

Mortality associated with passive smoking in Hong Kong

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Passive smoking can cause death from lung cancer and coronary heart disease, but there is little evidence for associations with other causes of death in never smokers. A recent study showed increased all cause mortality with exposure to secondhand smoke at home but did not examine associations with specific causes of death and dose-response relations.¹ We have published estimates of the mortality attributable to active smoking in Hong Kong² and now present the related findings on passive smoking at home.

Participants, methods, and results

Details of the sample selection and data collection have been reported.² Each person who reported a death in 1998 at four death registries was given a questionnaire which asked about the lifestyle 10 years earlier of the decedent and of a living person about the same age who was well known to the informant. Passive smoking was identified in the interview with the question, "Ten years ago, in about 1988, excluding the decedent/control, how many persons who lived with the decedent/control smoked?" Decedents or controls who lived with one or more smokers were classed as exposed. Cause of death was obtained from the death certificate.

We selected never smoking decedents and controls aged 60 years or over because there were few younger controls. To avoid selection bias, we included only cases and controls who had a living spouse at the time of reporting. We used logistic regression to derive odds ratios adjusted for age and education, and for sex when men and women were combined.

We identified 4838 never smoking cases (55% male) and 763 never smoking controls (55% male). All controls were used in the analysis for each specific cause of death.

We found significant dose dependent associations between passive smoking and mortality from lung cancer, chronic obstructive pulmonary disease, stroke, ischaemic heart disease, and from all cancers, all respiratory and circulatory diseases, and all causes (table). The association between mortality and passive smoking did not differ between males and females. Deaths due to injury or poisoning were not associated with passive smoking.

Comment

Dose dependent associations between passive smoking and causes of death are consistent with previous findings for lung cancer and coronary heart disease and extend the evidence on stroke. Previous studies have shown associations between passive smoking and first acute strokes,^{3 4} and we have now shown a dose-response relation with mortality from stroke. Previous studies focused on ischaemic strokes but Chinese populations have a greater incidence of haemorrhagic stroke than do white populations,⁵ implying that many of the strokes in our study may have been non-ischaemic. Passive smoking probably affects all stroke subtypes, as does active smoking.

Our finding of a 34% increase in all cause mortality is consistent with but higher than that (15%) in the New Zealand cohort.¹ Exposure to secondhand smoke at home is higher in Hong Kong than in New Zealand due to crowded living

Number of subjects who were or were not exposed to secondhand smoke at home and odds ratios (adjusted for age and education, and for sex when men and women were combined) for mortality in people aged 60 or over, Hong Kong. Values are odds ratio (95% confidence interval) unless indicated otherwise

Cause of death	By sex				All	By exposure (compared with no exposure)			P for trend
	Men		Women			1 smoker	2 or more smokers		
	Exposed/ not exposed	Odds ratio (95% CI)	Exposed/ not exposed	Odds ratio (95% CI)					
Cases									
Cancer:									
Lung cancer	33/112	1.34 (0.82 to 2.17)	96/83	1.38 (0.94 to 2.04)	1.39 (1.03 to 1.88)*	1.30 (0.94 to 1.80)	1.74 (1.06 to 2.86)*		0.014
All cancers	166/685	1.16 (0.85 to 1.60)	396/368	1.35 (1.03 to 1.76)*	1.27 (1.03 to 1.55)*	1.14 (0.92 to 1.43)	1.74 (1.22 to 2.48)***		0.003
Respiratory:									
COPD	27/69	1.67 (0.95 to 2.94)	27/15	2.90 (1.34 to 6.29)**	1.99 (1.28 to 3.10)***	1.85 (1.14 to 3.00)*	2.51 (1.22 to 5.18)*		0.002
All respiratory	103/374	1.29 (0.87 to 1.92)	126/118	1.52 (1.01 to 2.27)*	1.41 (1.07 to 1.87)*	1.31 (0.97 to 1.78)	1.80 (1.11 to 2.91)*		0.007
Circulatory:									
Stroke	65/232	1.31 (0.87 to 1.99)	158/142	1.57 (1.11 to 2.24)*	1.49 (1.15 to 1.94)***	1.34 (1.01 to 1.79)*	2.08 (1.33 to 3.25)***		0.001
IHD	74/285	1.30 (0.88 to 1.93)	113/112	1.39 (0.95 to 2.04)	1.35 (1.03 to 1.76)*	1.26 (0.94 to 1.69)	1.68 (1.05 to 2.68)*		0.015
All circulatory	177/664	1.29 (0.93 to 1.79)	342/334	1.36 (1.02 to 1.81)*	1.35 (1.09 to 1.68)**	1.27 (1.01 to 1.61)*	1.66 (1.13 to 2.42)**		0.002
Injury and poisoning	14/63	1.02 (0.53 to 1.97)	20/29	0.81 (0.43 to 1.52)	0.95 (0.60 to 1.49)	1.03 (0.64 to 1.67)	0.65 (0.25 to 1.74)		0.594
All causes	552/2128	1.25 (0.94 to 1.66)	1112/1046	1.41 (1.11 to 1.79)**	1.34 (1.12 to 1.61)***	1.24 (1.02 to 1.52)*	1.73 (1.24 to 2.40)***		<0.001
Controls	71/347		150/195						

COPD=chronic obstructive pulmonary disease; IHD=ischaemic heart disease.
*P<0.05, **P<0.01, ***P<0.005 on logistic regression.

What is known on this topic

There is strong evidence that passive smoking is causally associated with death from lung cancer, coronary heart disease, and all causes, and also with acute stroke

What this study adds

The dose-response relation between passive smoking and mortality from stroke and chronic obstructive pulmonary disease, as well as from lung cancer, ischaemic heart disease, and all causes of death, strengthens the causal link

conditions. Before the 1990s, awareness of the danger of passive smoking was lower and smokers smoked freely at home.

We focused on passive smoking at home because the proxy reporter could most reliably supply these data, and we adjusted for education, which was also reliably recorded² and is a good proxy for social class in Hong Kong. As data on cases and controls were derived from the same proxy, reporting bias should be minimal.² If our results are not due to residual confounding, they provide further evidence that the dose-response associations between passive smoking and stroke and all cause mortality are likely to be causal.

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Competing interests: THL is vice-chairman and AJH a former chairman of the Hong Kong Council on Smoking and Health.

Ethical approval: Ethics Committee of the Faculty of Medicine, University of Hong Kong.

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