



**MS Learn Online
Feature Presentation
Clues of Epidemiology: Part 2**

Tom

Hi, I'm Tom Kimball

Tracey

And I'm Tracey Kimball - welcome to MS Learn Online where we'll now watch the second part of "The Clues of Epidemiology."

Tom

That's right, we'll find out more about what researchers are learning from different population groups and how the environment and genetics interact to increase the risk of developing MS.

The Center of Disease Control is the most commonly associated with infectious diseases. Our next distinguished guest, Dr. Dehlia Williamson is her here talk to us about how the CDC is currently contributing to the study of multiple sclerosis.

Welcome Dr. Williamson.

Thanks, it's good to be here.

Dr. Alter was just describing the problems the investigation of clusters present. Can you speak to the in regards to the perspective of the CDC?

The CDC does not investigate clusters of MS because of the small sample size. We don't know what the risk factors are, we don't know what to look for. We don't have any baseline estimates of how many people have MS, so it's even difficult to say if there is a cluster. However, we are working on a

number of different studies to estimate the prevalence of the disease in different geographic areas and also to conduct epidemiologic studies such as the case control study to look at risk factors. In order to determine what causes MS, we need to do these large-scale studies, and we need to have hundreds of people participating so that we can figure out what's going on with this disease, what's causing this disease, whether it's an environmental factor or a genetic factor, and we need a large number of people to do that so we can look at the information that they provide and compare it to people who don't have the disease. So that's why we don't investigate smaller clusters of disease that people report, but yet, we're trying to do very refined epidemiologic studies to be able to address these concerns.

Please tell us a little more about the cases contrail study you mentioned.

We are conducting a case control study in Texas, Ohio, and Missouri. We had previously done a prevalence study and, in the prevalence study we identified everyone with definite MS, by both the Poser and McDonald criteria. We've invited those people to participate in this case control study. We are conducting a questionnaire where we're asking them about where they've lived, where they've gone to school, where they've worked, different occupations that they've had, and family members who may have MS or another autoimmune disease. For women we're asking about how many children they've had; if they've had any problems with pregnancy. We've asked about smoking history. There's a variety of other things that we're asking people that happened throughout their lifetime. We're also asking people to provide a blood sample where we're doing genetic testing.

We're looking at several different genes that we think are associated with MS. We're working with the Duke University up in Durham, North Carolina. They conduct the family MS studies, and right now, they are doing whole genome scans on these individuals. We're going to wait until their results come in to see what genes they see that may be associated with MS, before we do our genetic testing. The controls for our study are going to be other individuals who attended a neurology practice and they are going to be collecting the same type of information. We're going to be collecting information through the questionnaire, and through the blood sample, testing through the same genes. Then, we're going to compare the results to see what the differences are between people who have MS, and people who don't with both environmental exposures and with genetic susceptibility.

That sounds very interesting. Tell me doctor, do you think the rates of MS have been increasing or is that a function of new methods of ascertainment?

Because we don't have background information on the number of people with MS, you can't really monitor if those numbers are going up and especially when you're using a new diagnostic criteria. For example, I think the McDonald criteria came out in 2000 or 2001. That's going to change how people are being diagnosed with MS. So if you have a change in the criteria for classifying the disease, you may have more people being diagnosed. So it's really because of that criteria and not that more people have the disease. So it's the same thing with breast cancer or something else, where you can screen for it. If all of a sudden you have a screening mechanism, you're going to have a lot more people who may have this disease. It's not because there are more people who actually have the disease, but the screening mechanism allows you to identify those individuals that you would have missed.

MS is not currently a reportable disease. Can you explain why?

To have a disease made reportable is very difficult. Infectious diseases are reportable because there's something that you can do about them right away. When we have sexually transmitted diseases, food-borne illnesses, there's something that we can do, and they can affect a lot of different people. Cancers are reportable; they are not an acute disease. I mean, they can be a chronic disease, but there's also a lab test that identifies whether somebody has that condition or not, for all of the diseases that I mentioned, for something like MS, there is not one lab test that will say, yes, this person has MS. There needs to be a lot of different criteria that's met, and even that criteria is changing. So one, you have to have a case definition to have a disease that is reportable. I'm not even too sure that we've got that for MS, right now.

A common question of people with MS is "how did I get this disease?" Can epidemiology answer that question?

That is the role of epidemiology to try to answer those questions. I think it becomes very difficult, in some of our studies, like looking at twins. You know, why does one twin develop the disease and one twin does not. They have the same genetic makeup. They have the same exposures — environmental exposures. If they've lived in the same household their entire life, why is one of them getting this disease, and one of them is not. So the

goal of epidemiology is to figure out what causes different diseases. Unfortunately with something like MS, it's such a complex disease that it's really hard to address those issues. So researchers are working now to look at the combination of environmental exposures and genetic susceptibility to try to figure out what these triggers are, and why some people get this disease and some people don't.

Fascinating. Thank you Dr. Williamson. You really explained a number of things for us.

Thank you for inviting me.

It's time for another fact or fiction query. Let's see you how you do this time. Women are more likely to be diagnosed with MS than men. Fact or fiction? Fact. Two to three times as many women have MS than men.

Our next guest, Dr. Alberto Ascherio is a well respected epidemiologist from the prestigious Harvard School for Public Health. Thank you for being with us today, Dr. Ascherio.

Thank you. It's a pleasure to be here.

We have been learning a great deal about epidemiology and MS on today's program. How do you explain the science?

Epidemiology looks at the big picture. .if I can give you an analogy...It's like trying to find a creature hidden at the bottom of the ocean. Epidemiology can tell you where to look. Then you have to go down with the scuba divers and submarines trying to dig the treasure out.

You have been conducting some very interesting research about EBV and a possible link to MS. Can you tell us about your findings?

Well from the epidemiology I can tell you what the strong clues were that we learned from epidemiology. We do have evidence that the infectious age could be important in pre-disposing to MS. The strongest evidence points to the Epstein-Barr virus or EBV. The suspicion that EBV was related to MS was raised many years ago because the epidemiology of mononucleosis which is the acute manifestation of EBV infection is tied into this thing of epidemiology of MS. So both diseases have this latitude gradient, both

diseases of young adult. They both have the socio-economic gradient more prominent among people who have higher education. They're more common in white people than Asian or African-Americans. And they are rare among Eskimos and Japanese and so when you look at the parallels between mononucleosis and MS is to think that there is some common explanation or some, some share factor that at least for the two diseases. Now mononucleosis occurs in people who are infected with EBV late in life. If they're infected with EBV in early childhood as many are, literally all the children in the tropics are infected in the first few years of life, then mononucleosis does not occur. If you're infected during adolescence, then your risk of MS is higher and this has been shown consistently and there's no question that this relation is true. The other observation, the people who escape EBV infections, almost all adults in the United States are infected around the world are infected with EBV. Only about 5% escape infection, but a high percent of those escaping EBV infection, they're protected from MS. So their risk of MS is extremely low. So when we put the pieces together, I think there's compelling evidence that EBV is somehow at the core of, of you know MS.

What would the ideal epidemiological study look like?

Well, the ideal study would be to follow over time, half of thousand of people recruited in early childhood and follow them for 30 years or more and see who gets MS and who does not and collecting information from these people on their lifestyle and diet and blood samples so we can see when they're infected and which microorganism, their DNA to look at their genes to see how the gene interacts with the environment. That would be extremely costly. People have been talking about studies like this nationwide. Not only for MS but because this study would be useful for so many other diseases. It would be a larger question of cost and societal commitment to do this.

Thank you Dr. Ascherio for taking the time speak with us today.

Great. It was my pleasure. Thank you.

Here's our last query: Diet can cure MS – fact or fiction. No, dietary claim has yet held up in scientific studies. However, for general good health, people with MS are strongly advised to follow the lowfat, high-fiber varied diet recommended by the American Cancer Society.

Today we've learned how epidemiology has been successful in determining causes of other diseases throughout history.

From our guests, all leaders in the field, we've heard about what we do know about MS due to various epidemiological studies.

We've learned about new studies currently being conducted in the hopes of unlocking more mysteries in the search for a cause and a cure for MS.

Thank you for joining us today on "The Clues of Epidemiology". I hope we've answered some of your questions about the epidemiology of MS.

Tracey

Epidemiological studies ultimately seek to discover the cause of MS, and may also serve as the basis for developing future treatments.

Tom

To learn more about epidemiology go to NationalMSSociety.org.
And please join us again for MS Learn Online.