared to non-farmers.

A few cancers are more common among AHS farmers, including prostate cancer. We are carrying out additional studies to learn more about the risk of developing these cancers.

FAST FACT

Did you know even your eyes can become sunburned? Learn more in the Sun Exposure Fact Sheet enclosed with this newsletter.