Mortality and smoking in Hong Kong: case-control study of all adult deaths in 1998

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Abstract

Objective To assess the mortality currently associated with smoking in Hong Kong, and, since cigarette consumption reached its peak 20 years earlier in Hong Kong than in mainland China, to predict mortality in China 20 years hence.
Design Case-control study. Past smoking habits of all Chinese adults in Hong Kong who died in 1998 (cases) were sought from those registering the death.
Setting All the death registries in Hong Kong.
Participants 27 507 dead cases (81% of all registered deaths) and 13 054 live controls aged ≥35 years.
Main outcome measures Mortality from all causes and from specific causes.
Results In men aged 35-69 the adjusted risk ratios (and 95% confidence intervals) comparing smokers with non-smokers were 1.92 (1.70 to 2.16) for all deaths, 2.22 (1.94 to 2.55) for neoplastic deaths, 2.60 (2.10 to 3.21) for respiratory deaths (including tuberculosis, risk ratio 2.54), and 1.68 (1.43 to 1.97) for vascular deaths (each $P<0.0001$). In women aged 35-69 the corresponding risk ratios were 1.62 (1.40 to 1.88) for all deaths, 1.60 (1.33 to 1.93) for neoplastic deaths, 3.13 (2.21 to 4.44) for respiratory deaths, and 1.55 (1.20 to 1.99) for vascular deaths (each $P<0.001$). If these associations with smoking are largely or wholly causal then, among all registered deaths at ages 35-69 in 1998, tobacco caused about 33% (2534/7588) of all male deaths and 5% (169/3341) of all female deaths (hence 25% of all deaths at these ages). At older ages tobacco seemed to be the cause of 15% (3017/20 420) of all deaths.
Conclusions Among middle aged men the proportion of deaths caused by smoking is more than twice as big in Hong Kong now (33%) as in mainland China 10 years earlier. This supports predictions of a large increase in tobacco attributable mortality in China as a whole.

Introduction

Tobacco related mortality needs to be assessed separately in many different populations, as it may differ substantially from one population to another in ways that are difficult to predict. China, with 20% of the world's population, now smokes 30% of the world's cigarettes,[1] and direct evidence is needed of the eventual effects of this on Chinese mortality. However, the main increase in cigarette consumption took place 40 years later in China than in the United States, so it is too early for the full hazards yet to be seen, and we cannot necessarily assume that the disease specific hazards in China will be similar to those documented in Western countries. Large case-control studies were therefore conducted in mainland China that assessed the hazard 10 years ago,[2] and large prospective studies have been set up that will eventually monitor the evolution of the Chinese epidemic of tobacco attributable mortality, but it will be some decades before these prospective study results mature.

In the largely (95%) Chinese population of Hong Kong, however, the prevalence of cigarette smoking reached its peak about 20 years earlier than in mainland China, and the present case-control study assesses the mortality currently associated with smoking among them.

Subjects and methods

We undertook a large case-control study in which the cases were all ethnic Chinese people aged 35 or over whose deaths were registered in Hong Kong in about 1998 (mid-December 1997 to mid-January 1999). For each such death, information was sought from the registry about the medical cause of death and, from the person reporting the death (the informant), about the dead person's smoking habits 10 years earlier—that is, before there was much chance of the habits being changed by the disease that eventually caused death.

We used a questionnaire that had two sections asking the same questions, one for the dead person (case) and one for a living person (not the informant), who served as a control. We collected complete information on 27 507 cases aged ≥35 (81% of all those eligible) and on 13 054 controls.

Results

For deaths from all causes, the risk ratio (smokers versus non-smokers standardised for age and education) was significantly elevated in middle aged men (1.92), elderly men (1.41), middle aged women (1.62), and elderly women (1.68), each $P<0.0001$. We found

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BMJ 2001;323:361–2

What is already known on this topic

China, with 20% of the world's population, smokes 30% of the world's cigarettes. Men smoke most, and the proportion of male deaths at ages 35-69 attributable to tobacco has been predicted to rise over the next few decades from 13% (in 1988) to about 33%

In Hong Kong cigarette consumption reached its peak 20 years earlier than in mainland China, so the epidemic of male deaths from tobacco should now be at a more advanced stage

What this study adds

In the general population of Hong Kong in 1998 tobacco caused about 33% of all male deaths at ages 35-69 plus 5% of all female deaths, and hence 25% of all deaths at these ages

In the male smokers tobacco caused about half of all deaths at ages 35-69

The hazards now seen in Hong Kong foreshadow a substantial increase in tobacco deaths among middle aged men in mainland China over the next few decades if current smoking patterns persist

significantly elevated risk ratios for malignant neoplasms and for respiratory disease in all four groups. For lung cancer, high risk ratios were found in all four groups, ranging from 3.06 in middle aged women to 4.99 in middle aged men.

In the middle aged men the risk ratios were significantly elevated for all main types of cancer apart from colorectal cancer. For respiratory diseases, the risk ratios were 3.68 for chronic obstructive pulmonary disease and 2.54 for respiratory tuberculosis, while, for vascular diseases, the risk ratios were 1.75 for stroke and 1.58 for ischaemic heart disease: all of these risk ratios were highly significant ($P < 0.001$).

Both in middle age and old age the death rates were significantly higher in smokers than in non-smokers. If this excess is largely or wholly causal then in Hong Kong in 1998 the numbers of deaths attributable to smoking were about 2534/7588 (33.4%) in middle aged men, 2019/10 107 (20.0%) in elderly men, 169/3341 (5.1%) in middle aged women, and 998/10 313 (9.7%) in elderly women. This indicates that the total number of deaths attributable to tobacco among people aged ≥35 was 5720 (18.2% of 31 349) and that tobacco was a cause of 25% (2703/10 929) and 15% (3017/20 420) of all deaths in middle aged and elderly people, respectively, in Hong Kong in 1998.

Discussion

Our study is the first to assess the hazards in a Chinese population that is at a fairly advanced stage of the epidemic of tobacco deaths among middle aged men, so it may well foreshadow what will happen among men throughout mainland China (and in other developing countries) over the next few decades. If the excess mortality among smokers is accurately estimated and is largely or wholly causal then about half (48%) of the deaths of male smokers in middle age are due to tobacco. Even among men who were "light" smokers about a third of all premature deaths were due to tobacco.

Although only a moderate hazard from smoking was found at an early phase of the growing epidemic of deaths from tobacco in mainland China,[2] our study in Hong Kong shows a larger hazard at a later phase of the epidemic. The proportion of deaths attributed to smoking is more than twice as big in Hong Kong in 1998 as it was in mainland China 10 years earlier,[2] which is consistent with the prediction of a large increase in mortality attributable to tobacco in China over the next few decades,[1] unless there is widespread cessation by adults who already smoke.[3]

We thank our research staff and the Immigration Department of the Government of the Hong Kong Special Administrative Region. We particularly thank the relatives who provided information for this study.

Funding: Hong Kong Health Services Research Committee (631012) and Hong Kong Council on Smoking and Health, plus direct support to CTSU by the Imperial Cancer Research Fund and the Medical Research Council.

Competing interests: None declared.

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(Accepted 5 July 2001)

Memorable patients

Those who sit and wait

We have been fortunate as a family to have had little need for healthcare services in recent years. A few months ago, however, two members of the family were unwell within days of each other, and their differing experiences made me reflect that we have some way to go to achieve equity in the delivery of health care.

Lynne, my wife, had a persistent productive cough, fever, and malaise. On arrival at the surgery, a receptionist confirmed her appointment and pointed to the adjacent waiting room. The buzz of conversation within centred on the fuzzy summons that would occasionally crackle from the intercom. The younger patients were intermittently able to catch the names broadcast and could enlighten those who were anxious and perplexed. The atmosphere of uncertainty was heightened as, at intervals, frustrated patients sighed and returned to the lobby to seek assurance from the receptionist that they had not been forgotten. After an hour, Lynne was finally seen.

Two days later, it was Julie's turn to develop bouts of coughing precipitated by exercise. Julie attends a different practice in the town. Here, the waiting room was quiet, and her doctor came out to greet her. She was seen a few minutes before her appointment time.

How could two surgeries in the same town offer such a different service? Perhaps it is not so surprising. Lynne is only human, after all, and Julie? She's a Labrador retriever.

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