

PASSIVE SMOKING*

James A. R. Friend, Chest Clinic, City Hospital, Aberdeen

It is a shocking thing, blowing smoke out of our mouths into other people's mouths, eyes and noses, and having the same thing done to us

Samuel Johnson

Passive smoking, also called involuntary or second-hand smoking, occurs when environmental tobacco smoke (ETS) is breathed in. Most non-smokers, and quite a few smokers, find it unpleasant to be in a very smoky atmosphere created by smokers; the true risks of passive smoking need to be carefully examined. If there is a serious danger to the health of non-smokers, then the liberty of smokers to smoke is outweighed by the wider issue of public health and safety. Passive smoking is becoming something of a Trojan horse for the tobacco industry: a minor curiosity which threatens, through a series of legal claims, to become a serious threat.

Constituents of tobacco smoke

Tobacco smoke contains a range of 4,000 different gases and particles. The major gases include carbon monoxide, hydrogen cyanide, ammonia, acrolein, nitrogen oxides, and nitrosamines—the latter are known to be carcinogenic. 'Particulates' include nicotine, benzene, and a variety of known carcinogens including benzo(a)pyrene, tars, and polonium-210. So-called *mainstream* tobacco smoke, which is the smoke inhaled in high concentration by smokers as they 'draw' on a cigarette, arises at a high burning temperature, and amounts to about 15 per cent of the smoke produced by a cigarette; the remainder, usually called *sidestream* smoke, comes from the low-temperature smouldering of the tobacco, and is inhaled by smokers and non-smokers in a concentration which varies with the size, and thus the dilution effect, of the room, and the number of persons smoking within it. The concentration of most of the constituents of smoke is much higher in sidestream smoke than in mainstream smoke. The Environmental Protection Agency in the USA has classified environmental tobacco smoke as a class A carcinogen along with asbestos, benzene, and radon gas.¹

Effects of active smoking

Active tobacco smoking is known to be harmful and in the UK it represents the greatest identified preventable cause of ill health. Despite this being a familiar, almost hackneyed statement, there is sometimes a lack of appreciation of the *scale* of the problem of smoking, even amongst the medical profession. Before examining the risks of passive smoking, it is important to remember that in the UK active smoking accounts for 110,000 premature deaths annually. In Scotland bronchial cancer is the commonest cause of death from malignant disease in both men and women. Half of all smokers can expect to die, on average 8 years earlier than their non-smoking contemporaries, from 'smoker's diseases'.

*Based upon a lecture delivered at the Symposium on *The Lung Under Attack* held in the College on 8 November 1995.

Current smoking levels in the UK

Among adults, 29 per cent of men, and 28 per cent of women smoke at present. At the age of 15, however, 26 per cent of boys are regular smokers, and 30 per cent of girls in England. We in Scotland can take a little encouragement from the finding that 20 per cent of our 15 year old boys and 23 per cent of girls are regular smokers.² However, in the UK as a whole, girls and young women represent the only group where smoking levels have been increasing; in general, smoking levels in all other groups have declined.

Passive smoking

In utero. Maternal smoking during pregnancy has major effects on the foetus. Rates of stillbirth, miscarriage, and neonatal death are increased by 30 per cent,³ and the risk of prematurity is doubled. On average, the birthweight of babies born to mothers who smoke during pregnancy is 200 g lower and they may have impaired intellectual development,⁴ and an increased rate of congenital abnormalities, especially among older mothers who smoke. Smoking during pregnancy is an independent risk factor for such outcomes even when social class, maternal age, and family size are taken into account, and there is a clear dose effect for different smoking levels. It has even been suggested that children born to smoking mothers are at a doubled risk of the subsequent development of childhood malignancies such as lymphoblastic leukaemia, Wilm's tumour, and Non-Hodgkin's lymphoma.⁵ A British study demonstrated such an effect of maternal smoking,⁶ but other studies have not demonstrated such a significant level of effect,^{7,8} and there is a need for further study of this area in view of the many confounding factors, usually small numbers, and difficulties with study methods. Probably more significant is the finding that exposure to maternal smoking during pregnancy seems to lead to reduced neonatal lung function.⁹ There is always some difficulty in the interpretation of such apparent *in utero* effects; 90 per cent of mothers who smoke during pregnancy continue to do so for 5 years or more after delivery, and it is therefore not easy to separate the prenatal effects of maternal smoking from those arising after birth.

In infancy and childhood. A series of reviews on the effects of passive smoking on children show the range and strength of evidence which indicates the major effects of parental smoking on growing children.¹⁰⁻¹² There is good evidence of the much increased risk of cot death (Sudden Infant Death Syndrome) in families where parents smoke.¹³ The lungs of young children are also affected, with a prolonged effect on lung growth and respiratory function. There is a dose-related increased risk of lower respiratory tract infection in the first 2 years of life, the risk increased by 50 per cent if the mother smokes at all, and by 80 per cent if the mother smoked more than 20 cigarettes a day.¹⁴ Those who are exposed to tobacco smoke in the first year of life have increased bronchial hyper-responsiveness when they are older.¹¹ Glue ear is also 30 per cent commoner in families where adults smoke.¹⁵ As children grow older, there is ample evidence of impaired lung function in the children of smoking mothers, with an average reduction of the Forced Expiratory Volume in 1 second of 7-10 per cent.

The prevalence of asthma in children up to the age of five is approximately doubled in families where the mother smokes,¹⁶ and for children aged 5-11, the risk of wheeze, cough and bronchitis is 30 per cent higher for households where the mother smokes 10 cigarettes a day, and 60 per cent higher where she smokes

20 per day.¹⁷ In many studies, there is convincing evidence that the risk of asthma increases with smoke exposure, whether measured by the numbers of cigarettes smoked by the parents, or by directly measuring cotinine in the children's saliva as an index of smoke 'dose'.¹⁰

In adults. In 1981, Takeshi Hirayama published a major report¹⁸ from Tokyo, where over 90,000 non-smoking wives were followed up for 14 years, and their standardised mortality rates for lung cancer were assessed according to the smoking habits of their husbands. A clear dose-response relationship was shown, with the SMR for lung cancer being 60 per cent higher where the husband smoked up to 19 cigarettes per day, and more than doubled for those whose husbands smoked over 20 a day. This paper stimulated a host of further studies and much controversy, not least from the tobacco industry but there has been general confirmation of the findings. In 1988 the Government's Independent Scientific Committee on Smoking and Health, chaired by Sir Peter Froggatt, examined the evidence and published conclusions.³ They reported that 'several hundred out of the current annual total of about 40,000 lung cancer deaths in the United Kingdom' could be attributed to environmental tobacco smoke, and recommended that the risk of lung cancer from passive smoking should be given further publicity. In a further comment, the Committee also stated that 'ETS may have a far more widespread effect, enhancing ... childhood respiratory illnesses ... contributing to respiratory disease in adult life among non-smokers'.

As to other health risks of passive smoking in adult life, there have been relatively few studies looking at airway disease in those who are exposed to ETS at work or at home,¹⁹ and these have been difficult to interpret. However, one major recent study, the SAPALDIA Study, from Switzerland,²⁰ points to a significant effect. Investigating a random sample of over 9,500 adults, it was found that 4,000 were life-long non-smokers. Assessing their exposure to ETS both at home and at work, there was an increasing likelihood of wheeze, bronchitis symptoms, and doctor-diagnosed asthma with increasing daily hours of exposure to smoke, and with increasing intensity of exposure.

Although active smoking is a significant risk factor for a range of other diseases, including ischaemic heart disease, peripheral vascular disease, and peptic ulceration, there is no clear evidence that passive smoking increases the risks of these diseases in non-smokers.

Quantifying the risk of passive smoking

The very major risks of active smoking are well established and the numbers of those suffering and dying of smoker's diseases are well known, even if we sometimes do not fully appreciate the *scale* of the problem. In comparison with this, the risks of passive smoking may not initially seem large. While the numbers of those who develop lung cancer as a result of passive smoking are likely to be small, for the individuals concerned it must be particularly hard to accept that the disease is inflicted by the habits of others. It is even harder to quantify the numbers of children and adults who have respiratory illness from passive smoking; but it has been estimated, for instance, that 17,000 admissions of children under 5 each year in the UK can be attributed to passive smoking.²¹ Passive smoking may well have played a part in the increase of childhood asthma in the last 25 years or so. The importance of passive smoking as a health hazard begins to seem more and more important as the evidence accumulates.

What is the importance of passive smoking?

Passive smokers can be said to be the 'innocent victims' of tobacco smoke, and this is perhaps most worrying when those affected are children, who as a consequence may not achieve their full physical and intellectual potential, and yet have no real choice in the matter. This is not to blame the smokers for the problem—many smokers are themselves victims of a habit acquired at a time when such risks were not appreciated, and maintained by the addictive power of nicotine. Passive smoking raises the issue of personal freedom, both for smokers who feel that they should be able to choose to smoke if they wish, and for the non-smokers who feel that they have a primary right to breathe air which is safe and unpolluted, whether at their home, the workplace, and in public areas and buildings. The very fact that people smoke at home and in public seems to make the habit acceptable and plays some part in making smoking acceptable and even attractive, and almost certainly encourages young people to take up the habit themselves.

The legal position

The issue of passive smoking has not so far had a major exposure in the law courts, but a number of skirmishes between the tobacco industry and organisations and individuals have taken place. In 1986, as an expression of the industry's anxiety about the issue, the Tobacco Institute of Australia placed an advertisement in which they stated that 'passive smoking cannot be shown to be a health risk'. The Australian Federation of Consumer Groups brought a case against the Institute on the grounds that the advertisement was misleading and deceptive. There was a lengthy case, where both sides brought major international scientific expert witnesses: Justice Morland finally gave judgement for the Federation of Consumer Groups, having regarded their evidence as much more convincing.²² There have so far been no successful claims by people who believe their health to have been affected by passive smoking in the UK; several such cases are currently being prepared, but only one case has been settled, but as the settlement was out of court, it cannot be considered as a precedent. The case was brought by Beryl Roe, who sued Stockport Borough Council for the consequences of Environmental Tobacco smoke at work, which caused early retirement with 'bronchial attacks, and ear, nose and throat irritation'. The case was settled without admission of liability, for £25,000.

The future

All over the world the tobacco companies are coming under increasing pressure as the health effects of both active and passive smoking become more widely known. Unfortunately, they continue to develop new and profitable markets for tobacco products in Africa, South America, Eastern Europe, and Asia and choose to ignore or deny the known risks to health. There are predictable protests when measures are introduced to prevent smokers from smoking in communal places such as in public buildings, public transport, in the workplace and hospitals. Such moves are however generally well accepted by smokers as well as non-smokers, provided the measures are introduced with consultation, and in such a way that the smokers are not labelled as deviants, but rather as victims of a habit or addiction, and perhaps also as victims of an industry. Smokers therefore need both understanding and support; a progressive non-smoking policy which provides help with smoking cessation has the best chance of succeeding.

The real enemies are not the smokers themselves, but the tobacco industry who continue to promote a dangerous product worldwide, and governments who are unwilling to introduce a fully effective control on tobacco promotion. In 1991, several major organisations published a document on the health risks of passive smoking,²³ and included in it a poster which listed the organisations who had spoken on the passive smoking issue. The poster listed 61 organisations which supported the view that passive smoking was harmful, including the Royal College of Physicians of Edinburgh: on the list of organisations stating that passive smoking is not harmful there was only one entry—'the Tobacco Industry'.

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SICK BUILDING SYNDROME*

p. Sherwood Burge, Occupational Lung Disease Unit, Birmingham Heartlands Hospital

The sick building syndrome consists of dryness of the eye, nose, throat and skin together with headache and lethargy, which improve when the sufferer is away from a particular building. Symptoms are more common in women than men, in those lower down the office hierarchy, and in those who are stressed by their working environment. Symptoms are slightly more prevalent in those working with a visual display unit (VDU), in those handling paper and in non-smokers exposed to the tobacco smoke of others. Office workers have been the principal group studied, because of their uniform exposures and general lack of confounding factors. Many of the factors associated with sick buildings, such as lack of windows, increased temperature and lack of environmental control, are common in hospitals, particularly in x-ray departments. The main determinant of symptoms is the building; factors associated with air-conditioning being the most important.

SYMPTOMS

All the symptoms described are common in the general population and the distinguishing feature which identifies the syndrome is their temporal relationship with work in a particular building; all but the skin symptoms should improve within a few hours of leaving a problem building.

Lethargy and headache

A general feeling of tiredness is often the most prevalent symptom,¹ usually starting within a few hours of coming to work, and improving within minutes of leaving the building. In the more severe variety recovery takes some hours. Symptoms may be seasonal in northern climates and being worse in the winter months, a potential relationship with sunlight is suggested.

The typical headache is non-migrainous, and is often described as a pressure on the head. It is rarely throbbing, usually being described as dull. It is rarely referred to the face, making an association with rhinitis or sinus disease less likely.

Involvement of the mucous membranes

The eye, nose and throat are affected; the most common symptom is the sensation of a blocked or stuffy nose and, less often, sneezing and running of the nose. The latter are typical of allergic rhinitis due to an inhaled allergen and their lack makes an allergic mechanism less likely.

A dry throat, perhaps associated with increased thirst, is the next most prevalent mucous membrane symptom. It can be an important problem in those who use their voice professionally, such as broadcasters or telephonists.

Although the least prevalent mucous membrane symptom, dry eyes can cause problems in those wearing contact lenses, who may be unable to use them throughout the day. Objective signs include a reduced foam in the inner epicanthus, and an increased tear film break up time²⁻⁴

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