Biology

John Travis reports from San Diego at the annual meeting of the Society for Neuroscience

Breathing a bit askew in SIDS babies

In the 1980s, scientists in the United Kingdom recorded the breathing patterns of nearly 7,000 infants ranging in age from 2 days to 65 days. The still-unexplained phenomenon of sudden infant death syndrome (SIDS) later killed 16 of those infants. Although examination of the breathing records gave no clues at the time, investigators at the University of California, Los Angeles have now found low variability in the intervals between breaths in the SIDS babies.

Without knowing during the analysis which records belonged to which babies, the researchers compared the data from all the SIDS babies and 35 of those that survived. "The respiratory system [of the SIDS babies] appears to be more rigid at slow breathing rates," says Ronald M. Harper of UCLA. "It was obvious which were SIDS babies and which were not."

Though this breathing rigidity itself does not cause death, it suggests that the brain regions that control respiration develop abnormally in SIDS infants. Pursuing this lead may allow screening for babies susceptible to SIDS, says Harper.

Young rats fill in holes in the brain

When investigators remove part of the brain of rats slightly more than a week old, the young rodents grow new nerve cells, or neurons, and recover almost completely, claim Canadian researchers. "It tells us it's possible in the mammal to regrow an injured brain," asserts Bryan Kolb of the University of Lethbridge in Alberta.

These findings, not yet published, challenge the long-held opinion that, very soon after a mammal is born, almost all the neurons in its brain lose their ability to divide. "If they have definitive evidence, that would be remarkable," says Naomi Kleitman of the Miami Project to Cure Paralysis.

She and other investigators, however, caution that past claims of nerve cell regeneration in mammalian brains, except in a few specialized regions, have not withstood rigorous scrutiny. The rodents' recovery might result instead from the reorganization of existing nerve cells to shoulder the functions of the damaged neurons.

Kolb says that he and his coworkers had seen evidence of rat brain regrowth many years ago but until recently had no way to determine whether it stemmed from new neurons, relocated neurons, or other brain cells. Over the last 3 years, they have removed small portions of the cerebral cortex from more than 100 rats. In adults rats, notes Kolb, the hole in the brain remains and their behavior is affected. In rats less than 2 weeks old, however, the hole almost vanishes within 10 days, he says. After their recovery from the brain surgery, the young animals display no major behavioral abnormalities. "The deficits are trivial," says Kolb.

To help figure out whether the cells replenishing the hole were new or previously existing brain cells, Kolb and his colleagues identified mitotic spindles, threadlike structures that partition DNA when cells divide. Also, when the investigators removed parts of the cortex, they injected a compound called BrdU into the resulting hole. Dividing cells incorporated BrdU into new DNA, signaling that new cells had been created, says Kolb.

He and his coworkers also obtained an antibody that targets neurons but no other cells in the brain. They found that the antibody tagged many, though not all, of the BrdU-labeled cells that showed up in the holes. To examine whether the healing cortex makes appropriate connections, they injected chemical compounds into brain regions that normally connect to the cortical area they had removed. After about 2 weeks, those tracers showed up in the replacement cells.

Kolb plans to look for the brain region in which the new neurons originate and for signals that tell them to start dividing.

Biomedicine

Lisa Seachrist reports from Anaheim, Calif., at the annual meeting of the American Heart Association

HIV mars heart development

Researchers know that babies infected with HIV at birth suffer a host of heart problems. Now, it appears that simply being born to a mother infected with HIV, the virus that causes AIDS, predisposes a child to developmental heart problems—even a child who remains uninfected.

Steven Lipshultz of Harvard Medical School in Boston and his colleagues studied 414 infants born to HIV-infected mothers and found that 12 percent of the children suffered from heart abnormalities, including heart wall and valve defects and poor pumping function. Only 0.8 percent of children in the general population are born with such defects.

"It's striking how abnormal the hearts of these children were," says Lipshultz. The infants received treatment for the more serious abnormalities, but some of the pumping problems improved as the babies grew.

The researchers aren't claiming that HIV itself causes defects in the heart. Instead, Lipshultz points out, pregnant women infected with HIV may have drug, alcohol, or nutrition problems that interfere with fetal heart development.

"In these moms in this state of health, we see things that are very different from the fetal development we see in healthy moms," Lipshultz points out. "We often talk about the uninfected children of HIV-infected mothers as 'healthy,' but this study indicates that, for at least the first few months, that may not be true."

Wine, beer, liquor benefit the heart

They call it the French paradox: Despite a diet high in saturated fats, the French suffer far less heart disease than do their U.S. counterparts. In studying the phenomenon, researchers noted that the French drink more red wine than people in the United States do.

Armed with that information, some scientists claimed that flavonoids in the wine serve as antioxidants, which protect the heart. Several recent studies have maintained that red wine is more healthful for the heart than other types of alcohol.

Now, scientists from Harvard Medical School in Boston report that a cold beer provides the same heart benefits as the fruit of the vine.

J. Michael Gaziano and his colleagues studied 340 men and women who had suffered heart attacks and compared their drinking habits to those of an equal number of healthy people of the same ages. The team found that drinking one-half drink to two drinks—regardless of the type of alcohol—per day reduces the risk of a heart attack by 45 percent. Moreover, beer, wine, and liquor all raised the concentrations of HDL, or "good," cholesterol in the blood by 10 percent.

Gaziano maintains that the increase in HDL explains the reduction in heart attack risk. "Two martinis is no different from two glasses of red wine," he says.

That's not to say that flavonoids don't benefit the heart. John D. Folts of the University of Wisconsin–Madison maintains that it takes a lot of alcohol—three times the legal limit for driving—to help the heart by reducing platelet activity.

He and his colleagues studied the effects of a capsule form of flavonoids on blocked arteries in monkeys. The flavonoids worked as well as, if not better than, aspirin at turning down the platelet activity and thus unblocking the monkeys' arteries.

There is an advantage to flavonoids. "Adrenaline can completely wipe out aspirin's beneficial effects," says Folts. "But adrenaline doesn't affect the flavonoids."

Whether it's the alcohol alone or the flavonoids in the alcoholic beverages, a drink a day may protect the heart. But before you say, "Bottoms up!" Gaziano cautions, remember that drinking more than moderate amounts of alcohol damages the heart.