Lieberman went on to mention that he felt that adequate assay procedures are currently available for undertaking large scale screening programs. He described the method being used in his laboratory employing crystalline trypsin and BAEE substrate and showed how this method could be used for rapid screening. He does not think that radial immunodiffusion is as dependable or useful. Lieberman described his studies showing that false positive tests for antitrypsin deficiency do not result from any other disease including nephrosis and cirrhosis. He also described the use of diethylstilbestrol as a provocative test for detecting heterozygotes when the antitrypsin level has risen into the low normal range in response to acute illness. A history of contraceptive medication must be obtained from women in population surveys, since heterozygotes may have low normal values when receiving estrogenic medication.

Lieberman then discussed the current theory regarding the role of α1-antitrypsin in protecting the lung from the digestive enzymes in leukocytes and macrophages and the results of his studies confirming this theory. Finally, he raised questions pertaining to the possibility that all antitrypsin deficient subjects may not be of the same genetic molecular type, and that other molecular variants may predispose to lung disease. He asked if other genetic variants have a reduced ability to develop increased antitrypsin levels in response to stress or estrogens. Is the ability to increase antitrypsin activity more important for preventing lung disease than the basic level of antitrypsin activity?

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SESSION V. EPIDEMIOLOGY AND PSYCHOLOGY OF CIGARETTE SMOKING

Epidemiology and Psychology of Cigarette Smoking

Daniel Horn, Ph.D.

Recent experience in the United States has shown that it is possible to reduce cigarette smoking substantially. Figure 1 shows the per capita consumption of cigarettes from 1947 to 1969. The rise after the Second World War in the years 1947-52 resulted largely from an increase in smoking by women. The drop in 1953 was probably due to the first widespread appearance in the press of reports based on the retrospective studies published in 1950 linking smoking with lung cancer. The drop in 1954 reflected the effect of the report by Hammond and Horn on the first large-scale prospective study to present results showing the effect of cigarette smoking on total death rates and including data on the relationship of smoking with ischemic heart disease and respiratory diseases other than lung cancer. Subsequent studies have suggested that the 1953-54 reduction in cigarette smoking was largely confined to men with a university education. Recovery from the low consumption rates of 1954 was slow at first, but then accelerated, passing the previous peak consumption by 1958.

Occasional reports of scientific studies on the subject appeared to have had little effect until 1962 (when the Report of the Royal College of Physicians was followed by a plateau in the curve) and 1964 (when the Report of the Advisory Committee to the Surgeon General was released). This report was given wide publicity on television and radio, as well as in the press, and was responsible for a large immediate drop in consumption. The consumption began to rise again in about six months, and almost reached the high per capita levels immediately preceding the appearance of the report. This was followed by a period of about two years during which there was little change in the per capita consumption. This plateau masked the fact that large numbers of adults had successfully stopped smoking, the increases being largely due to increased smoking by successive cohorts of women—about balancing the effect of smokers stopping. Consumption then began to drop, probably in the early part of the second half of 1967, and has now continued to drop at what appears to be an accelerating rate for about two and a half years. The total consumption of cigarettes in the United States of America dropped from 75.2 million packets a day in 1967 to 74.5 million in 1968, then to approximately 72.5 million in 1969, despite a population increase of about three million persons per year (including about two million adults). The per capita consumption of cigarettes corresponding to this dropped from 11.73 per day per person aged 18 years and over in 1967 to 11.44 in 1968 and approximately 10.94 in 1969. The consumption in 1969 represents a 3.7 percent drop from the previous highest total consumption and a 7.8 percent drop in per capita consumption from the highest level reached after the appearance of the 1964 report.

An extensive prospective epidemiologic study in behavioral change is now nearing completion in a representative sample of smokers in the United States. It is expected that it will identify the characteristics distinguishing those who have tried to stop smoking from those who have not tried and, among those who have tried, those who have been successful and those who have not. This analysis may provide a better understanding of changes in behavior in relation to cigarette smoking. The magnitude of the changes that have already occurred is indicated by the estimate that, of the 50 million adults in the United States of America who were regular cigarette smokers in 1966, about seven or eight million have successfully stopped smoking.
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FIGURE 1. Trends of cigarette consumption per person (age 18 years and over) per day in the USA. The figures of per capita consumption are the averages computed over the 12-month period ending on the specified date. In the graph, each point was plotted at the mid-point of the 12-month period. Thus, the value 9.81 for the 12-month period ending 31 December 1950 was plotted against the mid-point (30 June) of 1950, and the value 10.09 for the period ending 30 April 1951 was plotted against 31 October 1950.

It is difficult to be certain of the reasons for this reduction in smoking. Studies in 1964 and in 1966 indicated a high proportion of smokers with attitudes that showed a basic readiness for change, yet the change did not start taking place to any large extent until the second half of 1967. During the late spring and the summer of 1967, the press reported extensively on a number of scientific reports on cigarette smoking and on various political and control activities in relation to it. A government decision about that time made it possible to develop short films for television (usually varying from 20 seconds to one minute in length) on the health effects of cigarette smoking. However, although the decline in smoking has sometimes been ascribed to the wide use of these television films, the decline in smoking began before they came in to any considerable degree. It therefore seems more likely that the television films have helped to reinforce and continue a trend that began as a result of other influences. It is probable that, after several years in which public awareness and acceptance of the evidence developed, the effects of a widespread national program attempting to be active under all six of the general headings listed above began to be felt. Although the decision to stop smoking is a personal one, once enough people begin to stop, the impact on their friends and acquaintances helps develop a climate in which it becomes easier for others to stop. This would account for the apparent acceleration in the rate of giving up smoking and suggests that once the process begins it can be increasingly successful. If this is so, the prospect of bringing cigarette smoking under control is bright.

For a public health activity to succeed, there must be both an effective program and an organizational structure to carry it out. In the United States the organizational structure that has been developed consists of two independent but closely coordinated bodies: the National Clearinghouse for Smoking and Health, a unit working within the United States Public Health Service, and the National Interagency Council on Smoking and Health, a loosely knit association of about 30 agencies within the country which coordinates the work of its member agencies, exchanges information on programs, and ensures concerted action when needed. The Council includes among its members professional associations of health workers, voluntary health organizations, educational professional associations, government agencies, and service associations. It provides a means of increasing the effectiveness of the many agencies that are to some extent concerned with the problem of smoking but only as one problem out of many. The Clearinghouse devotes its entire time to dealing with the problem of smoking in all its aspects. It is doubtful whether an effective program could have been developed without both of these bodies.

Discussion

In answer to questions, Horn stated that men college graduates had the highest rate of quitting smoking since the general public first became aware of the health problems of smoking. The largest recorded drop in cigarette consumption took place in 1954 immediately after the Hammond-Horn report. By 1958 cigarette consumption had regained its previous per-capita peak. At present, consumption is back down to the level at 1958.

Ishikawa asked about U.S. vs U.K. Orn's answer was that tobacco consumed in the U.K. was down along with smaller reductions in the proportion of smokers. The
amount of tobacco consumed per person in the U.K. has decreased because of the popularity of filter cigarettes. In 1962, the Royal College of Physicians’ report was followed by a plateau in U.S. consumption. After the Surgeon General’s report in 1964, in addition to complete cessation by many millions of smokers, there was a marked switch in brands, as well as many other kinds of changes. For the first time, a decrease in consumption took place among the blue collar workers. Consumption began to rise again after a few months and within a year almost reached the previous peak; this was followed by a period of about two to two and one-half years at a plateau. Decrease in smoking by adults was about matched by the increase due to young cohorts entering adulthood at higher rates of smoking than their parents or grandparents. Consumption began to drop once more in 1967 and continues to drop at what appears to be an accelerating rate: 75.2 million packs per day in 1967, 74.5 in 1968 and 72.5 in 1969, despite an increase in population of 2.5 million per year. This represents a 3.7 percent drop in total consumption and a 7.8 percent drop in per capita consumption from the highest level reached after the 1964 report. A current prospective epidemiologic study is being conducted comparing those who have succeeded in stopping smoking with those who have not. Of the total of 50 million adult cigarette smokers in 1966, at least seven or eight million have probably quit. The decrease may be partially due to extensive reporting by the press of the adverse health effects of cigarette smoking and of the political actions taken to deal with the problem. Also anti-smoking radio and TV spots are felt by many to be largely responsible for the reduction. Horn, however, did not believe that the anti-smoking announcements started the reduction, but rather contributed to its continuation and reinforcement, because the reduction started before the anti-smoking commercials were widely used.

In 1962, 20 percent of smokers said they had talked to a physician about smoking, in 1964 it was up to 27 percent, and in 1966 it was up to 37 percent of cigarette smokers. Smoking, first among physicians, then in the rest of the population, has become less acceptable socially. About 4 percent of American men still chew tobacco.

Peabody stated that the firemen in his nine-year study have either quit or markedly reduced the amount consumed. Ten years ago 70 percent of men smoked cigarettes and now only 30 percent are cigarette smokers. Horn commented that as one gets older smoking becomes less attractive. When will the changes in smoking habits that are currently going on begin to affect mortality data? What can be done to help people stop? Clinics seem to be getting much better results than they did a few years ago, according to Horn. This could result from an increased feeling of social support for non-smoking. Slonim, Denver, commented that most people who go to clinics are ready to quit.

Horn would like to put smokers through a process that will teach them a great deal about smoking, such as why you smoke, etc. Smoking consumption is higher in servicemen than in the rest of the U.S., and higher in enlisted men than in officers. Horn feels that there are a number of types of smokers, but most of the problems occur in two types: those who find it hard to quit, but easy to stay off; and those who find it easy to quit, but hard to stay off.

Goldsmith stated that cigarette smokers should pay more for health and accident insurance and should be excluded from certain types of jobs. Some insurance programs give reduced rates for non-drinkers.

Macklem commented that smoking is an addiction and must be attacked like any other addiction.

Snuff and chewing tobacco consumption have stayed fairly stable, according to Horn.

The fear that a major change in smoking habits might affect the economy is false: the $5 billion tobacco industry would be lost, but would be replaced by something else, according to Newhouse.

Peabody felt that smoking education programs in San Diego schools have been very helpful. Ferris commented that teaching that emphysema will develop in smokers is of little benefit in teenagers. It is much more important to show them that smoking will adversely affect them within a few years. Marijuana bronchitis was then discussed. In talking with young people, we must talk about the whole environment, including marijuana, air pollution and drugs, according to Horn.

Peabody has noticed a 10 percent increase in non-smokers in the three-year period just past. One-third of all patients will stop when advised to do so by a physician; an additional third will eventually stop at the physician’s suggestion or for other reasons; and one-third will probably never stop.

Ferris urged the enlistment of disc jockeys in the anti-smoking campaign. Cancer fear is ineffective. Many patients have never been advised by their doctor to give up smoking.

Goldsmith commented that we ought to be getting close to the point where we can identify those who can and cannot tolerate smoking. We should be interested in the development of a harmless cigarette. Horn estimated that the PHS is interested in this.

The most important element in cigarette smoking control is the physician’s office, according to Horn, but there are not enough doctors doing the job. Twenty-five percent of regular cigarette smokers are psychologically addicted.

Slonim asked whether there are not a few people who are, everything else considered, better off not trying to quit. Peabody answered that there are certainly some people who are better off not quitting. Horn estimated that no more than 10 or 15 percent of smokers fall into this category and wondered if they can be identified.

According to Slonim, self-destruction plays a large role in human experience. Smoking is, among other things, a form of self-destruction, as well as defiance of authority. Failure to understand and accept these facts is part of the smoking problem. Horn disagreed that these are major considerations; the use of cigarettes for self-destruction is too time consuming, and too unspectacular for most people to choose as a way of death.