

Increase in common cold symptoms and mouth ulcers following smoking cessation

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Abstract

Objective

To examine changes in common cold symptoms and mouth ulcers following smoking cessation. It was hypothesised that occurrence of these symptoms would increase on stopping smoking would predict relapses to smoking.

Design

A single cohort of smokers was assessed one week before stopping smoking (baseline), then after one, two and six weeks of smoking cessation.

Participants

174 smokers attending a seven week smoking cessation programme combining weekly behavioural support with nicotine replacement therapy.

Setting

Community-based smoking cessation clinic.

Main outcome measures

Self-reports of cold symptoms, mouth ulcers and smoking abstinence (validated using expired carbon monoxide) were recorded on each measurement occasion.

Results

Following one, two and six weeks of smoking abstinence 73.0% (127/174), 57.5% (100/174) and 44.8% (78/174) of the participants, respectively, maintained continuous abstinence and provided self-reports of cold symptoms and mouth ulcers. Relative to baseline, a significant increase in reports of cold symptoms was observed following one week of smoking abstinence ($p=0.007$) and an increase in reports of ulcers after one and two weeks of abstinence ($p=0.012$, $p=0.039$, respectively). The finding for increases in ulcers during the first week of stopping smoking predicting smoking relapses after two weeks of abstinence approached significance ($p=0.072$).

Conclusions

Smokers trying to stop need to be informed that they have an increased chance of experiencing a temporary increase in cold symptoms and mouth ulcers on stopping smoking. Being psychologically prepared for these effects may reduce their impact on the attempt to stop smoking.

What this paper adds:

Clinical observation indicates that some smokers experience an increase in common cold symptoms and aphthous (mouth) ulcers on stopping smoking. Anecdotal reports suggest that the discomfort associated with these symptoms may act as a deterrent to successful smoking cessation. Until now no study has systematically monitored changes in reports of mouth ulcers and cold symptoms on stopping smoking.

The results of this study indicate that smokers have an increased chance of experiencing cold symptoms during the first week, and an increase in mouth ulcers for up to two weeks, following abstinence from smoking. Neither increases in ulcers, nor increases in cold symptoms, were related to relapsing to smoking, although the finding for ulcers approached significance. These results confirm clinical observations of increases in colds and ulcers on stopping smoking and suggest that smokers who are preparing to stop should be informed of their increased susceptibility to these symptoms.

Introduction

The incidence of aphthous (mouth) ulcers has been found to be lower in smokers than in non-smokers [1] and clinical observation suggests that some smokers experience an increase in mouth ulcers on stopping smoking. Conversely, smokers tend to be more susceptible than non-smokers to developing common cold symptoms [2, 3], with clinical observations suggesting that some smokers experience an increase in cold symptoms on stopping smoking. In addition, anecdotal reports from smokers suggest that the discomfort associated with both mouth ulcers and cold symptoms may act as a deterrent to successful smoking cessation. To date, there has been no research systematically measuring changes in cold symptoms and mouth ulcers on stopping smoking. The present study aimed to examine changes in these symptoms through administering self-report measures both during smoking and then following smoking cessation.

Methods

Participants

One hundred and seventy four men and women wanting to stop smoking, aged 18 to 65 years and smoking at least 10 cigarettes a day for at least three years were recruited through newspaper advertisements across a twelve month period. Those with a psychiatric illness, substance misuse problem or pregnancy were excluded. The smokers provided written consent and ethics approval was obtained.

Design and measures

All participants were assessed one week before stopping smoking (baseline), and then after one, two and six weeks of smoking cessation. They attended six weekly smoking cessation treatment sessions involving individual cognitive-behavioural support [4] and a follow-up session two weeks after the final treatment. Participants were required

to cease smoking at the second session and were advised to use 15mg 16 hour nicotine patches on a daily basis [5, 6].

At the first session demographic data were collected. Self-reports of continuous smoking abstinence [7] following one, two and six weeks of abstinence were verified with expired carbon monoxide (CO, cut-off 10ppm) using a Bedfont Smokerlyzer and participants reported on their use of nicotine patches. At the first session, then following one, two and six weeks of smoking abstinence, those participants maintaining continuous abstinence were asked 'Have you had any of the following cold symptoms in the last week': sore/scratchy throat, cough, blocked-up nose, runny nose, sneezing, off-colour, fever, chill, head-ache, muscle-ache, catarrh, feeling of deafness/muzziness in ears, ear-ache and temperature [8]. For each smoker, scores were summed at each measurement point to produce a composite cold symptoms score (range=0-14). Additionally, participants were asked 'Have you had any mouth ulcers in the last week?'

Data analysis

All data were analysed using SPSS version 10. Changes in cold symptoms were examined using Wilcoxon tests. Changes in ulcers were assessed using pair-wise binomial tests. Logistic regression analyses was used to determine whether increases in symptoms predicted rates of smoking relapse. The association between changes in mouth ulcers and changes in cold symptoms was examined using a Spearman test. All statistical tests were two-tailed.

Results

The baseline characteristics of the sample are presented in table 1. Following one

week, two weeks and six weeks of smoking abstinence 73.0% (127/174), 57.5% (100/174) and 44.8% (78/174) of the participants, respectively, maintained continuous abstinence and provided self-reports for cold symptoms and mouth ulcers. Of those abstinent for one, two and six weeks 91.3% (116/127), 87.0% (87/100) and 65.4% (51/78), respectively, reported using nicotine patches on a daily basis.

Wilcoxon tests showed that significantly more cold symptoms were reported relative to baseline following one week of smoking abstinence ($Z=-2.7$, $p=0.007$, mean (SD) scores (range=0-14, $n=127$): baseline=1.5 (2.2), one week=2.2 (2.7), although not after two weeks of abstinence ($p=0.185$, mean (SD) scores ($n=100$): baseline=1.4 (2.1), one week=1.9 (2.7)), or six weeks of abstinence ($p=0.220$, mean (SD) scores ($n=78$): baseline=1.4 (2.1), one week=1.8 (2.9)). Following one week of abstinence, the most frequently reported cold symptoms were cough (28.3%, 36/127), runny nose (26.8%, 34/127), sneeze (26.0%, 33/127), sore/scratchy throat (25.2%, 32/127), and blocked nose (19.7%, 25/127). This is consistent with previous reports of symptom prevalence for the common cold in the general population [9].

The absolute percentage of the participants reporting mouth ulcers at baseline was 1.7% (3/174, 95% Confidence Interval (CI)=3.6%-4.9%). Pair-wise binomial tests showed a significant increase in reports of mouth ulcers relative to baseline following both one week of smoking abstinence ($p=0.012$; baseline=1.6%, 2/127, 95% CI=0.2%-5.6%; one week=13.4%, 17/127, 95% CI=7.5%-19%) and two weeks of abstinence ($p=0.039$; baseline=2.0%, 2/100, 95% CI=0.2%-7.0%; two weeks=9.0% (9/100), 95% CI=4.2%-16.4%), although not after six weeks of abstinence ($p=0.070$; baseline=1.3%, 1/78, 95% CI=0.03%-6.9%; six weeks=9.0%, 7/78, 95% CI=3.7%-17.6%).

There was no significant association between increase in mouth ulcers and

increase in cold symptoms between baseline and one week of smoking abstinence (point-biserial correlation coefficient=-0.101, $p=0.472$). Neither increases in cold symptoms nor increases in mouth ulcers following one week of smoking abstinence predicted smoking relapses at two weeks ($p=0.299$, 0.072 , respectively) or six weeks ($p=0.781$, 0.290 , respectively).

Discussion

This study provides evidence for there being an increase in cold symptoms following one week of smoking cessation and an increase in mouth ulcers for two weeks following cessation. The lack of an association between reports of cold symptoms and reports of mouth ulcers suggests that different mechanisms may underlie the effect of smoking cessation on these symptoms. One explanation for the observed increase in mouth ulcers following smoking cessation is the absence of the anti-bacterial effect of smoking [9]. The increase in reports of cold symptoms could be explained by a reduction in salivary immunoglobulin A levels on stopping smoking [10]. Studies are needed to investigate possible psychological and physiological mechanisms underlying the reported changes in symptoms after smoking cessation.

In the present study, since recruitment was staggered over a 12 month period, and since the increases in symptoms were only observed up to three weeks following the baseline measures, the chances of any effects being the result of seasonal variations were very small. Interestingly, when examining whether increases in ulcers predicted two weeks of smoking abstinence the finding approached significance ($p=0.072$, two-tailed). In order to adequately assess the impact of increases in ulcers and cold symptoms on rates of smoking abstinence further studies are required with larger sample sizes. Furthermore, it would be useful to assess the extent to which smokers

relate the occurrence of these symptoms to a smoking relapse.

The decreased sample size following two weeks and six weeks of smoking abstinence reduced the chance of detecting significant changes in cold symptoms and ulcers at these times. Further studies with larger sample sizes are needed in order to examine whether cold symptoms are elevated beyond one week of smoking abstinence and ulcers beyond two weeks of abstinence. In order to adequately control for seasonal variations a control group of continuing smokers would be required.

The results of this study have implications for the smoker who is trying to stop. Smokers need to be informed that they have an increased chance of experiencing a transient elevation in cold symptoms and mouth ulcers on stopping smoking. Being psychologically prepared for these effects is likely to mitigate their impact on the cessation attempt. Previously it has been shown that having realistic expectations of the consequences of medical interventions increases patient satisfaction and aids in decision making concerning treatment options [11,12].

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Table 1. - Baseline characteristics of the study sample (n=174)

Characteristic	Mean (SD)	95% CIs
Age (years)	43.2 (11.4)	41.5-44.9
Education (years)	13.0 (3.3)	12.5-13.5
Fagerström Test for Nicotine Dependence score	5.5 (2.0)	5.2-5.8
Smoking rate, cigarettes a day	21.3 (8.0)	20.1-22.5
Carbon monoxide level (ppm)	21.3 (9.0)	20.0-22.6
	Number (%)	
Female	108 (62.1)	54.9-69.3
Married	98 (56.3)	49.0-63.7
Professional/managerial	80 (46.0)	38.6-53.4
Caucasian	153 (87.9)	83.1-92.8

ppm=parts per million