Value of Low-Sodium Diets Questioned

Some experts say that low-sodium diets are of no benefit to the general public

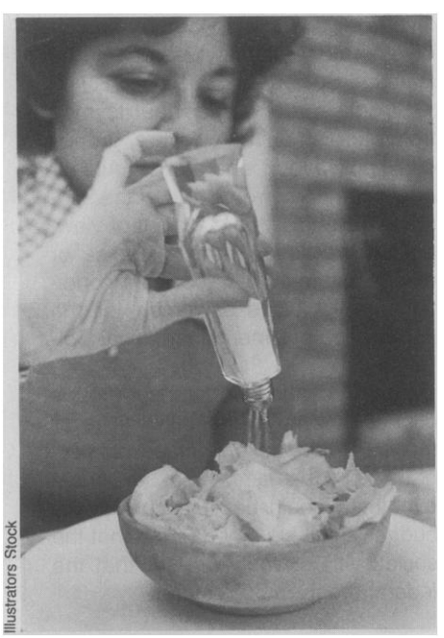
"I look forward to the day when the American public will be as conscious of sodium intake as of calorie intake," says Arthur Hull Hayes, Jr., commissioner of the Food and Drug Administration (FDA). And, indeed, the FDA and the Department of Agriculture are collaborating to drive home the message that all Americans should beware of excess salt in their diets. In radio and television spots, backed up by written material, the two agencies are telling Americans that, in Hayes' words, "Sodium reduction must remain a general health goal for our nation."

But the case for recommending that the general public reduce its sodium consumption is more tenuous than Hayes' statements indicate. John Laragh of Cornell University Medical School is adamant that things have gotten out of hand. "This whole thing has gone too far. It's a great misconception that telling Americans to reduce their sodium consumption is a public service." Graham Ward, who is coordinator for the National High Blood Pressure Education Program of the National Institutes of Health (NIH), says, "At the present time, there is insufficient scientific information on which to base a specific level of sodium intake for the general public." On the other hand, Lot Page, who is chief of medicine at Newton-Wellesley Hospital, says the evidence at hand is convincing enough to recommend that people watch their sodium consumption from infancy onwards. "I don't think you can wait for absolute certainty as a basis for public policy," he remarks.

No one denies that the evidence that a diet very low in sodium—so low that it virtually cannot be followed outside of a hospital setting—can lower blood pressure in some people with severe hypertension. There also is some suggestion that diets very high in sodium—two to four times as high as the average American's diet—can raise blood pressure in some people. The health planners, however, are talking about moderating Americans' sodium intake within a middle zone that is far from either extreme where evidence has been gathered. But, says Laragh, "No one has demonstrated that moving around in this middle zone makes any difference."

The middle zone consists of about 2 to 8 grams of sodium a day. The American Medical Association (AMA) says most doctors advise patients with hypertension to get down to 2 grams a day (about 1 teaspoon of salt) and patients with family histories of hypertension to aim for 4 grams a day. In contrast, the evidence that low-sodium diets lower blood pressure is from diets of less than 500 milligrams of sodium a day. Even getting down to 2 grams a day is difficult for most people.

Herbert Langford of the University of Mississippi Medical Center, who encourages patients with hypertension to consume no more than 2 grams of sodium a day, says this amount was chosen because it is pretty much the lowest feasible in our society. He argues that these low-sodium diets can reduce the amount of medication needed to keep blood pressure under control and, he says, "There is a reasonable chance that the level of hypertension is affected by sodium intake." Still, he remarks, "I must admit that the evidence [that low-sodium diets help patients with hypertension] isn't ironclad. But there is no downside risk and there is a heck of a chance of benefit. To say the least [the diets] are a prudent investment for the known hypertensive." Other researchers are not so convinced, but even Langford questions whether enough is known about sodium and hypertension to recommend that the general public change its eating habits.



Illustrators Stock

The studies of very low sodium diets were initiated in the first half of this century, before there were antihypertensive drugs. The most famous studies were those of Walter Kempner of Duke University who devised the "rice diet." Patients with severe hypertension flocked to Kempner's "rice houses" where they were given diets consisting solely of rice, fruit, sugar, and vitamin pills. Many patients benefited—their blood pressures went down and related conditions such as congestive heart failure were relieved. But patients hated the salt-free diets, complaining that they lost their appetites and were weak and without energy.

The rice diet was widely touted as proof that sodium causes high blood pressure. But, as Frederic Bartter of the Veterans Administration Hospital in San Antonio points out, the diet had two other things going for it in addition to its low sodium content. It made the patients lose weight and it had a high potassium content (fruits and vegetables are excellent sources of potassium). Weight loss is correlated with reductions in blood pressure and high-potassium diets also seem to be associated with lowered blood pressures. "Kempner's diet is so confounded," Bartter says, "that you can't say its effects are solely due to its low sodium content."

Other often-cited evidence that very low sodium diets affect blood pressure comes from studies of isolated tribes such as the Yanomamo Indians of Brazil, Kung Bushmen of the Kalahari Desert, and tribes living in the Solomon Islands. These people ate virtually no sodium and had almost no cases of hypertension. And, unlike people in industrialized societies, their blood pressures fell rather than went up as they grew older. However, because their lives were different in many ways from those of Americans, it is hard to argue conclusively that the lack of salt in their diets caused their lack of hypertension.

Harriet Dustan of the University of Alabama Medical School, who is a past president of the American Heart Associ-

0036-8075/82/0402-0038$01.00/0

ation and was chairman of a 1978 NIH task force on hypertension, remarks that there are three differences, other than sodium consumption, between primitive and industrialized societies that could spell the difference in the incidence of hypertension. First, she says, "In societies like the United States, people gain weight with age. In primitive societies, they lose weight. Blood pressure and weight are highly correlated—there doesn't need to be another study about that."

The second difference is in the amount of potassium in the diet. "In primitive societies, people eat relatively more potassium than in industrialized societies," Dustan says.

Dustan also remarks that people in primitive societies tend to be physically fit. "We don't know the importance of that observation," she says. But there is one study by Danish researchers that clearly shows a relationship between physical conditioning and hypertension after correcting for other variables such as body weight, Dustan points out. In speculating about why primitive people have less hypertension than Americans, Dustan remarks, "We're talking about a very complex issue."

Page, who studied the Solomon Islanders, argues, however, that because such a large variety of isolated tribes have been examined, it is relatively easy to determine what these people have in common that may prevent them from developing high blood pressure. Of all these people share, says Page, "The strongest correlation is with sodium consumption. Weight comes out as important too but not nearly so much as a lack of sodium in the diet."

The evidence that very high sodium consumption can cause high blood pressure is more tenuous than the evidence on low-sodium diets. In Japan, where people eat two to four times as much sodium as Americans, nearly one-third of the people have hypertension. In this country, about one in six has high blood pressure. The highest incidence of hypertension in the world, nearly 40 percent, is in northern Japan where the people eat about 9 grams of sodium a day. Moreover, Page studied one isolated tribe, the Qash'qai nomads of Iran, who consume about 4 grams of sodium a day and who, Page says, "are riddled with hypertension" even though they are lean and physically fit.

But researchers who tried feeding normal volunteers extremely large amounts of salt have had little success in showing effects on blood pressure. For example, Myron Weinberger, F. C. Luft, and their associates at Indiana University Medical School gave healthy men with normal blood pressures up to 75 grams of salt a day—so much that they had to supply half of it intravenously. At this high dose, the men's systolic and diastolic blood pressures rose about 10 millimeters. The men, however, excreted large amounts of potassium in their urine when they were given this much sodium. When Weinberger and Luft added potassium supplements to the high doses of sodium, the men's blood pressures no longer rose. Luft points out, however, that their study says nothing about chronic high doses of sodium. The men were receiving the large doses of salt for only a few days.

Illustrators Stock

Will a low-salt diet help this man?

It might be expected that if sodium causes high blood pressure, people with hypertension might consume more than the average amount of salt. Michael Alderman of Cornell University Medical School points out, however, that "There is no correlation between sodium consumption and blood pressure levels."

It also has been extremely difficult to demonstrate that if people alter their sodium intake within the normal range—from 2 to 8 grams a day—that their blood pressure is affected. "We are not sure if a moderate restriction in sodium would result in a reduction in blood pressure," says Edward D. Freis of the Veterans Administration Hospital in Washington, D.C. Few studies of the effects of moderate salt restrictions have been done and none were conclusive, he remarks.

Page believes that many of these studies were inconclusive because hypertension is a long-term problem that may have its origins in excess sodium consumption in infancy. "High blood pressure is not something that occurs out of the blue in adult life. In rat models, the younger the animal the more susceptible it is to sodium. The same may be true of humans," he says. "We do need a controlled study," he remarks, but adds that to truly determine whether lowering sodium consumption can reduce the incidence of hypertension would require a clinical trial involving children who would be followed for 15 or 20 years. "The evidence we already have would not justify waiting 15 or 20 years," he says.

Proponents of low- or moderate-sodium diets argue that even if the evidence isn't impeccable, it at least wouldn't hurt to cut out some salt. "I would challenge anyone to show that lowering sodium consumption to 2 grams a day would be harmful," says Page. Stephanie Crocco, food scientist for the AMA, says, "We [the AMA] recommend moderation in all things and we recommend moderation as well in sodium intake." The AMA, she explains, suggests that healthy Americans, even those with no family history of hypertension, aim for diets of about 4 grams of sodium a day—the average sodium consumption. Asked how she justified that recommendation for healthy people, Crocco burst out, "Because I think it [over-salting food] is a lousy habit!"

Langford, who thinks that at least known hypertensives should lower their sodium consumption, says he has some doubts about whether the general public should be advised to do so. He would like to know whether any subgroups of the population would be harmed by low-sodium diets before advising that the general public adopt them.

Dustan goes further. "Why in the name of heaven should we restrict sodium intake of people who are not hypertensive?" she asks. Alderman agrees. "I think it is incumbent on those who want us to change our diets to provide evidence that we should do so," he says.

—GINA KOLATA

Additional Reading

H. P. Dustan, "Salt and hypertension," *Cardiology Update: Reviews for Physicians*, vol. 3, 1982.