

## BRIEF REPORTS

# Brief Smoking Cessation Intervention in Hospitalized Patients With Cardiovascular Disease

Laura Martínez García, Sergio Morchón Ramos, Cristina Masuet Aumatell, and Josep M. Ramon Torrell

Departamento de Medicina Preventiva, Hospital Universitari de Bellvitge, L'Hospitalet de Llobregat, Barcelona, Spain

The objective of this study was to determine the smoking abstinence rate after hospital discharge in cardiovascular patients who had undergone a brief smoking cessation intervention during hospitalization. The prospective cohort study involved 252 smokers who were admitted to the Hospital Universitari de Bellvitge in Catalonia, Spain. Twenty-four hours after hospital discharge, 76.6% of patients were still abstaining from smoking. At 1, 3, 9, and 12 months, the abstinence rate diminished to 71.4%, 67.2%, 64.1%, and 62.2%, respectively. Patients diagnosed with ischemic cardiopathy had a significantly lower probability of a smoking relapse: hazard ratio =0.56 (95% confidence interval, 0.36-0.87). At our center, a brief smoking cessation intervention in cardiovascular patients during hospital admission was found unlikely to result in smoking abstinence following discharge.

**Key words:** Smoking. Coronary heart disease. Peripheral vascular disease.

## Breve intervención de cesación tabáquica en enfermos cardiovasculares hospitalizados

El objetivo del estudio es estimar la tasa de abstinencia tabáquica posterior al alta hospitalaria en enfermos cardiovasculares que recibieron una intervención mínima de cesación tabáquica durante el ingreso. Se realizó un estudio prospectivo de una cohorte de 252 fumadores ingresados en el Hospital Universitari de Bellvitge. A las 24 h del alta hospitalaria se mantenía en abstinencia tabáquica el 76,6% de los pacientes. Tras 1, 3, 9 y 12 meses, las tasas de abstinencia habían disminuido al 71,4, el 67,2, el 64,1 y el 62,2%, respectivamente. Los pacientes diagnosticados de cardiopatía isquémica tenían menor probabilidad de recaída tabáquica: *hazard ratio* = 0,56 (intervalo de confianza del 95%, 0,36-0,87). En nuestro centro, una intervención mínima de cesación tabáquica durante la hospitalización en los enfermos cardiovasculares probablemente no sea suficiente para mantener la abstinencia tabáquica al alta.

**Palabras clave:** Tabaquismo. Enfermedad coronaria. Enfermedad vascular periférica.

## INTRODUCTION

Since 2000 the Hospital Universitari de Bellvitge (HUB; the Bellvitge University Hospital) has been part of the Xarxa Catalana d'Hospitals Lliures de Fum (XHLF; the Catalan Network of Smoke-Free Hospitals). Admission to an XHLF hospital brings together 3 circumstances that help initiate a period of abstinence from tobacco: disease, hospitalization, and a smoke-free environment.

Disease, especially if related to smoking, can increase a patient's motivation to quit.<sup>1</sup> Further, hospitalization increases a patient's self-perception of vulnerability, stimulating the autoassessment of health and lifestyle, and affords health professionals the opportunity to begin therapeutic interventions.<sup>2</sup> Beginning a smoking cessation treatment during a patient's hospitalization might therefore be effective.<sup>3</sup>

Recent data indicate that only 30.8% of patients who are hospitalized may actually be asked about their smoking habits.<sup>4</sup> The aim of the present work was to determine the rates of continued abstinence from smoking in patients admitted to the HUB for cardiovascular disease, all of whom were subject to a brief smoking cessation intervention during their hospitalization, at 1, 3, 9, and 12 months following discharge. Attempts were also made to identify the predictors of continued abstinence in these patients.

Correspondence: Dr S. Morchón Ramos.  
Unidad de Deshabitación Tabáquica. Servicio de Medicina Preventiva.  
Hospital Universitari de Bellvitge.  
Feixa Llarga, s/n. 08907 L'Hospitalet de Llobregat. Barcelona. España.  
E-mail: smorchon@bellvitgehospital.cat

Received February 29, 2008.

Accepted for publication June 4, 2008.

## METHODS

This prospective cohort study involved 252 patients admitted for cardiovascular disease to the cardiology or the angiology and vascular surgery units of the HUB (located in L'Hospitalet de Llobregat, Barcelona) between October 2003 and October 2005.

During hospitalization, patient demographic and tobacco consumption data were recorded in structured interviews. All data were collected by a trained nurse within the context of a medical assistance protocol. All patients were subjected to a 30 min-long behavior assessment, received written self-help information, and information from the HUB's Smoking Dehabilitation Unit.

Nicotine dependence was measured using the Fagerström test; a score of  $\geq 7$  was taken to indicate high dependence, 5-6 to indicate medium dependence, and  $\leq 4$  as low dependence. Patient baseline characteristics were stratified by the admitting unit. All were offered nicotine substitution therapy according to standard protocol.

Data regarding the continued abstinence from smoking following discharge were collected retrospectively via a telephone interview performed by a group of trained psychologists; these interviews took place between March and August 2006. The patients were asked about their tobacco consumption following discharge. Patients who declared themselves not to have smoked since leaving hospital were deemed to be abstinent; those who had taken up smoking once again were recorded as relapsed. The duration of abstinence was taken as the time between discharge from hospital and the date of relapse.

Qualitative variables were recorded as percentages and compared using the Pearson  $\chi^2$  test. Quantitative variables were recorded as means (standard deviation) if they met the criteria of normal distribution, or as medians (percentiles 25; 75) if they did not. Comparisons were made using the Student *t*

test for paired samples or the Mann Whitney *U* test as appropriate.

Smoking abstinence rates at 1, 3, 9, and 12 months after hospital discharge were estimated using the Kaplan-Meier method, and the log-rank test used to analyze the differences between survival curves. Those variables that showed a significant association with abstinence were entered into a Cox regression model to obtain hazard ratios (HR) and 95% confidence limits (95% CI). Significance was set at  $P \leq .05$ . All calculations were performed using SPSS v.12 software (SPSS Inc., Chicago, Illinois, USA).

## RESULTS

During the study period, 252 patients were subjected to the brief smoking cessation intervention described. After discharge from hospital, 38 (15.1%) of these patients could not be contacted via telephone after 4 attempts, and 22 (8.7%) had died. A total of 192 patients therefore made up the final study population, which included 176 men (91.7%) and 16 women (8.3%); the median age was 56 (47; 64.5) years.

Some 79.2% (152 patients) were hospitalized in the cardiology unit, and 20.8% (40) in the angiology and vascular surgery unit. Some 58.6% (112) were eventually discharged with a diagnosis of ischemic cardiomyopathy (acute myocardial infarction, angina, or acute coronary syndrome without elevation of the ST segment), 19.4% (37) with a diagnosis of peripheral vascular disease (acute/chronic ischemic syndrome of the extremities, venous thrombosis, or blue finger syndrome), and 22% (42) with a diagnosis of some other cardiovascular disease (precordial pain, heart failure, syncope, high blood pressure, arrhythmia, valve disease, or pericardial or aortic disease). At baseline 36.3% (49) smoked more than 30 cigarettes/day, 53.3% (72) waited no longer than 5 min to light their first cigarette of the day, and 53.3% (72) showed high nicotine dependence according to the Fagerström

**TABLE 1. Baseline Characteristics of the Patients—All Smokers—Depending on the Admitting Unit**

	Cardiology	Angiology and Vascular Surgery	<i>P</i>
Men, n (%)	137 (90.1)	39 (97.5)	NS
Age at admission, mean (SD), y	54.73 (11.83)	60.21 (10.33)	.008
Length of hospital stay, median ( $P_{25}; P_{75}$ ), d	11 (7; 14)	16.5 (10.25; 35.75)	<.001
Tobacco consumption, median ( $P_{25}; P_{75}$ ), cigarettes/d	20 (10; 40)	20 (10; 30)	NS
Nicotine dependence, median ( $P_{25}; P_{75}$ ), Fagerström test	7 (5; 8)	6.5 (4.25; 8)	NS
Total, n (%)	152 (79.2)	40 (20.8)	

NS indicates not significant; SD, standard deviation.

**TABLE 2. Rate of Abstinence From Smoking at 1, 3, 9, and 12 Months After Discharge From Hospital**

	1 Month, No. (%)	3 Months, No. (%)	9 Months, No. (%)	12 Months, No. (%)	P
Sex					
Men	124 (70.45)	117 (66.48)	108 (63.05)	89 (61.05)	NS
Women	13 (81.25)	12 (75)	12 (75)	12 (75)	
Age at admission					
<40 y	15 (78.95)	14 (73.68)	12 (68.02)	12 (68.02)	NS
40-50 y	32 (71.11)	29 (64.44)	29 (64.44)	26 (62.06)	
>50 y	90 (70.31)	86 (67.19)	80 (63.27)	62 (61.31)	
Diagnosis on discharge					
Ischemic cardiomyopathy	88 (75.86)	84 (72.41)	83 (71.55)	66 (69.48)	.019
Other cardiomyopathies	25 (65.79)	22 (57.89)	21 (55.26)	15 (51.81)	
Peripheral vascular disease	23 (62.16)	22 (59.46)	17 (48.5)	17 (48.5)	
Length of hospital stay					
≤10 d	58 (69.88)	55 (66.27)	54 (65.06)	37 (60.29)	NS
>10 d	79 (72.48)	74 (67.89)	68 (63.29)	68 (63.29)	
Tobacco use, cigarettes/d					
<10	11 (91.67)	9 (75)	9 (75)	9 (75)	NS
10-20	24 (70.59)	23 (67.65)	23 (67.65)	23 (67.65)	
>20	59 (66.29)	57 (64.04)	54 (60.67)	43 (59.3)	
Nicotine dependence					
Low	21 (77.78)	20 (74.07)	20 (74.07)	20 (74.07)	NS
Moderate	23 (63.89)	21 (58.33)	20 (55.56)	20 (55.56)	
High	50 (69.44)	48 (66.67)	46 (63.89)	34 (62.06)	
Total	137 (71.35)	129 (67.19)	120 (64.05)	97 (62.17)	

NS indicates not significant.

test. Table 1 shows the baseline characteristics of the patients.

Differences were seen in the age of hospitalization ( $P=.008$ ) and the length of time spent in hospital ( $P<.001$ ) depending on the admitting unit; patients admitted by the cardiology unit were younger and spent a shorter period in hospital. Tobacco consumption and nicotine dependency were similar in both admission groups ( $P=.56$  and  $.79$  respectively)

At 24 h post-discharge, 76.6% (147) of the patients remained abstinent from smoking. No significant differences were seen between the characteristics (Table 2) of the abstinent and non-abstinent patients at 24 h. Median follow-up time was 12 (0.43; 12) months. The abstinence rate decreased over the following year, from 71.35% at 1 month to 67.19%, 64.05%, and 62.17% at 3, 9, and 12 months respectively (Table 2). Differences in abstinence rates were seen between patients with different diagnoses on discharge ( $P=.019$ ); patients with ischemic cardiomyopathy showed the highest abstinence rates over the follow-up period (Figure).

The variables sex, age at hospitalization, and diagnosis at discharge were introduced into the Cox regression model to estimate the HR for abstinence from smoking. The patients diagnosed

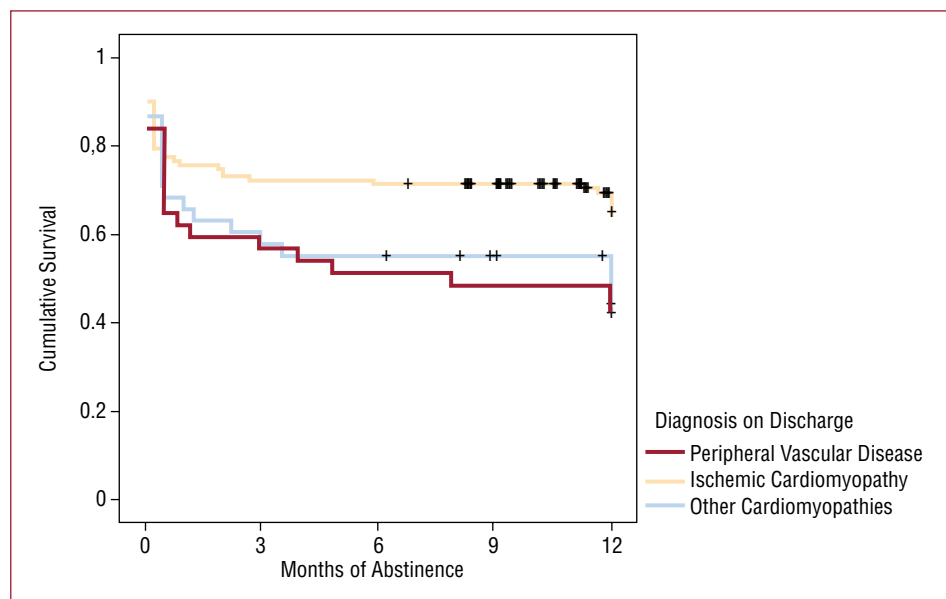
with ischemic cardiomyopathy were found to be 1.79 times less likely to take up smoking again compared to those with other diagnoses (HR=0.56; 95% CI, 0.36-0.87).

## DISCUSSION

The present work assesses the impact of a smoking cessation intervention provided to patients with cardiovascular disease—all smokers—during their time in hospital. None of these patients was subject to systematic follow-up after discharge.

The number of patients who remained abstinent following the intervention fell progressively over the experimental period. This agrees with the findings of Bolamn et al<sup>5</sup> and Hajek et al<sup>6</sup> who assessed the effect of a minimal smoking cessation intervention on patients with cardiovascular disease during their hospitalization period; these authors reported that the intervention had been unable to maintain abstinence from smoking at 12 months after discharge from hospital.

A Cochrane<sup>3</sup> review concludes that patients admitted for cardiovascular disease are more receptive to smoking cessation interventions, probably due to their perception of the seriousness of their condition. In the present study, the patients



**Figure 1.** Rate of continued abstinence from smoking according to diagnosis on discharge.

who maintained the highest abstinence rates were those with a diagnosis of ischemic cardiomyopathy. In fact, the only independent factor found to predict abstinence from smoking was this diagnosis.

The main limitation of this study is the use of patient-declared information, which could suffer some degree of systematic error or bias. Another weakness is the loss of participants during follow-up. Some of the other variables analyzed, eg, baseline tobacco consumption and nicotine dependence may have shown significant associations with abstinence had no such losses occurred. Finally, the study had no control group; the results cannot, therefore, be used to assess the effectiveness of the intervention on smoking cessation.

The absence of clearly effective smoking cessation treatments during hospitalization has led to research being promoted in this area, and a number of articles have now been published on the impact of different interventions and the factors that predict continued abstinence from smoking.

The experience gained at our center suggests that, for patients with cardiovascular disease, a minimum intervention during hospitalization is probably insufficient to maintain the abstinence rate recorded at discharge from hospital. Based on the results of Quist-Paulsen et al,<sup>7</sup> the impact of such a minimum intervention at our center might be best if resources were focused on patients in the cardiology unit with further input from the Smoking Dehabilitation Unit after discharge.<sup>8</sup>

## ACKNOWLEDGMENTS

The authors thank Gilma López Salguero, Taida Costa Català, Rocío López González, Rebeca Monterde Roldán, Silvia Salvador, and Antonio García Baena for their help in this work.

## REFERENCES

- Rigotti NA. Smoking cessation in hospital setting—a new opportunity for managed care. *Tob Control*. 2000;9:154-6.
- Sciamanna CN, Stillman FA, Hoch JS, Butler JH, Gass KG, Ford DE. Opportunities for improving inpatients smoking cessation programs: A community hospital experience. *Prev Med*. 2000;30:496-503.
- Rigotti NA, Munafo MR, Stead LF. Interventions for smoking cessation in hospitalised patients. *Cochrane Database System Rev*. 2007;(3):CD001837; doi: 10.1002/14651858.CD001837.pub2
- Nieva G, Gual A, Mondon S, Walter M, Saltó E. Evaluación de la intervención mínima en tabaquismo en el ámbito hospitalario. *Med Clin (Barc)*. 2007;128:730-2.
- Bolamn C, Vries H, Breukelen G. A minimal-contact intervention for cardiac inpatients: long-term effects on smoking cessation. *Prev Med*. 2002;35:181-92.
- Hajek P, Taylor TZ, Mills P. Brief intervention during hospital admission to help patients to give up smoking after myocardial infarction and bypass surgery: randomised controlled trial. *BMJ*. 2002;324:87-9.
- Quist-Paulsen P, Gallefoss F. Randomised controlled trial of smoking cessation intervention after admission for coronary heart disease. *BMJ*. 2003;327:1254-7.
- Morchón S, Blasco JA, Rovira A, Arias CN, Ramon JM. Efectividad de una intervención tabáquica en pacientes con patología cardiovascular. *Rev Esp Cardiol*. 2001;54:1271-6.