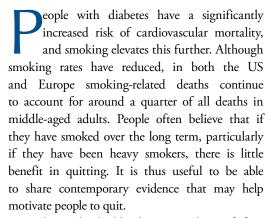# Smoking cessation cuts excess mortality rates after as little as 3 years

The mortality benefits of smoking cessation may be greater and accrue more rapidly than previously understood, according to data from four pooled national cohort studies published in *NEJM Evidence*. Mortality rates reduced significantly as early as 3 years after quitting and became comparable to those in people who never smoked after 10 years. Current smokers carried an almost three-times greater mortality risk than in those who never smoked, and quitting was associated with a 50% reduction in mortality. After adjusting for age, education, alcohol use and obesity, factors which differed between smokers and never-smokers, current female and male smokers had hazard ratios for mortality of 2.8 and 2.7, respectively, compared with never-smokers overall, translating into 12–15 years of life lost for those aged 40–79 years. Compared with those who continued to smoke, cessation for as little as 3 years in those aged <40 years was associated with a 95% and 90% reduction in excess mortality in women and men, respectively, highlighting the benefits of quitting as early as possible. This study provides us with updated data which we can share to help people understand the mortality benefits of quitting and hopefully encourage more people to stop smoking.

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People with diabetes have a significantly increased risk of cardiovascular mortality, and smoking elevates this further. Although smoking rates have reduced, in both the US and Europe smoking-related deaths continue to account for around a quarter of all deaths in middle-aged adults. People often believe that if they have smoked over the long term, particularly if they have been heavy smokers, there is little benefit in quitting. It is thus useful to be able to share contemporary evidence that may help motivate people to quit.

In this individual-level meta-analysis of four cohort studies from the US, Canada, Norway and the UK, Cho and colleagues explored mortality rates in smokers, former smokers and those who had never smoked, in order to identify the mortality benefits of cessation for different durations and at different ages. The US and Canadian cohorts were representative of their countries' demographics and enrolled those aged 20–79 years, while the UK (Biobank) and Norwegian cohorts enrolled those aged 40–73 years and 25–79 years, respectively. Countries' national death registries were linked and provided detailed information on causes of death.

Current smokers were defined as those smoking cigarettes daily or on some days when recruited to the study, while never-smokers had smoked fewer than 100 cigarettes during their lifetime. For former smokers (those with a history of smoking more than 100 cigarettes but who were not smoking at recruitment), the time since quitting was documented. Compared with never-smokers, current smokers on average had less education, more alcohol use and lower BMI, as did former smokers except Norwegian women, whose BMI was similar. Therefore, these factors were adjusted for in the analyses. Cessation duration of <1, <3, 3–9 and >10 years at study entry were recorded, and adjustments were made to account for estimated quit rates during follow-up.

Results

The total of nearly 1.5 million adults were followed for a mean 14.8 years, and there were 122 697 deaths in the 23 million person-years of follow-up. Among smokers, heavy smoking (≥20 cigarettes per day) was more common in men than women (32.4% vs 19.8%), but being a heavy smoker was associated with a slightly higher hazard ratio for mortality in women than men.

Mortality excess risk reductions

As expected, the highest mortality rates were in current smokers compared to never-smokers at all ages. By disease category, mortality hazard ratios were 7.6 and 6.3 in women and men, respectively, for respiratory diseases; 3.1 and 2.9 for vascular disease; and 2.8 and 3.1 for cancers. Former smokers had half the excess mortality of current smokers, with excess mortality rates being slightly higher in former heavy smokers.

When considering the hazard ratios, it is important to consider the age at quitting as well as the number of years since quitting. Absolute mortality risk differences as a result of cessation were largest at older ages, reflecting higher death rates amongst older people. Absolute risk differences for overall mortality for smoking cessation <3 years were 8.2% and 6.5% in women and men, respectively, at age 60–79 years, contrasted with 1.3% and 1.8%, respectively, in those aged <40 years; however, the latter had the largest survival gain (see below).

Survival following smoking cessation

Looking at people aged 40–79 years, female and male smokers potentially lose an average of 12 and 13 years of life, respectively, compared to those who have never smoked. For current smokers who die from smoking-related conditions, the potential loss of life-years attributable to smoking in women and men, respectively, is 14 and 10 years for vascular diseases; 12 years in both sexes for cancer; and 18 and 20 years, respectively, for respiratory diseases.

Cessation of 10 years or more among smokers of any age restores their survival to similar levels as those who never smoked, reclaiming on average 10 years of life which would otherwise have been lost. Much of this occurs in the first 3 years of quitting, with potential regain of around 5 years of life. The greatest survival gain (around 12 years) was observed in those who quit before 40 years of age, whilst around half of this gain was seen in those who quit at age 40–49 years, and there was still a 2.5-year gain even in those who quit at age 50–59 years.

Discussion

This study suggests that quitting confers significant mortality reductions as early as 3 years after stopping, avoiding up to 5 years of life lost, while quitting for 10 years and beyond reduces mortality risk to the level of those who never smoked. Overall, quitting reduces the mortality rate by 50%.

Quitting as young as possible, before long-term and irreversible damage to the lungs has occurred, seems logical. This study confirmed that even short-term cessation for least 3 years in those who quit prior to age 40 reversed 90% (in men) to 95% (in women) of the excess mortality risk attributable to smoking. There were also beneficial reductions in older age groups, and cessation at every age examined was associated with longer survival.

In an associated editorial, Ioannides and Prochaska (2024) explore smoking cessation and highlight the addictive potential of nicotine in cigarettes. Very-low-nicotine cigarettes (≤0.5 mg per gram of tobacco) have been studied in the US and have been shown to reduce the number of cigarettes smoked and possibly facilitate quitting. Use of nicotine replacement therapy, usually dual therapy, greatly enhances quit rates. Each 10% increase in the cost of cigarettes translates into a 4–5% reduction in smoking prevalence, making efforts to control tobacco use cost-effective. Although vaping (i.e. the use of electronic devices to deliver chemicals which can include nicotine) may help adults to quit, it is now recognised to be associated with addiction, dangers of lung injury, cardiovascular disease, and increased risk of lung and other cancers (Petrella et al, 2023).

Implications for practice

Smoking cessation is very important in the people with diabetes we support, as they are already at high risk of cardiovascular disease and some cancers. Very brief interventions for smoking cessation increase quit rates, particularly if we can immediately signpost to cessation services or prescribe appropriate nicotine replacement therapy (see NICE NG209 and *How to help people with diabetes stop smoking*).

When coping with our current workload, we should remind ourselves of the importance of making the time to deliver very brief interventions on smoking cessation, and it may also be valuable to update our approach. Sharing the mortality benefits associated with cessation may have more impact than warning of the hazards of smoking, which can be read on every pack. If we shared this information at every opportunity with people who smoke, could we encourage more people to quit? ■

References

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