Smoking reduction

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Executive summary

Smoking reduction, cutting down the cigarettes smoked per day, is common in the UK. However, the amount that people cut down by is relatively small and there is little evidence to suggest that reducing cigarette consumption in itself has a positive effect on smoking-related outcomes. This is most likely due to the fact that those who cut down compensate for this reduction by increasing the intensity with which they smoke cigarettes to maintain a relatively stable level of nicotine intake. Consequently, data suggest that smoking reduction does not significantly reduce smoking-related mortality or morbidity. Whilst unaided smoking reduction has not been reliably shown to increase quit attempts or smoking cessation rates, there is good evidence that the provision of nicotine replacement therapy (NRT) to people who cut down their cigarette consumption results in longer, substantial decreases in cigarette consumption and improves their chances to stop smoking completely. For this reason, NRT in the UK is now licensed for smoking reduction and available to people who cannot or are unwilling to stop smoking completely as a harm reduction measure.

Key points

1. Smoking reduction in the population

1.1 Prevalence

- Smoking reduction, cutting down the cigarettes smoked per day, is a common strategy for people who smoke to mitigate the financial and health effects of smoking and to move towards smoking cessation.[1] It is particularly appealing for people who cannot or will not stop.[2]
- Evidence from the UK suggests that over 50% of the smoking population currently report that they are attempting to reduce their cigarette consumption.[3]

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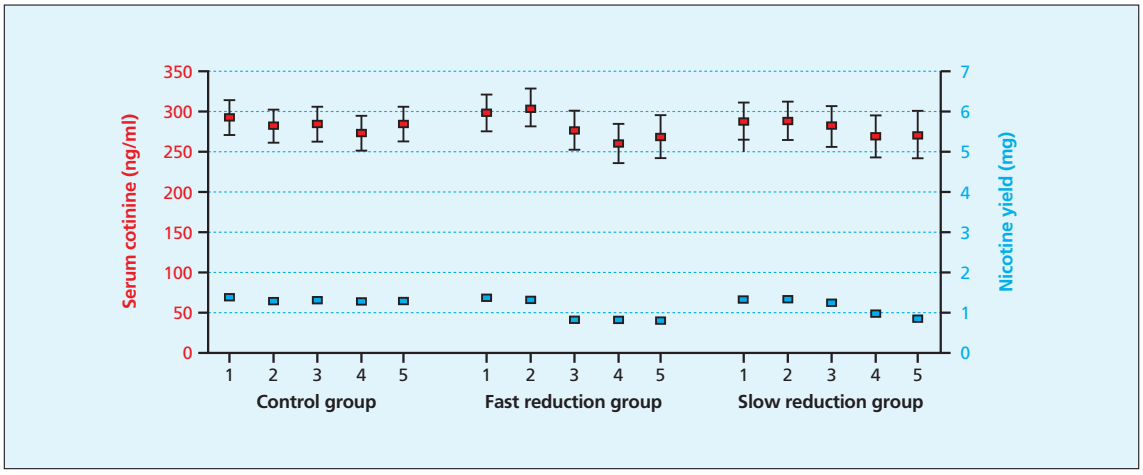
1.2 Compensatory smoking

- Whilst people who smoke attempting to cut down report on average to smoke two cigarettes fewer per day than those not trying to cut down[3], evidence suggests that there is not a linear relationship between cigarette consumption and exposure to cigarette smoke constituents such as nicotine or tobacco-specific carcinogens.[4,5]

- This is most likely due to 'compensatory smoking'. Most people use cigarettes to obtain a relatively constant amount of nicotine over the day.[6] However, besides the number of cigarettes smoked, there exist a number of other factors that impact the daily delivery of nicotine including the number, size, speed and intensity of puffs taken as well as the blocking of filter vents.[7] Thus when people reduce their cigarette consumption, they may compensate by adjusting the way they smoke cigarettes to maintain a desired level of nicotine.[8] Indeed, switching studies have shown that when people who smoke are randomised to 'low tar' cigarettes yielding less nicotine, they compensate to extract the same amount of nicotine from these cigarettes (Figure 1).[9]

Figure 1. Effect of compensation by people when smoking low tar cigarettes, as shown by blood levels of cotinine, with 95% confidence intervals, and related nicotine yield over time. Adapted from Frost et al, 1995.[9]



1 = run-in to study; 2 = entry; 3 = at 2 months; 4 = at 4 months; 5 = at 6 months.

- The consequence of 'compensatory smoking' may therefore be that smoking reduction does not result in a reduction of the harmful consequences of smoking because people will simply smoke each cigarette more intensely, receiving the same level of toxins as those not reducing their consumption. Short-term studies confirm that reducing cigarette consumption only leads to a relatively modest reduction in exposure to biomarkers of smoking-related harm.[10–12]

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2. Effects of unaided smoking reduction

2.1 Effects on quit attempts and smoking cessation

- Retrospective studies suggest that people attempting to reduce their consumption are more likely to have made previous quit attempts [3]; however, smoking reduction may be an after-effect of a failed quit attempt.[13,14] Longitudinal data suggest that unassisted smoking reduction may be associated with a greater likelihood of attempts to stop smoking in the short but not long-term.[15]
- Whilst data are mixed on the impact on quit attempts, smoking reduction may also increase the chances of successful quit attempts and thus increase cessation rates. There is some evidence that smoking reduction predicts greater abstinence rates in some[16–18] but not other studies.[19–21] Thus, current evidence is at best ambiguous as to whether unaided smoking reduction is effective for increasing quit attempts or smoking cessation.
- The interpretation of findings is further complicated by two factors: (1) Studies rely on self-selected samples and it may be that those who chose to reduce consumption are simply more motivated to stop than those who chose not to; (2) Where effects are found, smoking reduction is usually defined as reducing the amount smoked by ≥ 50%, whereas in the general population smoking reduction is usually only between 1–5%, not maintained long-term and less than 10% of people who cut down, reduce their consumption by more than 50%.[14]

2.2 Effects on health outcomes

- Given that there is no clear evidence that unaided smoking reduction increases abstinence rates, there is yet the possibility that smoking reduction per se decreases harm from smoking. The best evidence comes from large longitudinal studies such as reported in Figure 2, which suggest that there is no health benefit of smoking reduction on major smoking-related diseases.[22]

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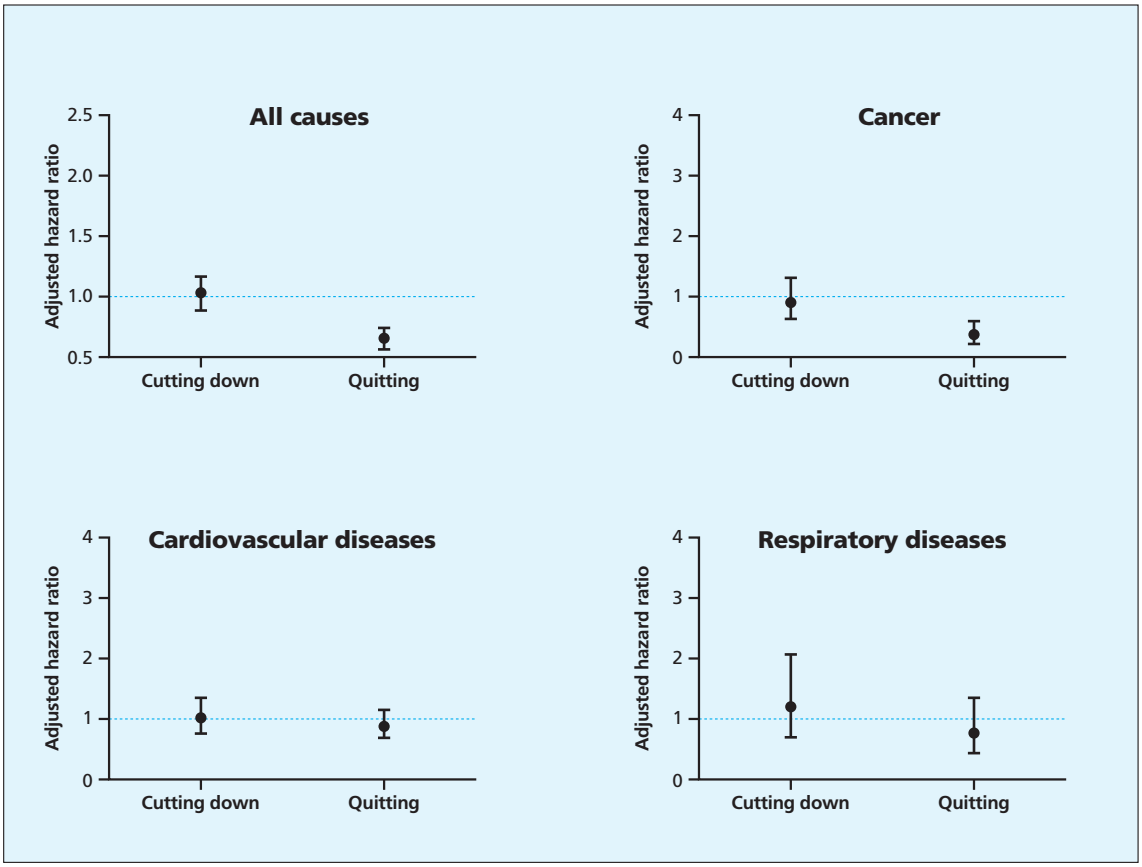
Figure 2. Data from large 16 year-long Danish cohort study showing hazard ratio of deaths from various causes adjusted for relevant confounders (95% confidence interval). Adapted from Godtfredsen et al, 2002.[22]



- There is also little evidence that smoking reduction improves lung function,[23] though there may be some marginal benefit if smoking reduction is sustained and substantial,[24] or that it substantially decreases lung cancer risk, myocardial infarction or COPD.[15,25]
- Lastly, studies have not found a positive effect of smoking reduction on post-operative complications or, among pregnant women who smoke, on infant birth weight.[15,25] Taken together, these results suggest that the reduction in cigarette consumption is likely to be largely counterbalanced by compensatory mechanism such as adjustment in smoking intensity leading to no or only very small changes in exposure to tobacco smoke and thus smoking-related health risks.

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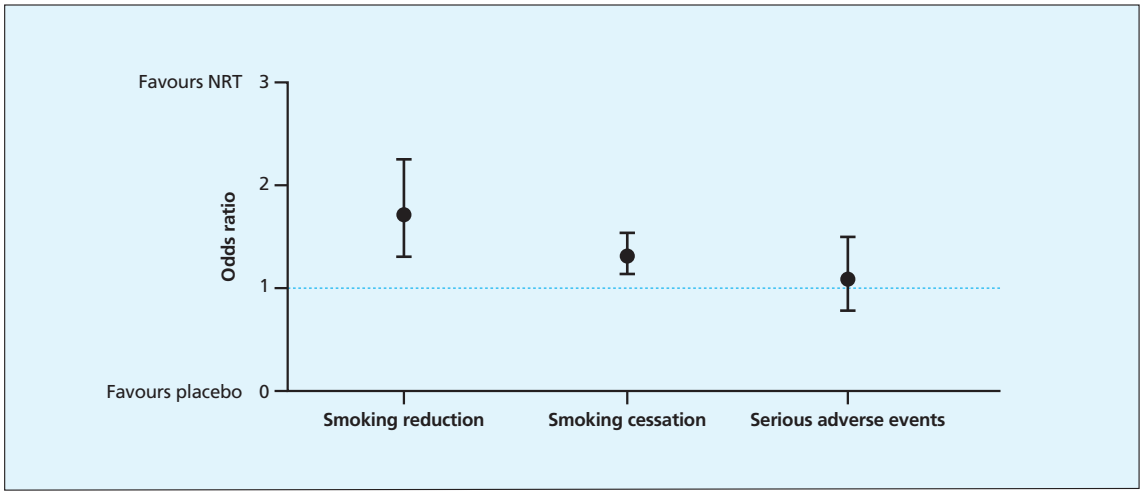
3. Smoking reduction and nicotine replacement therapy

- Whilst there is little evidence to support unaided smoking reduction as an effective harm control measure, recent data suggest a benefit of smoking reduction when it is accompanied by use of pharmacotherapy such as nicotine replacement therapy (NRT).[26]
- It has been speculated that use of NRT for smoking reduction may discourage people from making quit attempts or from stopping smoking as it may maintain nicotine dependence and reduce motivation to stop due to false reassurance that they are reducing harm from smoking; however, this fear has not been borne out by the data.[3,27]
- Results from studies in which individuals were randomised to either a placebo or NRT (mostly the nicotine gum or inhaler) suggest that the provision of NRT led to both sustained smoking reduction (≤ 50% of baseline consumption) and increased smoking cessation, while there was no evidence of an increase in adverse events (Figure 3).[26] The causal mechanism for this effect is unclear but may be due to increasing peoples' confidence in their ability to stop and reducing the reinforcing addictive potential of cigarettes, thus facilitating their transition to abstinence and to help maintain abstinence.[28]

Figure 3. Impact of NRT on smoking reduction, smoking cessation and serious adverse events (Pooled odds ratios with 95% confidence interval). Adapted from Moore et al, 2009.[26]



- On the basis of these positive findings, the licensing of some NRT products in the UK has now been extended to allow use for temporary abstinence and smoking reduction without a specific intention to quit completely.[29]

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