

SMOKING AND DISEASE

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Historical

It all started in America, and long before the arrival of Columbus — but then the Red Indians smoked a pipe. The European villain of the piece is said to have been Sir Walter Raleigh, though some say that tobacco-smoking was introduced in Europe by Bristol seamen when Sir Walter was still in his boyhood.

However, smoking was not unknown in Europe before the 16th century; Roman remains in Great Britain and Ireland suggest that hemp and aromatic herbs had already been smoked in pipes. During the last War, at least in Malta, the wheel had turned full-circle; because of the shortage of tobacco due to the siege enterprising “addicts” started smoking dried fig, vine and lemon leaves as well. After the second World War, a worldwide rise in the consumption of tobacco occurred, largely due to an increase in smoking by women.

The first inkling that tobacco was definitely harmful to health came from two American retrospective surveys published in 1950 (1, 2, 3, 4), but it was only in 1953 that these reports received widespread

publicity in the Press and the general public was at last made aware that there might be a relation between smoking and disease.

The next important step was a large scale prospective study by Hammond and Horn published in the J.A.M.A. of 7th Aug. 1954 (5). This report showed the effect of cigarette smoking on total death rates, and it included data on the relationship of smoking to ischaemic heart disease and to respiratory conditions other than lung cancer. Subsequent studies showed that these reports had very little effect on the smoking habits of the general population; if there was any reduction of smoking at all, it was largely confined to men with a university education (6, 7).

Many scientific studies on the subject then appeared, but it was not before 1962 (Report of the Royal College of Physicians) and again in 1964 (Report of the Advisory Committee to the Surgeon General) (8, 9) that a definite forward step was taken to give wide publicity on television and radio and in the press, to the harmful effects to health of tobacco smoking and especially of its inhalation.

Most (?) British doctors had stopped smoking for some time ⁽¹⁰⁾, but for the first time ever the layman had started to take notice. Figures show that, at least in the U.S.A., the total consumption of cigarettes dropped from 75.2 million packets (of twenty) 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 ⁽¹¹⁾.

However, in 1969 the FAO reviewing the world tobacco economy from 1955 to 1967 reported that "..... the outlook is that tobacco consumption will grow further in developed, developing and centrally planned countries. In the past decade the most remarkable feature of tobacco consumption has been the trend towards cigarettes. The manufacture of cigarettes expanded by one half in developing and centrally planned countries and by 40 per cent in developed countries....." ⁽¹²⁾. It appeared that some persons might have stopped smoking, but, if so, those who had not done so must have increased their daily quota of cigarettes.

At its forty-fifth Session held in Geneva in January, 1970, the World Health Organization stated through its Executive Board that "no organization devoted to the promotion of health can be neutral in the matter of cigarette smoking" and "requested the Director-General to report to the Twenty-third World Health Assembly on measures that might be taken to affirm the hazards of smoking". This led to a comprehensive report on "Smoking and Health" ⁽¹¹⁾, written jointly by Drs. C. M. Fletcher, of London, and D. Horn, of U.S.A., WHO consultants, who reviewed the whole problem suggesting ways and means of "reaching" the public.

In August of this year, at the XI International Congress on Diseases of the Chest, held in Lausanne, Switzerland, no less than two major Symposia occupying two half-days were devoted to smoking problems (office management, biological effects) and to cancer of the lung (epidemiology, case finding, clinical varieties).

Finally, at the Twentieth Session of the WHO Regional Committee for Europe, which was held in Malta during the end

of September, 1970, measures for the control of smoking were fully discussed. It was disclosed that the Government of Malta had decided to take statutory and educational measures for the control of smoking.

Hazards of smoking

Comparative mortality. Comparative mortality studies of smokers and non-smokers showed that:

1. Cigarette smokers, taken as a whole, have approximately 30-80% greater mortality than non-smokers ^(10, 13);
2. The mortality is greater in cigarette smokers who inhale than in those who do not ^(10, 13);
3. Smokers of pipes and cigars, taken as a whole, have little or no excess
4. Pipe or other smokers *who smoke heavily or inhale* have mortality rates that mortality compared with non-smokers; are 20-40% greater than those of non-smokers ^(13, 14);
5. Excess mortality increases with the number of cigarettes consumed (*or more correctly with the amount of tobacco smoke inhaled*) and the length of the smoking history.

Smoking and Disease. It is to be expected that of the excess mortality in smokers 80% would be due to diseases of the respiratory tract, i.e. lung cancer, bronchitis, emphysema. Other conditions in which consumption of tobacco has been proved as a provoking or an etiological agent include ischaemic heart disease and other conditions of the vascular system, peptic ulcer, and cancer of the oral cavity, larynx, oesophagus and bladder. It is also being said that cancer of the breast may be more common in wives whose husbands are smokers; this is hard to prove as control trials would create obvious difficulties.

Those who are interested in smoking, financially or otherwise, have brought forward the theory that the urge to smoke and the predisposition to certain diseases are both genetically determined and both combine to produce the diseased state. Proof of this concept is far from convincing.

On the other hand, Fletcher and Horn ⁽¹¹⁾ have stated that smoking has to be accepted as responsible for the increase in incidence or in the severity of a disease if:

- a) the incidence of the disease is quantitatively related to the exposure to cigarette smoke;
- b) the incidence decreases in those who stop smoking;
- c) a mechanism can be postulated by which the disease could be produced or exacerbated by smoking; and
- d) the disease can be produced in animals by exposure to cigarette smoke or to its components.

Retrospective and prospective studies from Canada, the United Kingdom and the U.S.A. ^(12, 13, 14, 9) as well as from several other countries ^(9, 15, 16, 17) have shown that the above requisites have been amply fulfilled.

Pulmonary diseases related to smoking

Bronchitis. Some degree of impairment of pulmonary function is invariably present in *all smokers* ^(9, 18, 19) and 30% of *heavy smokers* (more than 15 cigarettes a day) develop chronic bronchitis ⁽¹⁸⁾.

The main abnormalities consist of progressive narrowing of the pulmonary airways and impairment of gas transfer, with consequent hypoxaemia ⁽²⁰⁾ and recurrent bronchial infections. This is due to the many irritants in tobacco smoke causing broncho-constriction and hypertrophy of the mucous glands and paralysing the action of the cilia lining the bronchi; in fact, intensification of cough and sputum shortly after stopping smoking may result from the reactivation of the mucociliary mechanism ⁽²¹⁾.

When "young" smokers stop smoking early enough, the lung function will usually return to normal, but when bronchitis is advanced and emphysema is established, the lung changes are irreversible.

The above changes have not only been observed postmortem in smokers, but have also been demonstrated in the lungs of rats who are regularly exposed experimentally to inhalation of tobacco smoke ⁽²²⁾.

Lung Cancer. Retrospective and prospective surveys have proved convincingly that the effect of tobacco smoking, and this includes cigar and pipe smoking as well, depends only on whether smoke is inhaled or not ^(23, 24), are definitely related to the risk of developing a certain type of cancer of the lung, with the risk increasing with the amount of tobacco consumed.

Granted that in some types of lung cancer other factors, such as predisposition, air pollution, industrial hazards as well as geography have to be taken into consideration, one can say that, other than in the case of adeno-carcinoma, lung cancer is self-produced, i.e. by smoking.

Statistics from several countries have shown an increase in the incidence and mortality rates of cancer of the lung during recent decades. In Malta, where very few women smoke, and most men do and where industrialization is still in its infancy the number of men reported as having cancer of the lung in 1969 was more than double that of 1952 (when all forms of cancer became notifiable by legislation), i.e. 1952, 23 new cases; 1969, 56 new cases but during the same period there has not been any change in incidence in the case of women, i.e. 1952, 6; 1969, 4. Again, in 1969 the mortality from cancer of the lung was the highest of all deaths due to cancer — 75 (66 men and 9 women) out of 368 cancer deaths. This, coupled with the fact that cancer of the lung has increased in frequency in both sexes in countries where women smoke ⁽¹³⁾, may be taken as further evidence of the relation between smoking and lung cancer.

Postmortem studies have shown that the bronchi of cigarette smokers show extensive metaplastic changes which could be precancerous⁽⁹⁾. These metaplastic cells are particularly extensive when lung cancer is present while they tend to degenerate in ex-smokers, which might indicate regression of pre-cancerous changes ⁽¹¹⁾.

Experimental evidence is not lacking. That cancer of the skin can be readily induced in animals by the local application of condensates from tobacco smoke (cigarette, cigar, pipe) has been known for some time. Quite recently, squamous cell carci-

noma of the lung has been induced in dogs by making them smoke through a tracheostomy tube ⁽¹¹⁾.

As yet not all the substances that are of prime importance in the production of cancer have been identified; nevertheless, it is well known that benzo-pyrene is a cancer "initiator" and that it occurs in the highest concentration in tobacco smoke.

The effect of cigarette smoking on *pulmonary tuberculosis* is not clear. It is a fact that in spite of widespread increase of smoking in highly developed countries the incidence and mortality from pulmonary tuberculosis have been rapidly declining.

On the other hand, cigarette, pipe and cigar smokers have a four-fold higher risk of dying from cancer of the *mouth, larynx, and oesophagus* than non-smokers ⁽¹⁹⁾.

Other diseases related to smoking

The evidence that smoking is a contributory cause to *diseases of the arteries* is not so strong as in the case of pulmonary diseases. Nicotine is the provoking agent and absorption takes place through all the mucous membranes and inhalation is not necessary for the production of adverse effects on the circulatory system.

It is doubtful whether smoking can cause *peptic ulcer*, but it certainly causes pain in ulcer patients and delays healing of the ulcer.

The relation between cancer of the *bladder* and smoking has been proved. Recently, independent studies have shown that smoking during *pregnancy* is detrimental to the foetus: newborn babies weigh less and the risk of abortion, still-birth and peri-natal mortality is increased two-fold ⁽²⁵⁾.

Actions and reactions

What has been done in the face of all the evidence?

The tobacco manufacturers are doing their level best to advertise and to promote their wares by coupling cigarette smoking with all that is healthful and desirable in life, i.e. outdoor life, all kind of

sports, the female form, etc. To the critics they reply that their aim is not to seduce non-smokers but to try to induce smokers to change over to the particular brand advertised.

Most countries have already abandoned their neutrality and have risen to the responsibilities by banning the advertising of cigarettes on television and radio in various ways:

a) *Complete ban*: Czechoslovakia, Italy, Switzerland, France, United Kingdom, U.S.A. (as from 2nd January, 1971), Denmark, Norway, Sweden, Australia and Canada (Canadian Broadcasting Corporation Network, several independent stations).

b) *Partial ban*: Canada, Federal Republic of Germany, Finland (complete ban by the end of 1970).

c) *Phased elimination*: Ireland (complete ban by March, 1972), Argentina (also in cinemas) for a one year period.

In Malta, on the 23rd of October, 1970, in the House of Representatives, Dr. A. Cachia Zammit, Minister for Health, moved the first reading of a Bill to control the advertising of tobacco; the Bill was given a second reading on the 27th of the same month.

Meanwhile, the confirmed smoker, and therefore the one most at risk, is puffing away to his heart's content..... or discontent.

Preventive measures

Fletcher and Horn ⁽¹¹⁾ rightly state that to reduce the death and disability that result from smoking, a programme should aim at *three main objectives*:

1. to discourage young people from starting to smoke;
2. to reduce the number of people now smoking;
3. to encourage the development of less hazardous cigarettes and methods of smoking and at the same time to persuade smokers to turn to them.

Of the several possible ways leading to the first objective, it is felt that the most effective would be:

- a) to educate the young by all the

means and media available, especially by television and the cinema, about the dangers of smoking;

b) to discourage smoking in the presence of non-smokers;

c) to abolish *all* kinds of tobacco advertising.

Admittedly, objective number two is the hardest to achieve. It is said that tobacco smoking is an addiction, but "addiction refers to alteration in the body's biochemistry resulting from exposure to a drug. There is little evidence that basic alterations of this nature play any significant role in cigarette smoking" (21).

Smoking is certainly a "bad" habit, and as with all such habits difficult but not impossible to break. In this respect half-hearted measures are worse than useless and, besides adopting measures already mentioned, more drastic steps should be taken to "help" the confirmed smoker to overcome his habit. Smoking should not be allowed in public places and should be absolutely forbidden in Government Departments. Private enterprise should be persuaded to follow this lead. Smoking has not been permitted at the Chest Clinic at St. Luke's for some years now, and Chest and Heart posters on the dangers of smoking are on view at the entrance to the Clinic.

Several attempts have been made to make smoking less hazardous to health. Tobacco monopolies in Canada, Sweden, U.S.A., Austria and Japan have lowered the amount of tar and nicotine content in tobacco. Others have claimed that special filters appear to give protection against particulate matter in smoke, but there may be other harmful chemicals in tobacco smoke which are unaffected by filters (21). Discarding the last third of the cigarette, where a high concentration of tar and nicotine accumulates, helps to reduce the amount of harmful substances inhaled. Some have advocated a substitute for tobacco, while in a recent letter to the "British Medical Journal" it was suggested that smoking of nicotine alone should help to replace the cigarette (26).

But the only certain protection is not to smoke at all; after all "If the Almighty

had meant you to smoke, he would have put a chimney in your head."

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