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Factors Related to Patient Smoking Status

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Abstract: To investigate those factors associated with patients' cigarette smoking status, 455 consecutive patients seen in two specialty clinics and one general medicine clinic at a university medical center were studied. Patient's age, sex, health status, and number of previous cessation attempts discriminated current from ex-smokers. A strong interaction was observed between sex and disease status with females showing a greater impact of smoking-related disease on smoking behavior than males. (*Am J Public Health* 1987;77:356–357.)

Introduction

Over the past several decades, there has been a decrease in the proportion of cigarette smokers in the United States population[1] although the percentage of heavier smokers has actually increased.[2] Thus, the public health consequences associated with smoking have not diminished proportionate to the decrease in the percentage of smokers. The present study was undertaken in part to determine the relationship of specific patient characteristics to patients' smoking status. The patient variables chosen are those which are readily available to a physician in his/her daily practice.

Methods

The study population consisted of 455 patients seen by 64 physicians in three clinic settings—primary care, cardiology and pulmonary—at a university medical center.

The primary source of data was a self-administered questionnaire assessing the patients' smoking status, age, sex, and smoking history. This questionnaire was administered over a two-month period to each adult patient seen in the clinics if the patient had been seen at least once before by the attending physician. In addition, information about patients' medical histories, including the presence of any smoking-related diseases or symptoms, was abstracted from the medical records of current and ex-smokers. Diseases were classified as smoking-related based on the directives given in the Surgeon General's 1979 Report on Smoking and Health.[3] Patients' self-reports of smoking status were used to separate the primary outcome comparison groups into smokers and ex-smokers.

The distribution of smoking status, medical diagnoses, and selected demographic characteristics was examined using the chi-square test for homogeneity of proportions and the t-test for continuous variables. A multiple logistic regression approach was used to examine which combination of variables might best distinguish between current and ex-smokers.

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TABLE 1—Distribution of Selected Characteristics Among Smokers and Ex-smokers

Characteristics	Smokers N	Smokers %	Ex-Smokers N	Ex-Smokers %	p-Value*
Age (years)					
<40	35	36	38	18	.005
40–49	18	18	22	11	
50–59	19	20	57	27	
60+	25	26	90	44	
Sex					
Male	43	44	130	63	.004
Female	54	56	77	37	
Cessation Attempts					
0	21	22	**	0	.000
1	16	17	64	39	
2	12	13	23	14	
3+	45	48	78	47	
Health Status					
Smoking-related disease	34	36	101	50	.053
Symptoms of smoking-related disease	26	28	36	18	
Neither disease nor symptom	34	36	66	32	
Cigarettes smoked per day					
<10	15	16	28	15	.676
10–19	19	20	29	15	
20–29	32	34	63	34	
30+	28	30	67	36	

*p-value for chi square test for homogeneity of proportions.
**Structural zero; p-value based on two degrees of freedom.

Results

The 455 patients included 97 (21 per cent) current cigarette smokers, 207 (46 per cent) ex-smokers, and 151 (33 per cent) never smokers. Table 1 provides summary statistics for comparisons of the distributions of sex, age, mean number of cigarettes smoked per day (for ex-smokers this was defined as the number they were smoking immediately prior to cessation), number of cessation attempts (for ex-smokers this was defined as the number of attempts before they last quit), and health status. The last variable included either smoking-related diseases; symptoms of a smoking-related disease; or neither. If a patient had both a smoking-related disease and symptoms of a smoking-related disease, he or she was placed in the diseased category.

Analyses of current as compared to ex-smokers indicate substantial differences according to age, sex, and number of cessation attempts, with health status of less importance. The most important factor within health status was the presence or absence of a smoking-related disease, with 36 per cent of smokers having a smoking-related disease as compared to 50 per cent of ex-smokers. Most current smokers were female (56 per cent) and most ex-smokers male (63 per cent).

To address the multivariate nature of the four variables (age, sex, number of cessation attempts, and health status) in relation to smoking status, a multiple logistic regression analysis was performed. Examination of interactions identified only one which significantly improved the model, a sex-disease interaction. Thus the final model shown in Table 2 contains four main effects and one interaction term. The

TABLE 2—Estimated Logistic Regression Coefficients Comparing Current Cigarette Smokers to Ex-smokers

Variables	Coefficient	Standard Error
Age	0.033	.009
Disease	1.012	.482
Cessation attempts	0.122	.135
Sex	1.684	.387
Sex × Disease	−1.926	.633
Constant	−2.099	.574

Overall significance of the model $p < 0.005$ $X^2 = 35.10^*$ d.f. = 5
*Likelihood rate chi square test of the model in this table versus a model only containing the constant term

TABLE 3—Estimated Relative Risk (RR) of Being an Ex-smoker, Controlling for Age and Disease

	Disease	
Sex	Present (1)	Absent (0)
Male (1)	2.2 (0.734, 6.353)	5.4 (1.592, 18.229)
Female (0)	2.8 (0.706, 10.719)	1.0

RR = Exp [1.684 × Sex + 1.012 × Disease − 1.926 × Sex × Disease].
NB: Figures in brackets show the 95% confidence intervals.

coefficients in Table 2 indicate that increasing age, the presence of disease, and being male increased the estimated probability of a person being an ex-smoker.

The coefficient for the sex-disease interaction was significant and negative, thus ameliorating the combined effect of the respective main effects. To illustrate this point, estimated odds ratios for the four combinations of sex and disease are shown in Table 3. Being female with an absence of disease is taken as the referent group. Given the presence of disease, males are less likely to be ex-smokers than females. The opposite is true among non-diseased patients. This is due to the strong interaction between sex and disease found in these data. Additional analyses were performed which compared males with and without smoking-related disease and females with and without smoking-related disease. These analyses showed that among both males and females, those with disease were significantly older but among females only those with disease had significantly more prior attempts to quit smoking.

Discussion

Although the outcomes of the present investigation may not be generalizable beyond the university clinic-based group studied, they support previous findings [4–9] that ex-smokers are older, include a higher proportion of males and more previous diagnoses of a smoking-related disease than do current smokers. Although the presence of a smoking-related disease had a substantial effect on smoking status, 36 per cent of the patients who had experienced such an event continued to smoke, thus reinforcing the need for additional work with this group of smokers.

The average number of cigarettes smoked by current smokers and by ex-smokers prior to their stopping smoking did not differ. This outcome is contrary to findings of previous studies[10] in which ex-smokers smoked significantly less than present smokers. Most of these studies did not include a smoking-related disease in their analyses, however. In two investigations of patients hospitalized with acute myocardial infarction, the smoking levels of ex-smokers and relapses or current smokers respectively were not significantly different.[9,11] These data suggest that once an individual develops a smoking-related disease his or her level of smoking may no longer be related to the likelihood of cessation.

In addition, the average smoker in the United States today is smoking more cigarettes per day than has been reported in past surveys.[6] With more heavy smokers, smoking level may be a less important factor related to cessation than it has been in the past.

These results also demonstrated a heretofore unreported strong interaction between sex and disease which ameliorated the strong positive associations of the main effects. The effect of the interaction indicated that in the presence of disease females were more likely than males to be ex-smokers. The greater number of previous attempts to quit among diseased females indicates a possibly greater motivation to quit in this group. The same is not true among males. This suggests that additional efforts must be made with males with smoking-related disease. Younger healthy female smokers continue to be elusive when it comes to smoking cessation.

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