

Stopping smoking and body weight in women living in the United Kingdom

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SUMMARY

Most studies of the effect of stopping smoking on weight in women have been cross-sectional in design and have been conducted abroad. A survey of subjects still participating in the Royal College of General Practitioners Oral Contraception Study was used to examine changes in weight among women of different smoking status and living in the United Kingdom. During roughly a 26-year period, there was a threefold increase (to 15% in 1994/1995) in the prevalence of obese (body mass index [BMI] >30) women among the cohort. Women who stopped smoking had the largest increases in mean BMI and in the proportion of obese women at 1994/95. These results support the notion that stopping smoking leads to weight gain.

Keywords: smoking; weight gain; body mass index; obesity.

Introduction

Smoking continues to be a major public health problem, particularly among young women. Many female smokers appear reluctant to stop because they feel that they will inevitably gain weight.¹ So far, much of the evidence about the relationship between smoking and weight in women has come from cross-sectional studies,²⁻⁴ in which the direction of the association cannot be determined. Furthermore, many were conducted abroad,² where social and cultural expectations may be different to those in the United Kingdom.

Method

The Royal College of General Practitioners Oral Contraception Study is a 30-year-old longitudinal study of an initial cohort of 23 000 women who were using oral contraceptives and a similar number of women who had never done so.⁵ Follow-up has been mainly via the recruiting practices. Between November 1994 and July 1995, we sent a questionnaire for self-completion to the 12 303 women remaining in the study.⁶ The questionnaire included questions about lifetime smoking habits, weight at age 30 (close to the average age at recruitment), and height and weight when the questionnaire was completed. A regular smoker was defined in the questionnaire as someone who has smoked at least one cigarette a day for more than one year. Using this definition, each woman was asked whether she had ever smoked regularly and, if so, her age at starting, the number of cigarettes currently smoked, and, if applicable, age and daily cigarette consumption at stopping. This information enabled us to estimate

each woman's body mass index ([BMI]: weight in kg divided by the square of height in m²) when aged 30 in 1994/1995 and her smoking status when aged 30 in 1994/1995. Thus, we were able to examine changes in weight among women of different smoking status.

Results

There was an 85% response rate after three mailings. Complete weight and smoking information was available for 9198 women whose average age was 56 years (range = 42–81). Table 1 shows secular changes in mean BMI and the proportion of obese women (BMI >30) by smoking history.

During the period studied, the proportion of obese women increased threefold, from 4.6% at age 30 to 14.9% in 1994/1995. Compared with other women, those who stopped smoking showed the largest increases in mean BMI (3.37) and the largest increase in proportion of obese women at 1994/1995 (13.5%). Women who started smoking after the age of 30 or who continued to smoke had the smallest weight changes over time. There was a trend between change in BMI and time since stopping smoking (mean change in BMI in those who stopped less than five years previously = 3.67; 5 to 9 years = 3.71; 10 to 14 years = 3.44; 15 to 19 years = 3.23; 20 years and over = 2.57; $P < 0.05$).

Discussion

Our results support the notion that stopping smoking leads to weight gain.¹ Although based on self-reported information, the estimates of BMI for 1994/1995 were similar to those reported in national cross-sectional health surveys that had anthropometric measurements.^{3,4} Recall bias, whereby ex-smokers falsely recall being lighter at a younger age than they actually were, could have affected our results. Unfortunately, the incompleteness of many general practice medical notes regarding information about weight, especially those that referred to 20 to 30 years ago, prevents the comparison of contemporaneously recorded information with patient-recalled weight. In a small study of Danish patients with diabetes, recall of weight became increasingly variable the further back that a patient went (up to 10 years), but recall did not vary with smoking status.⁷ Differences between the various groups in social class, lifestyle, or concomitant illness are unlikely to be alternative explanations; others have found BMI to be independently related to smoking, regardless of age, social class of head of household, alcohol consumption, and physical activity.³

Our results also highlight a dramatic increase in the prevalence of obesity among this cohort of women, a phenomenon that has affected most Western populations. There have been many studies linking weight with ill-health. The Government's recent Green Paper, *Our Healthier Nation*,⁸ includes a draft national contract for tackling heart disease and stroke that includes lifestyle dietary advice aimed at reducing obesity. The observation that some crucial factors, such as smoking and obesity, are currently worsening or not improving,⁸ emphasises the need for action.

Few would advocate the continuation or commencement of smoking simply to avoid weight gain. However, it is important to

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Table 1. Changes in body mass index (BMI) and obesity.

Change in smoking since aged 30 years	Mean BMI			% Obese		
	When aged 30	At 1994/1995	Difference (95% CI)	When aged 30	At 1994/1995	Difference (95% CI)
No change — non-smoker (n = 5701)	23.28	25.94	2.66 (2.58–2.74)	4.4	15.0	10.7 (9.8–11.6)
No change — smoker (n = 1824)	22.93	24.88	1.95 (1.81–2.10)	4.6	11.0	6.4 (5.0–7.9)
Started smoking (n = 91)	23.28	25.13	1.84 (1.01–2.68)	5.5	14.3	8.8 (1.2–10.9)
Stopped smoking (n = 1582)	23.13	26.50	3.37 (3.20–3.54)	5.1	18.6	13.5 (11.7–15.4)
All women (n = 9198)	23.18	25.82	2.64 (2.57–2.70)	4.6	14.9	10.3 (9.6–11.0)

acknowledge with smokers the potential for weight gain if they stop smoking. Suggestions for clinician statements that may help a patient prepare for, and cope with, weight gain after smoking cessation have been published as part of recent guidelines.¹ Weight reduction initiatives might be targeted at ex-smokers in order to try and prevent a relapse back to smoking because of concerns about increases in weight. Such initiatives, however, should only be started once smoking cessation has been firmly established, otherwise, attempts to prevent weight gain might undermine the attempt to stop smoking.¹

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