Low cholesterol and heart attacks

Although high levels of cholesterol in the blood are a well-accepted heart attack risk factor, scientists disagree over whether or not a low-cholesterol diet can prevent heart attacks (SN: 5/31/80, p. 343; 6/7/80, p. 357). And now the ability of anti-cholesterol drugs to prevent heart attacks also appears questionable, according to a team of World Health Organization scientists. In fact, the anticholesterol drug under study — clofibrate — may increase the risk of death from heart attack and other causes. These findings, the scientists report, are "totally unexpected."

H. Geizerova of the Institute for Clinical and Experimental Medicine in Prague, Czechoslovakia, and other WHO investigators conducted a clinical trial between the late 1960s and the mid 1970s to determine if the drug clofibrate could reduce blood levels of cholesterol and, in turn, protect against heart attacks. Approximately 5,000 men with high levels of serum cholesterol received clofibrate for an average of 5.3 years, while two other groups of 5,000, one with high levels of blood cholesterol and one with low levels of blood cholesterol, received a placebo (an olive oil capsule) for a comparable period.

In 1978, the researchers reported a 25 percent reduction in nonfatal heart attacks among the clofibrate-receiving subjects compared with the control subjects with high levels of cholesterol. There was, however, no significant difference in the number of *fatal* heart attacks between the two groups. Moreover, a significantly higher number of deaths from a variety of causes was found among the clofibrate subjects compared with the high-cholesterol control group, implying that clofibrate was not only ineffective against fatal heart attacks but dangerous as well.

Now, in a four-year follow-up study reported in the Aug. 23 LANCET, the researchers find that the group who received clofibrate still shows a higher number of deaths from a variety of causes, including heart attacks, than does the high-cholesterol control group. In addition, deaths from causes other than heart attacks are higher among subjects who received clofibrate than among the low-cholesterol group. "The implications that there may be a continuing adverse effect on the treated men after leaving the trial is serious," the researchers write.

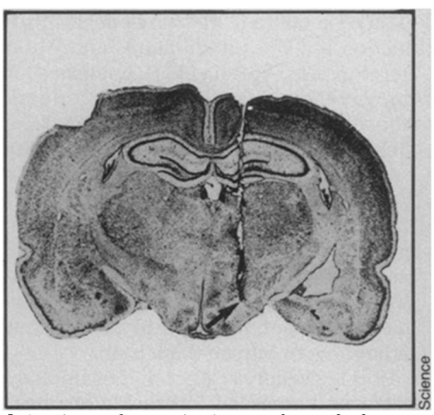
The researchers suggest that clofibrate might act by producing a persistent loss of tissue cholesterol over a period of years, thus impairing cell function. This suggestion is supported by earlier findings of a higher number of noncardiovascular deaths among subjects whose blood levels of cholesterol were lowered by a low-saturated-fat, high-polyunsaturated-fat diet than among control subjects. □

Hypothalamic link with GI tract

The link between the hypothalamus of the brain and the gastrointestinal tract, while real enough, has always been a strange one. Why, for instance, are proteins that are commonly found in the gastrointestinal tract also detected in the hypothalamus (SN: 1/27/79, p. 57; 1/19/80, p. 41)? Part of the answer may lie in the increasingly apparent control of the hypothalamus over the GI tract, according to a report in the Sept. 5 SCIENCE by Barry L. Tepperman and Mark D. Evered of the University of Western Ontario.

The peptide hormone gastrin is secreted by the lower part of the stomach when it is full of food. Gastrin then travels into the bloodstream and acts on the upper part of the stomach to stimulate the production of gastric acid. Gastrin is also one of the gut proteins recently found in the hypothalamus. So Tepperman and Evered attempted to determine if gastrin in the hypothalamus might influence gastrointestinal function.

They injected gastrin into the hypothalami of rats and measured gastric acid secretion from the animals' stomachs. Gastrin consistently caused gastric acid secretion to double or triple 15 minutes later. In contrast, the injection into the hypothalamus of other proteins common to the gut and brain did not increase stomach gastric acid output. Hypothalamic gastrin, therefore, appears to influence stomach gastric acid secretion, whereas other gut proteins in the hypothalamus do not, Tepperman and Evered conclude.

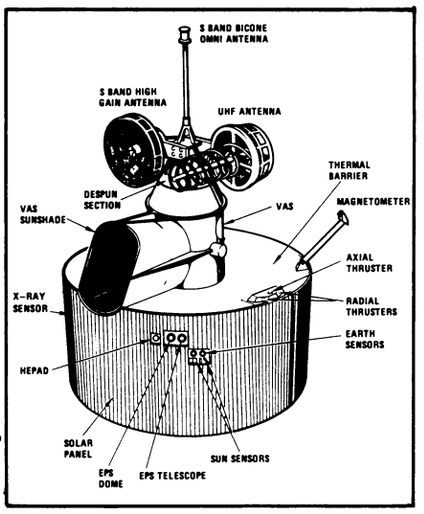


Science

Injection of gastrin in rat hypothalamus (arrow) caused secretion of gastric acid.

The researchers believe that hypothalamic gastrin influences the gut by acting as a neurotransmitter or neurohormone on the vagus nerve (which connects hypothalamus and stomach). When they severed the vagus nerve in rats, hypothalamic gastrin did not increase stomach gastric acid output. □

GOES-D launched to measure atmosphere



NASA/Hughes Aircraft

On Sept. 9, the first geostationary satellite able to take vertical readings of atmospheric moisture and temperature was launched for the National Oceanic and Atmospheric Administration. Like its predecessors in the Geostationary Operational Environmental Satellite series, GOES-D will remain continually over one spot on earth and will provide visible-light and infrared photographs of developing weather patterns every 30 minutes. Unlike other GOES satellites, however, the newcomer will also measure temperature and moisture at various levels in the atmosphere. Because storms develop vertically in the atmosphere and are fed by moisture and heat, such measurements will allow weather forecasters to track storms as they develop. Similar instruments on other satellites, such as the polar-orbiting series, do not provide information frequently enough to be useful to meteorologists. Initially, the instrument will be used on an experimental basis. □

Keeping protein destroyers in check

Bodily functions ranging from digestion to conception to the immune response depend on enzymes with a destructive capacity. The protein-cutting enzymes are useful for prompt, irreversible initiation of particular physiological processes. But when the enzymes get out of control, they can degrade body tissue, causing such diseases as emphysema, arthritis and muscular dystrophy.

Protein-cutting enzymes, which are called proteases, are held in check by molecules that inhibit their action. James C. Powers of Georgia Institute of Technology said at the recent meeting in Las Vegas of the American Chemical Society that 10