

Teen arteries show early signs of plaque

Preliminary results from a multicenter study show that teenagers can develop well-established fatty streaks in their coronary artery walls, and that some teens even develop artery-narrowing plaque. The findings add weight to previous research suggesting the first stages of coronary artery disease can begin early in life. In complementary work, other project scientists have borrowed a computer technique from the space program to identify specific arterial sites where the relatively harmless fatty streaks seem most likely to progress to full-fledged atherosclerotic plaque, which can lead to heart attacks.

Research indicating that coronary artery disease begins in childhood stems from now-classic studies of U.S. soldiers killed in Korea and Vietnam. Scientists found some of these young men had advanced plaque buildup on the walls of their heart arteries. More recently, the ongoing Bogalusa (La.) Heart Study uncovered evidence of fatty streaks in children's arterial walls and showed that children with high blood cholesterol are likely to remain at risk of elevated blood cholesterol as they grow older (SN: 10/8/88, p.234).

Now, early results of another ongoing study, called Pathobiological Determinants of Atherosclerosis in Youth (PDAY), confirm that by the time a person reaches age 19, smooth fatty streaks can form beneath the endothelial tissue lining the insides of arteries, developing into raised lesions by age 34. Henry C. McGill Jr. of the University of Texas Health Science Center at San Antonio presented the preliminary results this week at the American Heart Association's Science Writers Forum in San Antonio.

PDAY investigators obtain blood and coronary artery samples from the legally required autopsies of trauma victims aged 15 to 34. They test the blood for cholesterol and examine the artery specimens for signs of disease.

Analysis of data from about 300 cases shows that the teenagers and young adults who had high blood levels of low-density lipoprotein (LDL) cholesterol at the time of autopsy were more likely to show raised, artery-narrowing lesions on vessel walls, McGill says. LDL transports cholesterol to artery walls, where deposits may form. Conversely, subjects who had elevated blood levels of high-density lipoprotein (HDL) at the time of autopsy were less likely to show such lesions. Scientists believe high blood levels of HDL help ward off artery disease because HDL transports cholesterol to the liver for excretion. The PDAY researchers also found that people with high concentrations of thiocyanate, a chemical found in the blood of cigarette smokers, were more likely to have advanced lesions than

were those whose blood showed no trace of it.

In a related PDAY effort, J. Fredrick Cornhill and his colleagues at Ohio State University in Columbus have created composite views of how atherosclerosis may progress, using a computerized method similar to the photo-enhancing technique used by Voyager 2 scientists. The Ohio team has photographed coronary artery tissue taken from 504 of the deceased trauma victims in the PDAY project and converted each photograph to a digitized image made up of 4 million separate points. Composite images incor-

porating data from the various photographs show that certain sites, including those where arteries bend or branch, are especially prone to developing fatty streaks in youths aged 15 to 19, Cornhill reports. Fatty streaks form when white blood cells become engorged with fats and cluster beneath the endothelium. Cornhill says the same trouble spots identified in youths often display full-blown raised lesions in composite images reflecting data from people aged 30 to 34.

That finding suggests specific areas of the vessel wall are at risk of developing atherosclerotic lesions over the years, he says. His team is now working to produce a map of lesion-prone arterial sites.

— K.A. Fackelmann

Computers get a boost as psychotherapists

Psychotherapy may be going from the couch to the computer. In a pilot study reported in the *JANUARY AMERICAN JOURNAL OF PSYCHIATRY*, investigators found that a computer programmed to use specific psychological techniques is as effective in relieving mild to moderate depression as a human therapist using the same approach.

The results do not suggest flesh-and-blood therapists are irrelevant in treating depression, but "there's definitely a place for computers in the mental health field," says study director Paulette M. Selmi, a psychologist with a private practice in Mesa, Ariz.

Selmi devised a computer treatment program that operates on the tenets of cognitive-behavioral therapy, which stresses practical exercises to change thoughts and behaviors contributing to depression. Numerous studies have documented the effectiveness of cognitive-behavioral treatment when administered by a trained therapist. The computer program did not interpret what people divulged about their lives or carry on a dialogue with them, Selmi notes. It simply incorporated their answers to open-ended and multiple-choice questions into recommendations for overcoming self-defeating attitudes and actions.

Selmi and her colleagues randomly assigned each of 36 volunteers, all reporting symptoms of mild or moderate depression, to one of the following: computer treatment, sessions with a therapist, or a waiting-list control group. The first two groups attended six weekly therapy sessions. For those undergoing computer treatment, an experimenter helped start and stop each session and answered any questions that arose, most of which concerned computer procedures.

Two months after the therapy sessions ended, eight people in the computer group and nine people in the therapist group reported a significant mood improvement, compared with one person

on the waiting list.

The human therapist — psychologist Steven P. Sorrell of the University of Wisconsin-Madison — modeled his technique on the capabilities of the computer program, which somewhat limited his flexibility during therapy sessions, Selmi points out. Furthermore, a typical course of cognitive-behavioral therapy would involve about 20 sessions.

But the success of any form of therapy often relies on factors other than technique, such as the patient-therapist relationship. In the computer group, the novelty of the method may have influenced patient improvement, Selmi notes. The computer also served as an electronic journal in which patients wrote down their thoughts and reviewed them; many volunteers cited this as an advantage of computer therapy, she says.

"Some people related to the computer as if it were a person," Selmi adds. For instance, at the end of the first session, five computer-treated patients said they perceived "therapist understanding."

Although the study must be extended to depressed people treated at mental health clinics, "this is exciting work," says psychiatrist Aaron T. Beck of the University of Pennsylvania in Philadelphia, who originated cognitive therapy in the 1960s. Further development of Selmi's computer program may help ease the shortage of cognitive therapists and reduce the costs of therapy, Beck asserts. Therapists could then concentrate on more severe cases of depression, consigning milder cases to the computer.

Selmi, however, contends computers probably will work best when combined with traditional cognitive therapy. They are especially well suited to handle the educational techniques of such therapy, she maintains.

"Even though I developed this computer program, I guess I'm just a conservative clinician," Selmi says. "I don't think computers should replace human therapists."

— B. Bower