

Drug fails to arrest cardiac aftereffects

Imagine the unthinkable: Your heart suddenly stops beating. Within minutes, paramedics jump-start it with an electrical jolt and rush you to a nearby hospital emergency room. But even with such rapid treatment, you face more than a 50-50 chance of dying from the cardiac arrest. And if you survive it, you may suffer lingering brain damage.

That's because scientists have yet to discover a way to block the damaging aftershocks of cardiac arrest. When the fist-sized heart muscle stops pumping blood, calcium rushes into cells throughout the body. This microscopic event interferes with the cells' energy-producing machinery, often destroying particularly vulnerable cells such as those in the heart and brain.

Animal studies have suggested that drugs called calcium-channel blockers can protect fragile brain and heart cells after heart stoppage. But bad news about calcium-channel blockers surfaced late last year, when a Finnish team reported that one such drug, called nimodipine, failed to guard against calcium-inflicted damage in most men and women who had suffered cardiac arrest.

A large, international research team now reports discouraging results with another calcium-channel blocker, called lidoflazine.

"The bottom line is this particular drug doesn't work," concludes cardiac-care specialist Norman S. Abramson, who co-directed the study with Peter Safar, a colleague of his at the University of Pittsburgh. Nonetheless, the study may point the way to an effective weapon against the brain-damaging aftermath of cardiac arrest, they say.

The international team studied 516 people whose hearts had stopped beating, including victims of heart attack, severe asthma and other respiratory difficulties that can trigger cardiac arrest. All 516 men and women remained in a coma for at least 10 minutes after emergency treatment to restart the heart. Within 30 minutes of restarting the heart, the investigators randomly assigned each patient to one of two groups to receive intravenous infusions of either lidoflazine or placebo solution. Because the solution vials were coded, the researchers remained unaware of who got the placebo and who got the experimental drug.

After six months, the team found that lidoflazine had provided no survival benefit: 82 percent of the lidoflazine group and 83 percent of the placebo group had died at some point after the cardiac arrest, in most cases succumbing to serious brain injury or a second heart

attack.

And among the survivors, the experimental drug proved no more likely to stave off brain damage than did the placebo. In the May 2 *NEW ENGLAND JOURNAL OF MEDICINE* the investigators report that 15 percent of the lidoflazine group, compared with 13 percent of the controls, showed good recovery of brain function at the end of the six months.

Even so, Safar remains hopeful about lidoflazine's ability to minimize brain damage. For instance, he told *SCIENCE NEWS*, unpublished data from the same study hint that lidoflazine may provide some brain protection to a subgroup of cardiac arrest patients — those who show stable blood pressure soon after the arrest. He declined to elaborate on this preliminary finding.

It remains unclear why the drug failed in its mission to protect brain and heart cells from the toxic effects of calcium, notes Fred Plum of the Cornell Medical Center, who wrote an editorial accompanying the lidoflazine report. In future studies, he says, scientists may find that the drug didn't reach damaged areas of the heart and brain quickly enough and/or in sufficient concentrations.

On the other hand, adds Abramson, it may take several drugs to safeguard the heart and brain against the destructive cascade triggered by reduced blood flow. "We have a long way to go," he says.

— K.A. Fackelmann

NAS: Act now to reduce global warming

Despite uncertainties in the science of predicting global climate change, the National Academy of Sciences (NAS) urges immediate action to curb greenhouse-gas emissions by reducing fossil-fuel consumption, promoting energy conservation, and improving solar and nuclear-energy technologies. For a very low cost, says NAS President Frank Press, the United States could reduce its greenhouse-gas emissions by 10 to 40 percent.

According to White House Science Adviser D. Allan Bromley, the NAS recommendations "are very similar to actions already taken or being proposed by the Bush administration." Both Press and Bromley testified before the Senate Committee on Commerce, Science and Transportation last week.

"The possibility of ecological disaster due to an increase in global temperature is sufficient reason to act now," Press warned. Outlining recommendations in "Policy Implications of Greenhouse Warming," an NAS report released April 10, he advocated a variety of low-cost steps aimed at reducing emissions of the major greenhouse gases — carbon dioxide, methane, chlorofluorocarbons and nitrous oxide.

For instance, the academy report recommends adopting nationwide energy-conserving changes in building codes for residential and commercial structures, boosting the average automobile-fuel efficiency 18 percent (to 32 miles per gallon) and substituting compact fluorescent lights for incandescent bulbs in homes and businesses.

Together, the measures described in the new report are designed to head off a predicted 1° to 5°C increase in global temperature by the year 2050, Press said. Enactment of these steps — which the report estimates would cost between \$4 billion and \$30 billion — could reduce the heat-trapping equivalent of 3.6 billion metric tons of carbon dioxide emissions per year, or about one-third of last year's U.S. greenhouse-gas emissions.

However, the report cautions that even at reduced emission rates, total greenhouse gases might still increase if population and industrial activity increase faster than predicted.

The NAS recommendations "parallel" actions specified in the President's National Energy Strategy released in February, Bromley testified. But committee member Sen. Albert Gore Jr. (D-

Tenn.) disagreed, charging instead that many administration policies are "simply in opposition to the recommendations in this report." He warned Bromley that "history will judge the Bush administration harshly if its current inactivity on global warming continues."

While the NAS report stopped short of calling for penalties and higher taxes for major producers of greenhouse gases — which some European nations have imposed — environmental groups generally approve of the new recommendations. "This report should remove any lingering doubts that more time is needed to study global warming before we act," says William A. Nitze, president of Alliance to Save Energy.

Though most environmental groups support the NAS report's call for increased funding for development of new renewable technologies, many also object to some of the report's higher-cost recommendations, including the replacement of most fossil-fueled power plants with a new generation of light-water nuclear reactors now under development. "We are strongly opposed to any effort that puts forth nuclear power as a panacea for the greenhouse effect," says Eileen Quinn of the Union of Concerned Scientists.

— T. Walker