Genes Play Bigger Role in MI Than in Stroke

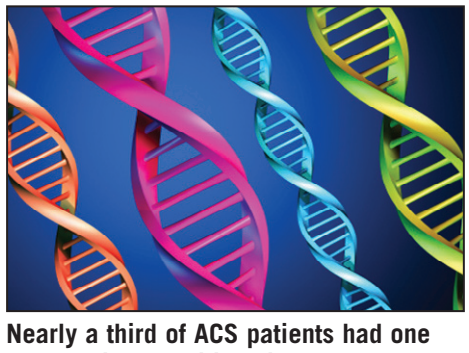
BY MICHELE G. SULLIVAN

FROM CIRCULATION: CARDIOVASCULAR GENETICS

People whose mother and father have both had a myocardial infarction are six times more likely to have one than are those without a parental history, according to a large, population-based study.

Strokes, on the other hand, do not seem related to genetic predisposition.

Because most risk-estimation models include both cardiovascular and cerebrovascular factors, the findings could influence the way such risks are calculated, Dr. Peter Rothwell and colleagues wrote.



©KATIV/ISTOCKPHOTO

Nearly a third of ACS patients had one parent with a positive history of MI.

"The way physicians predict the odds of a healthy person suffering a heart attack or stroke needs refining," Dr. Rothwell, senior author and professor of neurology at Oxford (England) University, said in a press statement. "Currently, most risk models lump a patient's family history of stroke and heart attack together. We probably should model family history of stroke and heart attack separately in the future."

Dr. Rothwell and his coauthors reported a subanalysis of the Oxford Vascular Study (OXVASC), a population-based study of transient ischemic attacks, strokes, acute coronary syndrome (ACS), and acute peripheral vascular events in 91,106 people. They focused on 1,921 patients who had ACS or stroke and had information on cardiovascular and cerebrovascular events in both their parents and siblings. Among these, 906 had experienced an ACS and 1,015 some kind of cerebrovascular event (Circ. Cardiovasc. Genet. 2011 July 26 [doi:10.1161/CIRCGENETICS.110.959114]).

The authors found clusters of ACS in many families: 21% of patients (191) had at least one sibling who had had an MI and 7% (64) had at least two siblings with the event. There was also a strong parental influence. Nearly a third of patients (277) had one parent with a positive history of MI and in 5% (47) both parents had a positive history.

VITALS

Major Finding: Heart attacks are significantly more likely than are strokes to occur in family clusters, with 21% of heart attack patients having at least one similarly affected sibling, compared with 8% of stroke patients.

Data Source: A subanalysis of more than 91,000 subjects who had experienced either a heart attack or stroke.

Disclosures: The study was primarily sponsored by the U.K. Medical Research Council. None of the authors had any financial disclosures.

The associations were not as strong in patients with cerebrovascular events. Of these patients, 8% (82) had least one sibling with a stroke history and 1% (14) at least two siblings with a history. Twenty-one percent (216) of patients had one parent with a positive history, while 2% (21) had two parents with a positive history.

When the investigators considered the proband families, they found significant relationships between the number of affected parents and the number of affected siblings. The ACS patients' 2,601 siblings were 48% more likely to have had an ACS when one parent had a positive MI history and six times more likely when both parents did.

These associations were not significant among stroke patients, however. Among the 2,692 siblings of the stroke patients, there were no significant relationships with parental history of stroke (either one or both parents).

The study plays into the knowledge that atherosclerosis and plaque – the main risk factors of MI – are more heritable than thromboembolism and small-vessel disease, which are the main risk factors for stroke.

"Coronary disease may be a better indicator of generalized atherosclerosis than stroke, and therefore family history of MI may represent a greater risk factor for MI and stroke, whereas family history of stroke is not a strong risk factor for MI," Dr. Rothwell and his associates said. ■

'Cool-It' Cardiac Arrest Protocol Curbs Neurologic Damage

BY MICHELE G. SULLIVAN

FROM CIRCULATION

A protocol of in-field cooling quickly followed by rapid in-hospital hypothermia positively affected neurologic outcomes in patients with cardiac arrest – even among the elderly and those with non–ventricular fibrillation arrest and cardiogenic shock.

In a prospective study of 140 patients, 56% survived to hospital discharge. Of these, 92% had positive neurologic outcomes, compared with 77% of survivors before the hospital developed its integrated hypothermia program, wrote Dr. Michael Mooney and his colleagues (Circulation 2011 July 11 [doi:10.1161/circulationaha.110.986257]).

The study also determined that each 1-hour delay in initiating hypothermia among out-of-hospital cardiac arrest decreased the chance of survival by 20%. Therefore, the authors wrote, "it is recommended that therapeutic hypothermia protocols should include a prehospital cooling component. Education and resources should be directed toward emergency medical services and community hospitals to ensure execution of the simple but seemingly effective practice of initiating cooling with ice packs immediately on return of spontaneous circulation."

Dr. Mooney, director of the therapeutic hypothermia program at the Minneapolis Heart Institute, and his colleagues tracked 140 patients with out-of-hospital cardiac arrest during 2006-2009. All patients remained unresponsive despite the return of spontaneous circulation. They were all treated according to the hospital's 2006 "Cool It" initiative – a multidisciplinary care system that allows EMS personnel to begin the cooling procedure after circulation returns and stresses rapid transfer to a hospital capable of therapeutic cooling.

VITALS

Major Finding: Therapeutic hypothermia for cardiac arrest patients – beginning in the field and completed in a hospital – was associated with good neurologic outcomes in 98% of patients who survived to hospital discharge.

Data Source: A 4-year prospective study of 140 patients with out-of-hospital cardiac arrest.

Disclosures: The study was sponsored by the Minneapolis Heart Institute Foundation. None of the authors declared any financial disclosures.

The procedure begins with cardiac arrest guidelines established by the American Heart Association, followed by noninvasive body cooling. Ice packs are placed at the patient's groin, head, neck, and chest during the first phase of management and transport to a Minneapolis Heart Institute–affiliated hospital.

As soon as EMS identifies a candidate patient, the complementary hospital program kicks into gear. When a patient arrives, a cardiologist and intensivist are ready to implement the standardized therapeutic cooling protocol; if the patient arrives at a nonaffiliate hospital, the emergency department staff initiates the procedure and then transfers the patient to a facility capable of complete therapeutic cooling.

The target body temperature is 33° C. After 24 hours, rewarming proceeds at a rate of 0.5° C/hour until the core temperature reaches 37° C – usually 8 hours.

The mean age of the 140 patients followed was 62 years, with 30 being older than 75 years. Most (102) had ventricular fibrillation or tachycardia; other presenting factors included asystole or pulseless electrical activity (32), ST-segment myocardial infarction (68), and cardiogenic shock (61). EMS personnel initiated some kind of cooling in 43% of the patients.

Most (75%) were taken to a hospital not equipped to administer therapeutic cooling and were transferred to one of the target facilities; the mean transfer distance was 56 miles, although some traveled up to 173 miles. The median time from return of spontaneous circulation to in-hospital cooling was 117 minutes.

Invasive cardiac interventions were performed in most of the patients, with angiography in 101 and percutaneous coronary intervention in 56.

Of the entire cohort, 78 patients (56%) survived to discharge. Of these 78 survivors, 72 (92%) had a good neurologic outcome, defined as a Cerebral Performance Category score of 1 (good) or 2 (moderate disability). Mortality and poor neurologic outcome were significantly related to advanced age (more than 75 years), asystole, or pulseless electrical activity, and cardiogenic shock.

Survival rates were not significantly different among those who arrived at a hypothermia treatment facility and those who did not (52% vs. 57%).

Two other significant prognostic factors were time between arrest to the return of spontaneous circulation and time of returned circulation to application of therapeutic cooling. A total of 36% of those with a circulatory down time of more than 30 minutes survived to hospital discharge. When therapeutic cooling began more than 2.5 hours after circulation returned, patients were 65% less likely to survive.

"When modeled continuously, the relative hazard estimate for a 1-hour increase in time from return of spontaneous circulation to first cooling was 1.20, indicating that for every 1 hour in delay to initiation of cooling, the risk of death increased by 20%," the authors wrote.

Over the study period, the authors also tracked their progress in time to cooling time. The median time from circulatory return to target temperature improved from 345 minutes to 258 minutes. The median time from circulatory return to first cooling shortened by 2 hours, "reflecting increased efforts to initiate early surface cooling," the authors said.

"Through ongoing education and outreach, the proportion of cases receiving some cooling before arrival at [a therapeutic cooling facility] has risen consistently and dramatically, from [6% in year 1 to 69% in year 4]," they noted. ■