Commentary: Tobacco-related diseases: a gender differential?

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Several of the earlier studies on smoking-related mortality have shown lower risks in female compared to male smokers due to limited smoking exposure in the generations of smokers that these studies were based on. Studies that include many heavily smoking women such as the Renfrew and Paisley Study are therefore welcome. A previous study based on a sample of the population in Copenhagen, Denmark, which also has a high prevalence of smoking among women, suggested gender differences in effects of smoking on cause-specific and all-cause mortality. These findings could not be reproduced using data from the Renfrew and Paisley study in Scotland and possible explanations are warranted.

The two study populations seem very similar: they were both representative of the general population, they were sampled in the 1970s, they included a large number of men and women of similar age groups and smoking rates were high. In fact, Denmark and Scotland are very similar in that in both countries women took up smoking early in the smoking epidemic and the prevalence of smoking among women is now among the highest in the world.

In the Danish study population we have found gender differences in smoking-related risk of cardiovascular disease and chronic obstructive pulmonary disease (COPD), but not in lung cancer. For COPD similar results have been shown in several studies although only few studies have used hard end-points and none have used mortality data. Respiratory diseases account for only approx 6% of all deaths and a study of gender difference in smoking-related mortality risk would need very large population samples. However, according to the Danish mortality statistics, mortality rates from COPD in the age group 45–54 years have been higher in women than in men since 1985, and since 1990 this has also been the case for the age group 55–64 years (personal communication, K Juel, National Institute of Public Health). This is surprising since these generations of women have accumulated smoking exposures that are considerably lower than the men’s. This may in part be due to competing risks, but the higher mortality rates in women may also indicate difference in susceptibility since COPD is almost solely caused by smoking.

For cardiovascular disease, earlier studies such as the British Doctors study and the Framingham study have found smaller relative risks (RR) in women. However, several more recent studies find higher RR in women and an interesting hypothesis is that in women the anti-oestrogenic effect of smoking should be added to the thrombogenic effect. Naturally, cardiovascular disease is multifactorial and other strong risk factors may vary differently according to smoking status in women and men, and in different study populations. An attempt to adjust for this was done in the Danish study population which still yielded significantly higher RR associated with smoking in women than in men after adjustment. Interestingly, a similar result was found in the Scottish Heart Health Study.

Thus in the Danish study sample these gender differences seem relatively stable. Marang-van de Mheen and co-authors suggest the differences between the two findings may be due to the fact that in the Danish study non-cigarette smokers were included. We have not had the opportunity to repeat our analyses on the entire data-set but in the Copenhagen City Heart study, which constituted approximately half of the data in our original study, 19% if the women and 43% of the men were non-cigarette smokers. Taking into the analyses the type of tobacco smoked did not alter results—there were still higher RR associated with smoking in women, particularly for smokers of cigarettes. However, as pointed out by Marang-van de Mheen and co-authors, the question of increased susceptibility cannot be discussed without discussing absolute versus relative risk. In their study they clearly demonstrate that although RR were similar in men and women, the absolute risk attributable to smoking was much higher in men. We can offer no simple explanation to the different findings in the two studies and for the moment are satisfied that smoking is deleterious for both genders.

References


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