Biology

Elizabeth Pennisi reports from Washington, D.C., at the annual meeting of the Society for Neuroscience

Memory loss tied to stress . . .

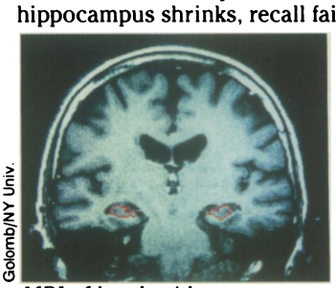
Some older people remain quite sharp, while other, seemingly healthy individuals become ever more forgetful with age. Stress can be the cause, say Canadian psychiatrists. High amounts of cortisol, a stress hormone made by the body, correlate with subtle memory and attention problems, report Michael J. Meaney and his colleagues at McGill University in Montreal.

Once a year for the past five years, the McGill team has checked the concentration of the stress hormone in the blood of 130 healthy volunteers age 55 to 87. Also, a psychiatrist who does not know the hormone status has tested the cognitive skills of a subset of these volunteers.

"We now realize that stress hormones are a double-edged sword," concludes Meaney. People with high concentrations of cortisol in the blood remember what they learned long ago but forget things they are just told, says Sonia Lupien of McGill. This subtle memory loss resembles what occurs when a part of the brain called the hippocampus is damaged, she adds.

. . . and to shrinking brains

Research on the hippocampus, a part of the brain deemed critical for memory and learning, shows that when the hippocampus shrinks, recall fails. James Golomb of New York University studied 54 healthy individuals age 55 to 87. Using magnetic resonance imaging, he and his colleagues imaged the volunteers' brains. They measured the size of the hippocampus and a similar brain lobe not known to be involved in memory or learning. Also, they assessed whether the brain had atrophied overall. The researchers then tested the participants' immediate recall and their recall after a few minutes.



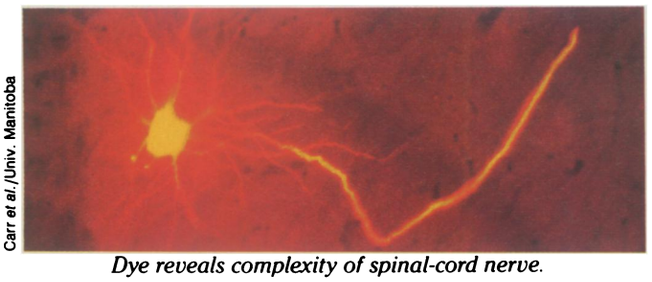
Golomb/NY Univ.

MRI of head, with hippocampus marked (red).

The poorer the ability to recall words and pictures after a delay, the smaller the hippocampus, Golomb reports. Time will tell whether the shrinkage, sometimes up to 10 percent of normal brain size, represents the earliest stages of Alzheimer's disease, he says. If so, such imaging may one day provide a way to test for this disease, he adds.

Color-by-number neurons

In the study of nervous systems, staining represents a useful but often tedious and expensive technique for making nerves visible. Now, neurobiologists in Canada say they have developed a new dye procedure that's quick and easy and lets researchers monitor cells' electrical and chemical activity. Patrick A. Carr of the University of Manitoba in Winnipeg injects the dye, tetramethylrhodamine, through an electrode inserted into the nerve cell under study. The sugar part of the dye molecules makes it easy for the dye to get to the far reaches of the cell. "We see fine cellular processes that we couldn't see before," Carr says.



Carr *et al.*/Univ. Manitoba

Dye reveals complexity of spinal-cord nerve.

Biomedicine

Kathy A. Fackelmann reports from Atlanta at the 66th scientific sessions of the American Heart Association

Blood substances linked to heart risk

Although women do get heart disease, they often start developing it later in life, about a decade after their male counterparts.

Researchers had long postulated that this advantage was due to estrogen, the hormone that is plentiful during a woman's youth but declines sharply as she experiences menopause.

A new study puts a twist on that theory. The findings suggest that the body's blood-clotting system may also play a role in the heart protection enjoyed by premenopausal women.

Otavio C.E. Gebara of the Harvard Medical School in Boston and his colleagues focused on a substance in the blood called plasminogen activator inhibitor (PAI). One of PAI's main duties in the bloodstream is to block the action of the clot-buster tissue plasminogen activator (TPA), which is produced by certain blood vessel cells. A synthetic form of TPA is now used as a drug to dissolve clots. Such clots can block the heart's blood supply and cause heart attacks and strokes.

The researchers studied blood samples taken from 766 women and 682 men who were part of the Framingham Heart Study, a long-running investigation of cardiovascular disease. The team discovered that concentration of PAI in the blood were lower in premenopausal women than in men of the same age. The scientists believe that lower PAI concentrations translate into blood that is less likely to form clots. With less PAI around, TPA is freer to exert its clot-busting talent, they note.

After menopause, however, PAI concentrations in women start to look more like those in age-matched men, Gebara says. Even more important, women getting estrogen-replacement therapy after menopause had decreased amounts of PAI, more like those of premenopausal women.

The researchers suspect that estrogen may regulate how much PAI gets into the bloodstream. "The correlation between PAI levels and estrogen status points to a possible mechanism through which estrogen may exert its protective effect," Gebara says. The team plans a new study to prove that estrogen has a direct effect on PAI.

Sex and the risk of heart attack

The fear of having sex while recovering from a heart attack may be unfounded. Indeed, a new study suggests sexual activity is no more risky for the heart than getting out of bed in the morning.

James E. Muller of the New England Deaconess Hospital in Boston and his colleagues had been studying events that seem to trigger a heart attack. Previous work by others had suggested that people suffer from more heart attacks during the early morning hours, a time when the blood is more likely to form clots that can cause a heart attack (SN: 4/10/93, p.239).

In the more recent research, the Deaconess investigators surveyed 1,712 people who were in the hospital recovering from a heart attack. They asked each volunteer to recall what they were doing in the two hours before they had the attack.

An analysis revealed that sexual activity and getting out of bed in the morning can each increase the risk of having a heart attack by about two times.

Many partners of people who have had a heart attack remain anxious about engaging in sexual activity, in part because of anecdotes about the risk of sex. For people who've had a heart attack in the past, the absolute risk of having a heart attack during any given hour is 10 in 1 million. Muller's research shows that sexual activity doubles that risk: The absolute risk of having a heart attack within two hours of sex jumps to 20 in 1 million.

"These results confirm anecdotal reports that sexual activity can trigger a heart attack, but more importantly they demonstrate that the absolute risk is very low," Muller says.