

Smoking out nicotine's impact on colitis

Prior to the 1950s, manufacturers promoted cigarette smoking as a healthful habit that encourages relaxation and aids weight control. A new study hints that, in some cases, nicotine may have medicinal value for people afflicted with a debilitating digestive disorder.

That preliminary finding is "certainly not a reason to smoke," comments gastroenterologist Stephen B. Hanauer of the University of Chicago Medical Center. Extensive evidence links cigarette smoking with an array of health hazards, including cancer, he cautions.

The latest twist on the nicotine story began more than a decade ago, when gastroenterologist John Rhodes noticed something curious about people with ulcerative colitis, an inflammation of the lining of the colon that causes bloody diarrhea, severe cramping, and weight loss. Most of these patients did not smoke, he reported in 1982. In addition, smokers who suffered from ulcerative colitis often reported controlling their symptoms with cigarettes. Could nicotine protect against this condition?

To answer that question, Rhodes, of the University Hospital of Wales in Cardiff, and his colleagues recruited 72 ulcerative colitis patients. All 72 of the patients had a worsening condition, despite treatment

with conventional anti-inflammatory drugs.

The researchers randomly assigned about half the patients to a group that received nicotine skin patches, which are used by smokers to help them quit smoking (SN: 12/14/91, p.390). The remaining patients got a patch containing an inactive substance. All participants continued taking their usual anticollitis drugs throughout the study. Neither patients nor researchers knew whether a patch contained nicotine or the dummy substance.

After 6 weeks, the scientists discovered that 17 of the 35 patients in the nicotine group reported complete symptomatic relief of their colitis. By contrast, just 9 of 37 people in the placebo group got such a reprieve. The researchers describe their study in the March 24 *NEW ENGLAND JOURNAL OF MEDICINE*.

The nicotine patches produced side effects, such as nausea, dizziness, headache, sweating, and tremor, in some people. However, the recruits did not seem to suffer withdrawal symptoms when their steady source of nicotine was removed, Rhodes says. It may be that addiction occurs only with the sharp increase in nicotine concentrations in the blood that occurs when a person repeatedly drags

on a cigarette, the researchers speculate.

This is the first double-blind, placebo-controlled trial to suggest that nicotine may ease the symptoms of colitis, notes William J. Tremaine of the Mayo Clinic in Rochester, Minn. Drugs commonly used to treat colitis, such as steroids and nonsteroidal anti-inflammatory medications, don't always work and can cause severe side effects, he adds.

Tremaine and his coworkers are conducting a similar study, one that may confirm nicotine's beneficial effects for people with colitis. Yet even if additional research confirms its efficacy, nicotine's role in treating ulcerative colitis may be limited. "It is not a cure for the disease," Hanauer says, noting that the safety of administering this substance remains to be demonstrated. Tobacco companies have recently come under attack for manipulating concentrations of nicotine, a substance widely considered addictive, in their products (SN: 3/19/94, p.190). Hanauer wrote an editorial that appears in the same issue of the journal.

If scientists find a mechanism by which nicotine prevents colitis, they might be able to figure out what causes this disorder. And such understanding could lead to better therapy for this enigmatic disease, Hanauer adds. Nicotine may quiet colitis symptoms by stimulating the production of protective mucus lining the colon, he adds. — K.A. Fackelmann

Brain scans show two-sided memory flow

Brain-imaging studies suggest that a cellular information highway speeds through disparate parts of the brain to coordinate memories for personally experienced events, also known as episodic memories. Researchers now offer the first data suggesting that this memory thoroughfare turns left at the front of the brain to store recollections and veers right to retrieve them.

Positron emission tomography (PET) images show that blood flow jumps sharply on the left side of the prefrontal cortex — which lies just behind the forehead — as novel information enters episodic memory, argue Endel Tulving, a psychologist at the University of Toronto, and his colleagues. In contrast, Tulving's group finds that blood surges in the right prefrontal cortex as episodic memories resurface.

"Prefrontal asymmetry in episodic memory has not been previously reported, or even suspected," Tulving says.

Tulving and his associates cannot yet identify precise prefrontal regions involved in different facets of episodic memory. The new data and the few related PET studies of human memory — most of which concentrate on learning, or "encoding," of new information —

support a general split between left-side storage and right-side retrieval, the scientists hold.

The team describes its PET experiments in the March 15 *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES*.

In one study, 12 right-handed men age 21 to 35 studied two lists of common nouns presented on a computer screen as they lay under a PET scanner. For one list, participants indicated whether words contained the letter "a"; for the other, they noted whether words referred to animate or inanimate objects.

The men showed stronger memory 20 minutes later for words analyzed by meaning, compared to words perused on a letter-by-letter basis. This effect probably reflects the greater amount of brain work required by the former task, according to Tulving and his coworkers.

Moreover, PET scans displayed substantial blood-flow rises in the left prefrontal cortex during performance of the noun-meaning task.

Left prefrontal activation encourages storage of new verbal material interpreted in light of prior general knowledge, the investigators contend.

In a second study, 12 right-handed men age 19 to 30 listened to a tape-

recorded list of novel word definitions, such as "a form of recreation for the jumpy — trampoline." The next day, while lying under the PET scanner, they heard previously studied and new word definitions. Novel information triggers more mental work than familiar material, the researchers note.

Mathematical subtraction of PET images obtained during presentations of new definitions from those acquired during study of familiar definitions yielded areas of greatly increased blood flow in the right prefrontal cortex.

This part of the brain apparently helps to reclaim information from episodic memory, the researchers maintain.

Blood-flow data revealed several other brain regions that help to store and retrieve episodic memories, they add.

Prefrontal asymmetry on the tasks used by Tulving's group may reflect general brain processes, such as response generation, rather than memory, contends Larry R. Squire, a memory investigator at the Veterans Affairs Medical Center in San Diego.

"We need to see if prefrontal asymmetry generalizes to other encoding and retrieval tasks for episodic memory," adds Steven E. Petersen, a neuroscientist at Washington University School of Medicine in St. Louis.

— B. Bower