



STRONG HEART STUDY

newsletter

INVESTIGATING CARDIOVASCULAR DISEASE IN AMERICAN INDIANS

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Strong Heart Study Staff Completes Phase IV Early

The Strong Heart Study has built a track record that is nothing short of extraordinary. That track record has continued with Phase IV of the Strong Heart Study. The Phase IV goal for each center was to examine 1,200 participants from approximately 40 families. As of the end of August, all three centers completed the project one month ahead of schedule with the number of examinations completed by each center as follows: Arizona - 1202; Dakotas - 1206 and Oklahoma - 1210. The staff of each center is to be congratulated not only for meeting the recruitment goals of the study but also for maintaining high quality data collection throughout the examination phase. Dr. Richard Devereux, Cornell

Medical School, noted that the ultrasound imaging meets or exceeds the quality of many of the research studies conducted in urban areas by major research institutions.

Dr. Barbara Howard, Steering Committee Chair, echoed remarks from earlier phases of the Strong Heart Study when she noted what a wonderful experience it has been working with the team over the years to consistently demonstrate that excellent research can be done in Indian Country. Dr. Elisa Lee, Principal Investigator for the Oklahoma Center, suggested that the mutual respect and level of support of the communities over the years has greatly facilitated the research effort. Dr. Richard Fabsitz, NHLBI Project Officer, noted that this was the

fourth example in a row of the Strong Heart Study communities and staff delivering on the stated goals of a research study. "It is really a pleasure to be associated with this group of investigators and these communities." Dr. Jim Galloway, IHS cardiologist, noted how the Strong Heart Study data had already become a major contributor to health planning for American Indians. Efforts will now focus on analysis of these valuable data to generate information that will be useful to improve the health of individuals, their communities, and future generations of American Indians.

Strong Heart Study Generates New Information on Outcomes Related to Leg Blood Flow

The generosity and dedication to wellness of Strong Heart Study participants has resulted in the collection of a large amount of information on the health of blood vessels in the heart, neck and legs. Strong Heart scientists recently asked questions about how painless measures of blood flow to the legs and feet may be associated with risk of cardiovascular disease (CVD) and mortality. These questions are important since it is known that reduced blood flow to the legs is common in diabetes, and both conditions are related to poor health outcomes.

Blood flow to the legs can be assessed by comparing blood pressure at the ankle with blood pressure in the arm. This is called the "ankle-brachial index" or "ABI." In

healthy people, the ABI is about 1. In people who have problems with blood flow to their legs, the ABI can be less than 1 or more than 1. Previous studies have shown that a low ABI is a warning for future development of CVD. However, there are no reports on the relationship between a high ABI and future CVD. This is an important question in the Strong Heart Study, since a high ABI is common in diabetes.

Strong Heart Study scientists wanted to see if either a high or low ABI was a warning for CVD mortality in the SHS population. The results showed that both high and low ABI were associated with death due to CVD. Participants with low ABI had about 2.5 times the risk of dying due to CVD during the ten years of follow-up (when compared to those with normal

ABI). Participants with a high ABI had about twice the risk for CVD mortality compared to those with a normal ABI.

These results support earlier studies showing a relationship between low ABI and increased risk of death due to CVD, but Strong Heart Study data extended these findings to include the diverse group of American Indians in the study. In addition, data from this investigation also show a relationship between high ABI and increased risk for CVD-related mortality. This is important new information because of high rates of diabetes in the Strong Heart Study population and the increasing rates of CVD. A high or low ABI may be an important factor to measure in the doctor's office when considering a risk for CVD among American Indians.

Genes and Drug Effects

The good and bad effects of medicines depend on many things. Sometimes the food we eat with a medicine will change the way it works. Sometimes two medicines will work against each other. Some medicines have to be taken at exactly the right times, or many times a day; and it is hard to take them correctly.

Besides this, of course, our bodies are slightly different. Some people are extra sensitive to the effects of a medicine. Some of us break down medicines, or flush

them out through our kidneys or liver quicker than the next person. Many scientists think that a lot of these differences come from genes or special qualities that we inherited from our parents.

Dr. Raymond Woosley and Dr. Patricia Thompson at the University of Arizona in Tucson are especially interested in testing some of the genes that have been found to change the way people break down and get rid of medicines. In other studies, some people with certain of these genes don't pass these medicines out of their body as fast as the

average person; and so they start to build up and sometimes cause side effects. Sometimes the medicines are broken down too fast, and they don't have a chance to work like they are supposed to.

These researchers don't know if American Indian (AI) people have these same kinds of genes or not. This testing will tell us more about how AI people react to their medicines; and someday, maybe this will let doctors do a better job of prescribing a better medicine, at a dose that fits the patient better.

SANDS

Stop Atherosclerosis in Native Diabetics Study

As you may know, SANDS is a study funded by the National Institute of Health to try to reduce or prevent heart disease in Native Americans with diabetes. It is now well underway in the Phoenix, AZ, Chinle, AZ, Rapid City, SD, and Lawton, OK areas. Currently, over 250 people have been enrolled, but we need about 250 more.

The Strong Heart Study found that heart disease is rapidly increasing in Indian communities. Heart disease is caused by atherosclerosis (hardening and clogging of blood vessels). SANDS will study strategies to see if using medicines for lowering blood pressure and cholesterol can stop this from happening.

If you are interested in joining, you will be scheduled for two screening visits to obtain your medical history and measure your blood pressure and cholesterol. If you are eligible, you will be given medicines to lower your cholesterol and blood pressure, and you will be followed for 3 years. An ultrasound picture (like the one taken of babies for pregnant women) of the vessels in your neck and heart will be taken at the beginning, middle and end of the 3 years.

After you enroll you will be followed every 3 months for 3 years. During that time we will check your blood pressure and cholesterol and adjust the medicines to meet your goals. We will do this along with your regular doctor. SANDS visits

will not take the place of your regular doctor visits.

If you join the study, you will not only be followed closely for your blood pressure and cholesterol, but you will also have the satisfaction of knowing that the results from SANDS may help improve your health and the health of Native Americans with diabetes for generations to come.

If you would like to know more about SANDS, please call the SANDS clinic in your area.

Phoenix area: 1-888-90SANDS (1-888-907-2637)
Lawton area: (580) 678-0676
Rapid City area: (605) 716-4812
Chinle area: (928) 674-7589

Better Medicine Through Genetics

Most of the cells in our bodies contain 23 pairs of chromosomes. One chromosome of each pair is a copy of a chromosome we have received from our father and the other is a copy of one from our mother. All of our genes are located on these 23 pairs of chromosomes. Our genes help determine what diseases we may develop. Learning about the genes that lead to heart disease, diabetes, high blood pressure, and obesity can help us learn how to prevent and treat these diseases. One of the first steps is to find the exact

location of each gene (which chromosome is it on, and which part of that chromosome?).

In the Strong Heart Study, we are collecting information from people in large families. We ask about diseases, we evaluate disease risk factors, and we collect DNA, which is the material that genes are made of. We are using powerful computers to analyze all of this information and to try to pinpoint the locations of genes that may lead to disease. This is a big job that is just beginning to give us some results.

We know that the relationship between diseases and genes is complicated. More than one gene (perhaps many genes) may work together to influence our disease risk. The effects of these genes also may depend on things like diet, smoking, and other life style factors. If we can locate one or more genes that influence risk of heart disease or diabetes, then we can isolate the genes and find out how they work. We hope that our work will someday lead to new ways of preventing and treating diseases.

Lower-Extremity Amputation Related to Poor Health Outcomes

American Indians have very high rates of type 2 diabetes. A lower extremity amputation (LEA) is one of the most disabling complications of diabetes. LEA results from damage to the nerves and blood vessels in the legs and feet that comes from high blood sugar levels. LEAs occur with significantly greater frequency in diabetic American Indians than in diabetic people of other ethnicities. Strong Heart Study (SHS) investigators wanted to understand the long-term health consequences of American Indians with LEA. The overall results of the study showed that SHS participants with LEAs are at substantially increased risk of death from all causes and from heart disease compared to SHS participants without a LEA.

Out of 4,549 American Indians seen in the first SHS exam (between 1989 and 1991), 134 SHS participants had a LEA due to diabetes. These people represented 6% of all SHS participants

with diabetes. Eighty people had a toe amputation, 53 had an amputation below the knee (BKA) and 1 person had an amputation above the knee (AKA). Participants with a LEA had higher systolic blood pressure and LDL cholesterol levels than people without a LEA, and they also had worse kidney function and circulation in their legs compared to people who did not have a LEA.

Investigators discovered that a participant's risk of experiencing a LEA increased with the time he or she has had diabetes. In addition, diabetes duration was longer in those who had "more" of the leg amputated. For example, participants with a toe amputation had an average diabetes duration of 19 years; participants with a BKA had an average diabetes duration of 21 years, and the participant with an AKA had diabetes for 34 years.

LEA increased the risk of death, even when diabetes duration was taken into account.

Of the 134 LEAs, 107 were in Arizona, 14 in the Dakotas and 13 were in Oklahoma. The higher number of LEAs in the Arizona center may be due to the fact that average diabetes duration was longest in that center.

These findings highlight the need for American Indians to control their blood sugar levels and practice proper foot care in order to prevent damage to the extremities that can lead to an LEA. In people who already have a LEA, it is important to control blood sugar levels and seek regular medical care to control risk factors such as kidney disease, high blood pressure and high cholesterol. Diabetes prevention among non-diabetic individuals is also essential.

This investigation, entitled *Prevalence and Long-Term Follow-up of Diabetes-Related Lower Extremity Amputation in American Indians*, is currently being submitted for publication.