REVIEW ARTICLE

Managing smoking cessation-related weight gain

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KEY WORDS

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ABSTRACT

About 80% of smokers who stop smoking gain weight after they stop; on average 5 kg in the first year and about 6 to 7 kg overall. However, weight gain varies a lot between individuals, with some putting on 10 kg or more in a year. Although some factors predict who will gain excessive weight, they are not clinically useful for targeting individuals at high risk. Instead, it may be prudent to monitor weight gain after cessation and intervene with people gaining more than 1 kg/month. There is some evidence that weight gain after cessation can be prevented by dietary intervention that includes setting an energy intake goal and regular monitoring of weight and adjustment of energy intake. However, there are fears that such an approach may harm the success of a quit attempt because it may worsen craving for cigarettes. There is no evidence that this is the case, but the data are too imprecise to be completely reassuring. Exercise programs may reduce cravings for tobacco and increase the likelihood of achieving smoking abstinence, and there is some evidence that they reduce weight gain in the longer term. Consequently, they may be safely recommended but the effect on weight gain is modest. Long-term nicotine replacement therapy prevents several kilograms of weight gain but it may produce harmful metabolic changes that increase cardiovascular risk. Randomized trials are needed to assess efficacy. Thus, weight gain after cessation remains problematic with few interventions to prevent it that have only modest effectiveness.

Introduction Weight gain is a common consequence of stopping smoking but many experts in smoking cessation play this down and often advice is inaccurate. The aim of this article is to summarize the evidence for clinicians, making clear where there are uncertainties. It is based on Medline searches, examination of systematic reviews, a Cochrane review on preventing weight gain on smoking cessation, and clinical experience.

How much weight do quitters gain? A recent systematic review and meta-analysis showed that on average smokers gain about 4.7 kg during the first year of continuous abstinence.[1] However, the standard deviation is very large (4.7 kg) meaning a prediction of average weight gain will be wrong for most smokers. Around a quarter of smokers will gain less than a kilogram or lose weight on stopping, while another quarter will gain over 8 kg. The meta-analysis showed that mean weight gain is rapid in the first 3 months; about 1 kg per month, but the rate of gain slows down after that. However, cohort studies show that weight gain outstrips that of continuing smokers for several years after stopping smoking. These studies show that mean weight gain of clinic-treated abstinent smokers is about 7 kg more than that of continuing continuing smokers.[2,3] Some studies have suggested that weight gain is temporary, but this is derived from cross-sectional studies, and cohort studies show no evidence of this.

Most smokers make repeated attempts to stop smoking before achieving permanent abstinence, and there is a concern that repeated periods of abstinence could lead to incremental weight gain. Available data suggest that this does not happen and that resumption of smoking leads to loss of weight,[2,3] but data are insufficient to be totally reassuring.

Can we predict who will gain excessive weight? The most robust data we have on the extent of weight gain comes from cohort studies of clinic-

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-treated smokers, usually smokers enrolled in clinical trials. Their rigorous assessment of length of abstinence leads to more valid estimates of weight gain after cessation.[4] Most people who stop smoking do so without formal clinical support. These are typically less dependent smokers, and a systematic review found some evidence that lighter smokers gain less weight.[5] The review reported that the factor most consistently associated with lower weight gain is higher age at cessation.[5] There are contradictory data on whether women gain more weight, but even if weight gain is similar, this represents a greater percentage weight gain in women.[5] These characteristics, however, are very poorly predictive meaning that they cannot be used to pick a group at special risk for clinical intervention.[2] There is evidence from a twin study that weight gain on cessation is mediated genetically.[6]

Another factor associated with weight gain is past history of weight gain on stopping smoking, and it seems likely that this would be the most powerful predictor, but the data are insufficient to be sure.[7] In the absence of useful clinical markers, we suggest that monitoring weight gain and intervening early in people gaining more than the mean 1 kg/month would be appropriate, but this is based on common sense and not evidence.

Does worrying about weight gain or actually gaining weight reduce the success of a quit attempt? A survey showed that 84% of smokers are unwilling to accept a gain of more than 5 kg in body weight, and 28% are not prepared to accept any weight gain when they stop smoking.[8] However, there is inconsistent evidence that fear of weight gain or actual weight gain after quitting does in fact lead to relapse. Some studies show no association or associations only in one gender,[9,10] while others reveal that weight gain or fear of weight gain is associated with increased relapse,[11,12] or that weight gain is associated with a lower risk of relapse.[7,13] Methodological differences make it hard to draw a conclusion.

Weight concern often stems from unrealistic fears of the effect on appearance of modest weight gain.[14] Two trials addressed these fears with cognitive behavioral therapy.[14,15] Although the first was promising, showing an increased rate of abstinence, the second did not confirm this and a meta-analysis of both suggests that addressing worries about weight gain does not increase abstinence.[14,16] In clinical treatment, patients may bring up the issue and the clinician should respond appropriately, but no special treatment to address weight concern is helpful.

Does weight gain after cessation negate the health benefits of quitting? Smoking cessation is unequivocally effective at reducing the risk of future disease. This is the main reason why smokers stop, and they can be strongly reassured that the benefits of cessation outweigh the risk due to weight gain. A cohort study showed that on average, a person aged 40 years who stops smoking gains approximately 9 years of life compared with continued smoking.[17] On average, such a person will gain around 7 kg, a body mass index (BMI) increase of about 2.5 kg/m^2. A meta-analysis of cohort studies shows that a 2.5 kg/m^2 increase in BMI for anyone with a starting BMI >22 increases mortality by 14%,[18] while continued smoking increases it by 100%.[17] Furthermore, the 9-year increase in life expectancy following cessation at 40 years of age occurred despite the weight gain, so stopping without weight gain is likely to be associated with greater benefits than this.

That said, smoking cessation-related weight gain has adverse consequences. Two cohort studies showed that the incidence of type 2 diabetes is increased in the first few years after cessation, which is partly but not completely explained by weight gain.[19,20] Smoking cessation improves lung function in the first year after abstinence, and this benefit is not as great in those who put on most weight so efforts to reduce weight gain are likely to benefit the patient.[19,21]

Does smoking cessation medication reduce weight gain? A Cochrane review examining interventions to prevent post-cessation weight gain showed clear evidence that nicotine replacement therapy (NRT), varenicline, and bupropion (licensed medication for cessation) all reduce weight gain by about 0.5 to 1 kg during the period of medication use.[16] The data are insufficient to know whether the effect of the typical 2 to 3 months of treatment is permanent. However, data from observational studies show that smokers using NRT for a year or more put on several kilograms less than those who stop NRT.[22-24] In the United Kingdom, NRT is now licensed for lifetime use to reduce or stop smoking, opening the possibility that smokers might choose or be prescribed long-term NRT. Long-term use of nicotine may cause glucose intolerance or adverse changes in lipid metabolism. The data come mainly from short-term experiments and 1 case-control study of long-term users and they are not consistent.[25-30] Perhaps the most relevant data come from a cohort of snus users.[31] Snus is a form of moist tobacco that is left in the mouth; long-term use of snus is more prevalent than cigarette smoking in Swedish men. This study reported no greater prevalence and a somewhat lower incidence of diabetes for former smokers using snus than former smokers who stopped all tobacco. Until we have randomized trials of long-term use of NRT, it is not possible to recommend long-term NRT for all smokers worried about weight gain. Smokers and their physicians may need to weigh the reasonably strong evidence of modest benefit against the potential risks.

Is going on a diet when trying to quit smoking a good idea? Dieting while quitting could harm a quit attempt if it means a person goes hungry. There

is a close neurophysiological connection between urges to smoke and hunger and good evidence from short-term experiments that hunger is associated with higher urges to smoke and more intensive smoking.[32,33] Aside from this, some observational studies also suggest higher relapse risk in those who put on lowest weight,[7,13] although the evidence is inconsistent (see above). Consequently, many experts and guides for patients advise people not to go on a diet while trying to stop smoking.

Recent data challenge this prohibition. Very low-calorie diets typically ask users to abstain from all food and eat specially provided meal replacements, which leads to rapid weight loss. One high-quality randomized trial showed that going on such a diet while quitting smoking was associated both with lower hunger (perhaps because the ketotic state suppresses hunger), lower urges to smoke, and a 60% relative increase in abstinence.[34] There was suggestive evidence only of a long-term reduction on weight gain. However, experience in our clinic suggests few patients are prepared to accept this or stick to the diet.

Another dietary program that is associated with reduced weight gain is one in which the patient and clinician set a target for weight gain, set a calorie goal, and regularly monitor against the target. The Cochrane review found 3 such trials and the data showed reasonable evidence that those programs could prevent about 2.5 kg of weight gain at 1 year, though the estimate is imprecise. This treatment program is similar to the approach adopted by commercial weight-control program common in many developed countries. The costs to the patient of attending these program are relatively modest and they are available in the United Kingdom, for example, as part of national health service provision. Such programs have been shown to be effective in achieving weight loss in recent randomized controlled trials.[35,36] One concern about concurrent dieting is that the data are insufficient to exclude the possibility that calorie restriction reduces smoking abstinence, but there is no strong evidence that it does.

Is an exercise program while quitting helpful? While going hungry is associated with stronger urges to smoke, there is strong and convincing evidence from short-term laboratory studies that exercising reduces urges to smoke and smoking behavior in temporarily abstinent smokers.[37] However, a Cochrane review of randomized trials showed insufficient evidence that an exercise program itself increases long-term cessation success.[38]

The Cochrane review of preventing weight gain after smoking cessation included 3 trials of exercise programs. In all 3 programs, participants received regular supervised exercise as well as encouragement and behavioral support to increase physical activity at home. In the short term, these programs had no effect on weight gain, but by 1 year, people randomized to the programs gained 2 kg less than those not offered them. Given the discrepant and counter-intuitive findings, this could be a chance finding. However, supervised exercise programs are available "on prescription" for many general practitioners in the United Kingdom, and referral to these could be considered as a means of preventing weight gain on cessation.

Summary and recommendations Smokers should know that cessation leads to weight gain in 80% to 90% of individuals achieving abstinence, but it is more than 10 kg in only 10% to 20%. They also deserve to be told that it is permanent unless they make special efforts to prevent it or lose it again. Smokers should also know that smoking is about as harmful as morbid obesity (a BMI of more than 40 kg/m^2) and that the health benefits of cessation not only far outweigh the health risks of weight gain but occur in spite of these risks.

The old advice to quit smoking first and lose weight afterward is probably reasonable advice for many. However, losing weight is hard and only a minority will lose from 5 to 10 kg and sustain this, so regular weighing while quitting may well be helpful and intervention before excessive weight gain has accrued seems sensible. This entails waiting at least a month to monitor for weight gain, which is probably sensible in view of the possibility that dieting while quitting could harm the chance of attaining abstinence. If weight gain is more than 1 kg, then it may be sensible to encourage patients to take action before they have put on several more kilograms and weight loss becomes even more difficult. If this is a concern, physicians may consider encouraging patients to attend a weight-loss class that gives regular supervision and sets calorie goals and discuss the benefits. Physicians could also consider longer-term NRT use in people for whom weight gain is particularly hazardous, though this should be a second-line option.

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ARTYKUŁ POGLĄDOWY

Przyrost masy ciała związany z zaprzestaniem palenia tytoniu – jak postępować

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SŁOWA KLUCZOWE

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STRESZCZENIE

U około 80% osób, które zaprzestają palenia tytoniu, obserwuje się przyrost masy ciała średnio o 5 kg w pierwszym roku po zaprzestaniu palenia, a łącznie o około 6–7 kg. Jednak wielkość przyrostu masy ciała znacznie się różni między poszczególnymi osobami, z których część może przybrać na wadze nawet ≥10 kg rocznie. Chociaż niektóre czynniki pozwalają wskazać osoby narażone na nadmierny przyrost wagi, nie mają one klinicznego zastosowania w określeniu grupy wysokiego ryzyka. Zamiast tego, zasadnym wydaje się monitorowanie przyrostu wagi po zaprzestaniu palenia oraz interweniowanie w przypadku osób, u których przyrost ten wynosi >1 kg miesięcznie. Istnieją pewne dowody, że przyrostowi wagi po zaprzestaniu palenia można przeciwdziałać poprzez zastosowanie diety, która zakłada określoną podaż kalorii, regularne monitorowanie wagi ciała oraz dostosowywanie podaży kalorii. Są jednak obawy, że takie podejście może wpłynąć negatywnie na próbę podjęcia rzucenia palenia, ponieważ może zwiększyć potrzebę zapalenia papierosa. Nie ma na to co prawda dowodów, ale dostępne dane są zbyt nieprecyzyjne, żeby wyciągać jednoznaczne wnioski. Ćwiczenia fizyczne mogą zmniejszyć chęć zapalenia papierosa, zwiększyć szansę na wytrwanie w abstynencji; istnieją też pewne dowody, że w dłuższym okresie wpływają na obniżenie przyrostu masy ciała. Mogą być zatem rekomendowane, ale ich wpływ na przyrost masy ciała jest znikomy. Długoterminowa zastępcza terapia nikotynowa zapobiega przyrostowi wagi o kilka kilogramów, ale może wywołać szkodliwe zmiany w metabolizmie, które zwiększają ryzyko chorób sercowo-naczyniowych. Potrzebne są randomizowane badania kliniczne, które ocenią jej skuteczność. Podsumowując: problem przyrostu masy ciała po zaprzestaniu palenia wciąż pozostaje nierozwiązany; dostępne są nieliczne interwencje, które mogą zapobiec przyrostowi masy ciała, ale ich skuteczność jest niewielka.

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