

Cigar Smoking: Risky Business

Cigar smoking is neither safer than cigarettes nor a passing fad, according to "Cigars: Health Effects and Trends," a new monograph published by the National Cancer Institute (NCI).

"Physicians have an obligation to correct the impression for their patients that cigar smoking, including that of premium cigars, is safe," said David M. Burns, MD, the monograph's senior scientific editor. "The toxic substances and carcinogens in cigar smoke, like those in cigarette smoke, are associated with increased risk of heart and lung disease."

Consumption of cigars in the United States began to increase in 1993 and almost doubled by 1997, when more than 5 billion cigars were consumed nationwide. Sales of the large cigars that constitute two thirds of the U.S. market rose 18% between 1996 and 1997. Sales of premium cigars—imported and handmade—have increased 250% since 1993. During that time, cigarette consumption decreased by 2%.

Health Risks Significant

The researchers noted that cigar smoking causes serious health risks for daily cigar smokers. Much of the risk relates to the amount of exposure to tobacco smoke (frequency of smoking and pattern of inhalation). Smokers who consume one or more cigars per day and do not inhale have a risk for oral cancer that is 7 times greater than that for nonsmokers; risk for laryngeal cancer is 10 times greater. When people smoke five or more cigars per day with at least moderate inhalation, their risk for lung cancer is similar to that for people who smoke a pack of cigarettes per day. Regular cigar smokers who inhale and smoke more than three cigars per day also have an increased risk for coronary

heart disease and chronic obstructive pulmonary disease. Risks for oral, laryngeal, and esophageal cancer are similar to those for cigarette smokers. Data also suggest that cigar smokers may be at higher risk for aortic aneurysm and that cigar smoking may be associated with cancer of the pancreas. Mortality risks were highest for cancer of the larynx.

Tobacco smoke contains more than 4000 compounds—including toxic agents and carcinogens—but these compounds are present in different amounts in cigarettes and cigars. For example, a large cigar emits up to 20 times more ammonia, up to 10 times more cadmium, and up to 90 times more tobacco-specific carcinogenic nitrosamines than a cigarette does. Although cigars generate slightly smaller amounts of suspended particulate matter than cigarettes, they also generate larger amounts of carbon monoxide. In addition, bioassays in animals show that tar in cigar smoke is more carcinogenic than that in cigarette smoke.

The large amounts of these substances emitted by cigars also create concern about second-hand cigar smoke. Carbon monoxide levels at indoor cigar events have been found to be similar to those of a crowded Los Angeles freeway. Smoke from a single cigar burned at home can expose nonsmokers to a health risk for as long as 5 hours because of lingering smoke.

Changed Smoker Profile

Cigar smokers are no longer the prototypical older man. By using limited national data and data from California, the NCI researchers found that men who were 18 to 44 years of age showed the greatest increase in cigar smoking. Much of the increase was in white men with above-average income and education, which is opposite from the pattern for cigarette use. Both former cigarette smokers and never smokers (includ-

ing women) are now smoking cigars. Three fourths of cigar smokers smoke occasionally, and some consume only a few cigars annually. Most cigar smokers do not inhale, possibly because the amount of free nicotine is higher in cigars than in cigarettes and nicotine is readily absorbed through the oral mucosa. Former cigarette smokers and smokers who consume both cigarettes and cigars are of particular concern. They are more likely to inhale and thereby place themselves at greater risk for major smoking-related diseases.

Cigar smoking is also increasing among adolescents, probably as a result of celebrity endorsement and image-related marketing. The use of sex and celebrity to sell cigarettes is prohibited by the tobacco industry's voluntary code, but no such obstacle exists for cigars: Athletes and Hollywood celebrities of both sexes promote cigar smoking. The young are clearly being influenced. One study of students in a Massachusetts school showed that 3.2% of male students smoked cigars in sixth grade and 3% smoked them in high school. Up to 7% of adolescent girls reported that they had smoked cigars. Cigar use by adolescent males now exceeds the use of smokeless tobacco. "We do not know if cigar smoking is addictive," said Burns, "however, addiction studies of cigarettes and smokeless tobacco show nicotine addiction occurs during early years." The researchers noted that current patterns of cigar use by young people may be similar to the consumption of smokeless tobacco, particularly moist snuff.

For patients who smoke cigars, the researchers concluded, quitting is the only way to avoid the documented health risks that accompany cigar smoking.

—Christine Kuehn Kelly

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Mortality Trends Tell Us How We're Doing

The emerging data from mortality studies of the major illnesses of U.S. adults are a sensitive gauge of our medical and public health system's progress against disease. Through statistical analysis of death certificates, epidemiologists have credited the U.S. health care system with an overall reduction in death rates and an increase in life expectancy. In 1996, the nationwide age-adjusted mortality rate reached an all-time low, and the average life expectancy reached an all-time high of 76.1 years.

In individual areas of pathology, however, survival performances vary. Cardiovascular mortality numbers show progressive annual improvement, and clinicians and researchers have recently enjoyed impressive success against cancer and HIV infection, with corresponding decreases in death rates. But although researchers have applied new management approaches to the growing population of diabetic patients, these have not yet resulted in similar decreases in the death rate from diabetes and its complications. In fact, the diabetes-related death rate is on a 10-year upswing.

Leading Causes of Death

Eight of the top-10 causes of death are ailments that are primarily managed by internists. Heart disease, cancer, stroke, and chronic lung disease make up the top four; diabetes, HIV, liver disease, pneumonia plus influenza, accidents, and suicide round out the top 10. The eight conditions that internists encounter were responsible for 1.75 million deaths in 1996.

The causes of death in various adult age ranges differ. For young adults 25 to 44 years of age, HIV is the number-two killer; accidents are number one. In adults 45 to 64 years of age, cancer is the most common lethal illness; in persons older than

65 years of age, heart disease is more prevalent. These annual figures are taken from death certificates in every state and standardized to an age distribution of a specific year to produce age-adjusted death rates for each of the leading causes of death. Unfortunately, however, many death certificates are inaccurate (see News Note).

Mortality Atlas

Last year, the federal government published a mortality atlas for the first time. The atlas illustrates how death rates vary geographically, and it identifies areas that have high concentrations of the diseases internists see most. According to figures from the Centers for Disease Control and Prevention, Hawaii has the lowest age-adjusted death rate and the District of Columbia has the highest.

The atlas directs internists' attention to the southern United States, where a relatively larger proportion of the mortality burden can be found. The southeastern United States is now the "hot spot" of cardiovascular disease because mortality rates in the northeastern region have decreased faster than they have elsewhere. Lung cancer mortality among African-American men is concentrated in urban areas and in the southeastern United States; among white men, it is heaviest in the Mississippi and Ohio river valleys and along the southern Atlantic coast. The atlas also shows that HIV mortality is concentrated on the east and west coasts and in all urban areas.

Epidemiologists in government and academia are encouraged by the insights provided by the aggregate data that allow them to pinpoint specific populations of patients at particular risk. The rates of change in individual disease categories from one year to the next are small. However, they have a large impact on the population's health because of the "multiplier" effect of the large U.S. population. "In chronic diseases, a 1% per-year change in the age-adjusted death rate is a massive change," explained Philip Cole, MD, professor of epidemiology at the University of

Alabama at Birmingham. Between 1995 and 1996, the age-adjusted death rates for heart disease, cancer, and liver disease decreased approximately 3%, 1%, and 1.5%, respectively. For HIV, a staggering 26% decrease in deaths was registered during these 2 years. But for diabetes, the age-adjusted death rate rose 2.3% during the same period.

Prevention vs. Treatment

Subspecialists and epidemiologists acknowledge that a combination of improvements in health screening and prevention and advances in therapies and technology are the keys to understanding the improvements in mortality. However, whether prevention or treatment is primarily responsible for the progress is a matter of debate. Heart disease, which is the nation's leading killer, has been fought comprehensively on many levels.

"Cardiology is much more aggressive today," commented Pawap Sharma, MD, of the University of Utah in Salt Lake City. "Until the 1970s, patients with myocardial infarction [MI] were treated with bed rest." Sharma enumerated several key initiatives by cardiology, including the creation of cardiac care units, cardiac rehabilitation, and increased public awareness of the dangers of smoking and cholesterol.

Over the past three decades, mortality has fallen at a rate of 2% to 4% annually. One group of researchers used a computer model to rank the relative importance of the factors responsible for the decline in cardiac mortality from 1980 to 1990. They found that about 50% of the decrease could be attributed to risk factor reduction in the form of primary and secondary prevention. They also illustrated the benefits of focusing efforts on persons with known heart disease; the computer model indicated that 70% of the decline in mortality was explained by better treatments and prevention of adverse events in patients already diagnosed with heart disease (*JAMA*. 1997;277:535-41).

In addition to collecting large aggregates of data that document the

importance of primary and secondary prevention of MI through risk factor modification, cardiologists have sought new technologies and adjunct medications that have enhanced the safety and long-term efficacy of technical procedures, such as coronary angioplasty. "Thirty years ago, we didn't have the techniques and the medicines that we have today," Sharma noted. "Restenosis has gone down because of stents, and medicines like abciximab have improved the long-term success of stents."

AIDS Deaths

Although improvements in cardiology have been gradual, advances in the treatment of HIV infection have been more sudden, and the mortality data show that these advances have had a tremendous effect. A recent study of 1200 HIV-positive patients documented a sharp decrease in mortality in 1996 and 1997 that correlated with the introduction of aggressive antiretroviral therapy (*N Engl J Med*. 1998;338:853-60).

"A combination of things is responsible," stated Anthony Fauci, MD, director of the National Institute of Allergy and Infectious Disease. "The early part of the trend was caused by the introduction of more effective therapy that consisted of combinations of nonnucleoside analogues. That added to the benefit from ongoing efforts at education, aggressive diagnosis, treatment, and prophylaxis of opportunistic diseases." Fauci added that the success of protease inhibitors has contributed to the improving mortality trend in HIV. "And the expansion of ADAP [AIDS Drug Assistance Program] has allowed more people to get access to these drugs."

Few experts expect the AIDS death rate to continue to plunge, and some worry that the treatments that are being developed could lead to disregard for safer sex guidelines and to relaxation of efforts to reduce the use of contaminated needles by injection drug users. Many researchers are also extremely concerned that HIV might become resistant to current therapies.

"The downward trend should continue but might level off if people become refractory to therapy," Fauci added. For AIDS mortality to continue to decrease, internists will have to teach behavior modification to those at risk, guard against opportunistic infections in those who are infected with HIV, and push combination therapy with antiretroviral agents as specified in the Center for Disease Control guidelines, according to Fauci. "People need to be on aggressive triple-drug therapy," he asserted.

The explosion of new HIV drugs and therapeutic options presents an information challenge to internists, who need to keep up to date to deliver the best care to their HIV-infected patients. "While it's not appropriate to say that every patient with HIV needs to be taken care of by an ID specialist," commented Fauci, "a general internist should at least intermittently consult with an ID specialist."

Reversal in Cancer Death Trend

Explaining why mortality rates decrease in diseases like cancer and AIDS is important because health policy planners use mortality data as evidence to lobby for funding of strategies that are aimed at either prevention or therapy. Oncology is an example. The much-publicized "war against cancer" was a disappointment in the context of mortality numbers because age-adjusted death rates for cancer climbed annually for many years. Since 1991, however, the age-adjusted death rate has decreased slightly each year. Researchers then debated where to place the credit for the lives saved.

The cancer literature has outlined a disagreement between two groups of epidemiologists. One group argues that resources should be allocated for prevention efforts, and another group advocates investment in treatment-focused research. "What caused controversy was our analysis," stated Heather Gornick, MD, MPH, of Brigham and Women's Hospital in Boston. "Prevention and changes in cancer incidence are what are driving the decrease in cancer deaths," she

added. "The overall decline in cancer mortality is highly correlated to the decline in lung cancer mortality, which is primarily reflective of changes in tobacco consumption. These data provide emphasis for how the cancer control program of this country should be run. I think these data endorse prevention."

Cole, however, fears that the data do not support the conclusion that prevention is solely responsible. He feels that the war against cancer is being won on two fronts. "I will contend that it's about 60% prevention and 40% from medical care," he stated.

Mortality Rate Interpretation

The preliminary data for 1997 show that 1997 will be the first year in history where the number of deaths from cancer has actually declined. "Cancer is the great epidemic of the 20th century, and that epidemic is on the wane. You don't have to be a statistician to appreciate this," noted Cole.

The intricacies of interpreting mortality data and the fallibility of those data are perhaps best demonstrated by diabetes. Genetic and environmental factors have created an epidemic of diabetes in African-American and Hispanic populations, and an increase in diabetes-related mortality has been documented by the National Center for Health Statistics. But diabetes may be a condition that is difficult to study accurately with current statistical methods. "Death certificate data are a fairly problematic source to my way of thinking," stated Maureen Harris, PhD, MPH, director of the National Diabetes Data Group at the National Institutes of Health. From year to year, deaths from diabetes can be either greatly overestimated or underestimated because the reporting of underlying causes of death on death certificates varies, according to Harris.

NHANES Results on Diabetes

Harris believes that cohort studies, such as the National Health and Nutrition Examination Survey

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(NHANES), will provide more accurate results. Harris has compared nationwide mortality rates of diabetic adults to those of nondiabetic adults. The results show the diabetic patients' survival disadvantage. "We're finding a much smaller mortality decline in diabetics than in nondiabetics in both cardiovascular mortality and in all-cause mortality," she asserted.

Data from the NHANES survey may help internists focus on the diabetic patients who are at highest risk. "The excess risk seems to occur in clinically overt diabetics. . . about 70% of the diabetic cohort's death was cardiovascular compared to 40% of the nondiabetic cohort," added Harris.

It will probably take years before such innovations as fast-acting insulin, newer oral agents, and the effects of improved diet and increased exercise affect diabetes mortality data. Kenneth Polonsky, MD, professor of medicine and chief of endocrinology at the University of Chicago, is among the many internists who are working to reverse the mortality trend in diabetes. He underscored the need to target African-American and Hispanic populations and expressed hope that assays for serum biochemical markers, such as plasminogen activator inhibitor I, might someday give internists early warning of patients who are predisposed to diabetes and its macrovascular complications.

"For now, preventive measures are general," he stated. "Internists need to be able to identify the so-called syndrome-X phenotype, which includes obese, sedentary persons with a family history of diabetes or women with a history of gestational diabetes. Those are the people at risk. They should be counseled with diet and exercise now while other preventive measures are being studied." In known diabetic patients, he added, clinicians should treat hyperlipidemia, screen for diabetic nephropathy, and refer any patient who cannot achieve a total glycosylated hemoglobin level of 8 or less to an endocrinologist. "It's not an easy disease to take care of," Polonsky

conceded, "because available oral agents do not work well, and most become ineffective over time."

The Broad View

Epidemiologists also hope that their mortality data will provide a population-sized context in which clinicians can shape their priorities. "It's important to place your patients

in a national context," encouraged Gornick. "In medical school, we learn a lot of fantastic molecular science but we don't learn enough population science, which is just as rigorous. Medicine has a greater social purpose, and it's through these data that we understand it."

—Paul T. Kefalides, MD

News Note

Death Certificates

Death certificates provide crucial information for many purposes, from the settlement of insurance claims and legal cases to detection of epidemiologic trends and allocation of health care and research resources. Accurate reporting of the cause of death is thus extremely important.

However, studies suggest that death certificates are often inaccurate. In one study, only about 56% of medical students and residents and 57% of practicing general internists were able to state the correct cause of death for the six case studies provided (*JAMA*. 1996;275:794-6). The cause-of-death section of the certificate has three main parts: the chain of causation from immediate to underlying causes, the interval between onset of each of these conditions and death, and other contributing conditions unrelated to the underlying cause. Listing mechanisms rather than causes of death was the most common cause-of-death entry error found in 384 death certificates reviewed at a university hospital (*Postgrad Med*. 1987; 81:245-7).

In another study, researchers compared 272 randomly selected autopsy reports with the corresponding death certificates (*N Engl J Med*. 1985;313:1263-9). In 29% of the deaths, the listed underlying cause differed between the two sources to such an extent that the deaths were reclassified in different major disease categories (as defined by the International Classification of Diseases) on the basis of the autopsy data. In 26% of the deaths, the death certificate and the autopsy report each listed the same major disease categories but attributed the deaths differently.

According to Brian C. McGrane, MD, and colleagues, many errors in death certification are created by confusion between immediate and underlying causes of death or between "cause" and "manner" of death (*Am Fam Physician*. 1997;56:1433-8). The underlying cause, which usually provides the most important epidemiologic information, may predate the immediate cause by several years. For example, acute myocardial infarction (the immediate cause) is produced by arteriosclerotic heart disease (the underlying cause). Accident, suicide, and homicide are immediate, not underlying, causes of death.

Most states do not require physicians to have formal training in certifying death. McGrane and colleagues suggest that more residency training in this area would be beneficial, as would the inclusion of death certification procedures in morbidity and mortality conferences.

In an editorial that accompanied McGrane and colleagues' study, Grace Brooke Huffman, MD, wrote, "In much the same way that an autopsy can contribute to the body of medical knowledge, thoughtful, careful, and accurate completion of the death certificate can allow every patient's death to have far-reaching consequences."