

Original Article

Smoking among hospitalized patients in a general hospital*

Tabagismo em pacientes internados em um hospital geral

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Abstract

Objective: To determine the frequency of smoking among hospitalized patients in a general hospital, and to evaluate their profile. **Methods:** A random representative sample of 111 patients, classified as nonsmokers, former smokers or smokers, was evaluated. The smokers were submitted to the Fagerström test and measurement of expired carbon monoxide. Expired carbon monoxide higher than 6 ppm was considered a significant indicator of recent smoking. **Results:** Of the 111 patients in the sample, 60 (54%) were female. The mean age was 70 years. Of the 111 patients, 56 (51%) had never smoked, 36 (32%) were former smokers, and 19 (17%) were smokers. All of the smokers were male. The smokers were younger (58 ± 17 years) than the nonsmokers (68 ± 12 years) and the former smokers (73 ± 14 years)—ANOVA: $F = 6.57$ ($p = 0.002$). Among the smokers, the mean tobacco intake was 43 pack-years and the mean Fagerström score was 5.0. Of the 19 smokers, 11 (58%) had respiratory symptoms and 3 had withdrawal symptoms. The mean expired carbon monoxide in the smokers was 5.0 ppm. Expired carbon monoxide levels were higher than 6 ppm in 8 (42%) of the smokers. There was a higher prevalence of smokers in some wards: 70% of all smokers were hospitalized on only five wards. **Conclusions:** In a large tertiary hospital, 17% of the hospitalized patients were smokers, and 7% had smoked within the last 8 h. The smokers were younger men, hospitalized on specific wards.

Keywords: Smoking; Hospitalization; Carbon monoxide/diagnostic use.

Resumo

Objetivo: Determinar a frequência do tabagismo em pacientes internados em um hospital geral, e caracterizar o perfil dos fumantes hospitalizados. **Métodos:** Foi avaliada uma amostra representativa e aleatória de 111 pacientes internados, classificados como não-fumantes, ex-fumantes e fumantes. Nos fumantes foi aplicado o questionário de Fagerström e obtidas medidas de monóxido de carbono no ar expirado. Valores acima de 6 ppm de monóxido de carbono no ar expirado foram considerados significantes para tabagismo recente. **Resultados:** Dos 111 pacientes, 60 (54%) eram do sexo feminino. A média de idade foi de 70 anos. Do total, 56 pacientes (51%) nunca fumaram, 36 (32%) eram ex-fumantes e 19 (17%) eram fumantes atuais. Todos os fumantes eram do sexo masculino. Os fumantes tinham menor idade (58 ± 17 anos), em comparação aos não-fumantes (68 ± 14 anos) e ex-fumantes (73 ± 14 anos)—ANOVA: $F = 6,57$ ($p = 0,002$). A carga tabágica média dos fumantes foi de 43 anos-maço. A média do escore de Fagerström foi de 5,0. Dos 19 fumantes, 11 (58%) tinham sintomas respiratórios, e 3 tinham sintomas de abstinência. A média de monóxido de carbono no ar expirado dos fumantes foi 5,0 ppm. Oito (42%) dos fumantes tinham níveis de monóxido de carbono no ar expirado acima de 6 ppm. Houve maior prevalência de tabagistas em algumas clínicas: 70% dos fumantes se encontravam em apenas cinco enfermarias. **Conclusões:** Em um grande hospital terciário, 17% dos pacientes internados eram fumantes e destes 7% fumaram nas últimas 8 horas. Os fumantes eram pacientes mais jovens do sexo masculino, internados em determinadas clínicas.

Palavras-chave: Tabagismo; Hospitalização; Monóxido de carbono/uso diagnóstico.

Introduction

Smoking is a potentially curable chronic disease of epidemic proportions. In Brazil, 16.2% of the population smokes, and it is estimated that 200,000 deaths occur per year due to smoking-related diseases.^(1,2) Currently, approximately 50 diseases

are considered to be smoking-related, including neoplasms, pulmonary diseases and cardiovascular diseases. Presumably, smoking is common among hospitalized patients, although Brazilian national data on the matter are nonexistent.⁽³⁾

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In a large study conducted in a smoke-free hospital in the United States, the prevalence of active smoking among hospitalized patients was found to be 25%, and 55% of those patients reported withdrawal symptoms.⁽⁴⁾ In a general hospital in Portugal, the prevalence of active smoking among hospitalized patients was found to be 7.8%.⁽⁵⁾ It is also known that the incidence of smoking among hospitalized patients in smoke-free psychiatric hospitals is nearly 50%.⁽⁶⁾

Although most Brazilian hospitals are considered smoke-free environments, many patients are able to maintain cigarette consumption within these institutions.

Hospitalized patients are more receptive to anti-smoking messages, a fact that health care institutions should consider when planning smoking control measures aimed at hospitalized patients.⁽⁷⁾ The hospitalized smoker should be evaluated in terms of the motivational stage of change (level of readiness to quit smoking) and the degree of nicotine dependence. Guidance based on cognitive behavioral therapy for smoking cessation should always be provided, together with pharmacological treatment, when indicated.⁽⁸⁾ Therefore, a specialized technical staff is indispensable.

However, there are no protocols for treatment of hospitalized smokers in most Brazilian hospitals, and, in order to efficiently establish such protocols, more information is needed regarding the characteristics of the smoking habits of such patients.

The objective of this study was to determine, using clinical data and measurement of expired carbon monoxide, the frequency of smoking in patients hospitalized in a general hospital, as well as to characterize the profile of hospitalized smokers.

Methods

A cross-sectional study was conducted at the *Hospital do Servidor Público Estadual de São Paulo* (HSPE-SP, São Paulo Hospital for State Civil Servants), a tertiary public institution that provides medical assistance to civil servants working for the State of São Paulo, as well as to their first-degree relatives if enrolled. The hospital, responsible principally for highly complex treatments and hospitalizations, has 750 beds divided among 21 clinical and surgical specialties. There are approximately 2,600 admissions per month. The general hospi-

talized population of the HSPE-SP belongs to an advanced age bracket (mean age, 65 years), and most patients have multiple comorbidities, the characteristic profile being an elderly patient presenting considerable clinical severity. Since June of 2006, the HSPE-SP has been a smoke-free entity, in accordance with the Tobacco-Control Status Convention and to the directive no. 224/2006 of the Institute for the Treatment of Civil Servants, which forbids smoking in the interior of the hospital.

The sample was calculated in accordance with the World Health Organization guidelines.⁽⁹⁾ Therefore, it was composed of 110 patients so that the study would have statistical significance at the level of 5%. Of the total number of beds in the hospital, 16% were randomly selected using a computer program. The distribution of the beds selected was proportional to the distribution of beds among the 21 wards evaluated. The pediatrics and gynecology-obstetrics wards were excluded for technical reasons, as were the intensive care unit and coronary care unit. The decision to interview a calculated 16% of the total number of occupants (120 patients) was made bearing in mind occasional losses of patients who would not consent to participating in the study or who found themselves unable to do so.

The objectives of the study were explained to the participants, who then decided whether to participate or not. Written informed consent was given by all who agreed to allow their data to be used for research purposes.

A questionnaire was formulated. The questionnaire was designed to be completed during an interview with the selected patient and through later evaluation of the medical chart for confirmation and expansion of the data obtained. The interviews were conducted by two attending pulmonologists and two resident physicians in a single day (on March 18, 2007). The following data were collected: age; gender; reason for hospital admission; date and time of admission; ward on which the patient was hospitalized; and smoking status (smoker, former smoker or nonsmoker). Smokers were defined as individuals who smoked regularly (at least one cigarette per day), patients who had quit smoking at least one year prior were considered former smokers, and those who had never used tobacco-derived substances were considered nonsmokers.

If the patients reported being current smokers, they were asked to quantify their tobacco intake. In addition, the degree of nicotine dependence was determined using the Fagerström test,⁽¹⁰⁾ respiratory symptoms were characterized using a questionnaire derived from the 2006 Global Initiative for Chronic Obstructive Lung Disease⁽¹¹⁾; withdrawal symptoms were identified through application of a questionnaire used in the smoking laboratory of the HSPE-SP (Chart 1), modified from West et al.⁽¹²⁾; and expired carbon monoxide (COex) was measured using breath CO monitors (Micro Medical Ltd., Rochester, Kent, UK). A COex value above 6 ppm was considered a significant indicator of recent smoking.^(13,14)

Patients hospitalized for less than 8 h were excluded from the study due to possible interference with the results of the COex measurement.

Data obtained were analyzed using the Statistical Package for the Social Sciences, version 10.0 (SPSS Inc., Chicago, IL, USA). Descriptive statistical analysis was carried out, and the values are expressed as mean, median, standard deviation and variation. Qualitative variables were evaluated using the chi-square test, and quantitative variables were evaluated using analysis of variance (ANOVA). Correlations between and among variables were identified using the Pearson method. Values of $p < 0.05$ were considered statistically significant.

The study was approved by the Ethics in Human Research Committee of the HSPE-SP.

Results

The cross-sectional study was conducted on March 18, 2007, in the HSPE-SP and initially included 120 patients on 21 wards (16% of the total beds). Nine patients were excluded: 2 patients on the otorhinolaryngology ward for undergoing tracheostomy; 1 patient on the clinical neurology ward and 1 patient on the neurosurgery ward, both due to a drop in the level of consciousness; 1 patient on the pulmonology ward for being submitted to invasive mechanical ventilation; 2 patients on the general

Chart 1 – Withdrawal symptoms questionnaire.

Withdrawal symptoms:

Have you experienced any of the symptoms below during your hospital stay?

- Insomnia
- Irritability
- Anxiety
- Depression
- Increased appetite

Consider positive for withdrawal syndrome if any of the symptoms above are indicated

surgery ward for being unavailable at the time of the complementary examinations; and 2 patients on the psychiatric ward for refusing to participate in the study. All patients interviewed had been hospitalized for over 8 h.

The sample evaluated was composed of 111 patients and was predominantly (54%) female. As shown in Table 1, the mean age was 70 years (variation, 21-93 years). Of the 111 patients, 56 (51%) were nonsmokers, 36 (32%) were former smokers, and 19 (17%) were current smokers (Table 1).

The 19 current smokers were male, younger (58 ± 17 years) in comparison to nonsmokers (68 ± 12 years) and former smokers (73 ± 14 years)—ANOVA: $F = 6.57$ ($p = 0.002$); and had smoked for an average of 43 pack-years. The mean Fagerström score was 5.0 (variation, 1-8). Of the smokers, 11 (58%) presented respiratory symptoms, and 3 (15%) presented withdrawal symptoms. The median COex among the current smokers was 5.0 ppm (variation, 2-53 ppm). Of the 19 smokers, 8 (7% of the total sample) presented levels of COex ≥ 6 ppm (Table 2).

As can be seen in Figure 1, the level of COex correlated significantly with the Fagerström score ($r = 0.50$; $p = 0.029$).

The ward on which patients were hospitalized influenced the prevalence of smoking (Figure 2): the proportion of current smokers evaluated in the emergency room or on the pulmonology, vascular surgery, psychiatric or otorhinolaryngology wards was 70%, compared with only 8% for nonsmokers and former smokers ($\chi^2 = 18.78$; $p < 0.01$).

Table 1 – Patients classified according to smoking status.

Variable	Total	Nonsmoker	Former-smoker	Smoker	p
Gender, F/M	60/51	41/15	19/17	0/19	< 0.001
Age, mean \pm SD	67 \pm 15	68 \pm 12	73 \pm 14	58 \pm 17	< 0.002

Table 2 - Characteristics of hospitalized smokers.

Characteristic	Results	Minimum, n	Maximum, n
Pack-years	45 ± 37 ^a	1	160
Fagerström score	4.5 ± 2 ^a	1	8
Exhaled carbon monoxide, ppm	5	2	53
Respiratory symptoms, n (%)	11 (58%)	-	-
Withdrawal symptoms, n (%)	3 (15%)	-	-

^amedian ± SD.

Discussion

In the present study, the mean age was elevated (70 years), characterizing the geriatric profile of the population treated at the HSPE-SP. There was predominance of females in the sample, which can be a result of the greater proportion of women, in relation to men, in the over 60 age bracket in the general population.⁽¹⁵⁾

The prevalence of current smoking among the hospitalized patients was found to be 17%. Of the patients who smoked in the hospital, 15% reported withdrawal symptoms and 58% complained of respiratory symptoms. Similar data were obtained in another study,⁽⁴⁾ in which the evaluation of 650 hospitalized smokers revealed that 25% smoked during hospitalization, and that 55% reported at least one symptom attributable to the withdrawal syndrome. In contrast, in another study, no intense symptoms of withdrawal were observed in smokers hospitalized for elective surgery.⁽¹⁶⁾ We found no studies evaluating the frequency of respiratory symptoms in hospitalized smokers.

Through the COex evaluation, it was detected that 42% of the smokers, or 7% of the total sample, had smoked within the preceding 6 h. To detect

recent smoking, we used a cut-off point of 6 ppm, as suggested in a study in which this value was found to have a sensitivity of 77% and a specificity of 96%.⁽¹³⁾ It is known that environmental pollution, passive smoking and inflammatory pulmonary diseases such as asthma, bronchiectasis and primary ciliary dyskinesia can influence the results obtained, reaching values near 7 ppm. In the sample evaluated in this study, the influences of environmental pollution and passive smoking were excluded, since the patients had been hospitalized for more than 8 h. None of the interviewees reported having a history of any of the pulmonary diseases mentioned above. Measurement of COex using a portable monitor with an electrochemical sensor is a noninvasive method, of easy performance and low cost, in addition to being a good indicator for the biologic monitoring of smoking. Due to these characteristics, it is considered a good tool for the detection and monitoring of hospitalized smokers, although potential confounding factors should always be taken into consideration.

All 19 current smokers were male, and presented a mean tobacco intake of approximately 43 pack-years. Most of the smokers were hospitalized on the following wards: vascular surgery (17%); psychiatric (17%); pulmonology (12%); emergency room (12%); and otorhinolaryngology (12%). This finding can be explained by the higher incidence of smoking-related pulmonary, vascular and laryngeal diseases, as well as by the high prevalence of smoking itself, among psychiatric patients.

Current smokers were, as a group, younger than were former smokers and nonsmokers (Table 1). In the studies of samples in which there is a predominance of geriatric patients, greater proportions of former smokers and nonsmokers are commonly found.

The mean level of COex was low (mean, 5 ppm) in the smokers evaluated, since only approximately half presented levels equal to or higher than 6 ppm,

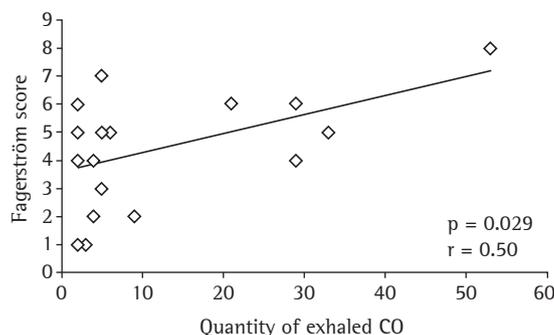


Figure 1 - Correlation between the level of exhaled carbon monoxide (CO) and the Fagerström score of smoking patients. The correlation was significant.

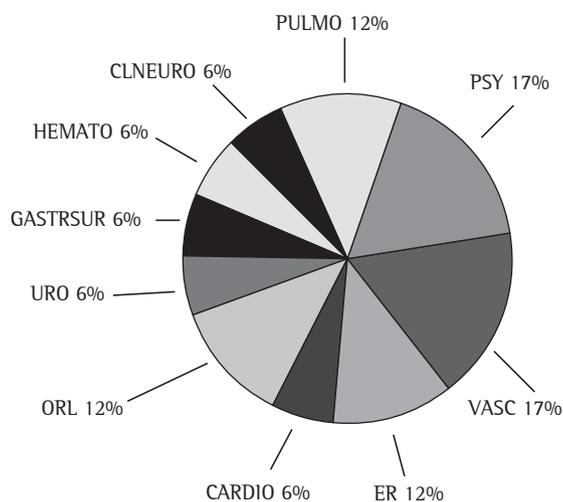


Figure 2 - Distribution of hospitalized smokers according to wards: psychiatry (PSY), vascular surgery (VASC), pulmonology (PULMO), emergency room (ER), otorhinolaryngology (ORL), cardiology (CARDIO), urology (URO), gastric surgery (GASTRSUR), hematology (HEMATO) and clinical neurology (CLNEURO).

showing that even those who continue smoking in the hospital environment alter their smoking pattern, by smoking less, a fact that should be valued as a possible aid in smoking cessation.

The mean degree of physical nicotine dependence in the sample of smokers (Fagerström score) was 4.5 (median, 5). However, 42% of the smokers presented elevated levels of COex, underscoring yet again the complexity of nicotine dependence influenced both by psychic factors and conditioning.

At admission, the smoking patient is exposed to different stimuli that facilitate or hamper smoking cessation. Although the stress of hospitalization and uncertainty concerning the treatment the patient will be submitted to hamper smoking cessation, the potential for forced abstinence in the hospital environment and worsening of disease facilitate cessation.⁽¹⁷⁾ These factors make hospitalization a favorable moment for anti-smoking interventions, and health care institutions should take advantage of this opportunity.⁽¹⁸⁾ The hospitalized smoker should initially receive information about the benefits of smoking cessation, with evaluation of the level of motivation to quit smoking and the degree of nicotine dependence, as well as receiving cognitive-behavioral therapy and pharmacological treatment,

if indicated.⁽¹⁹⁾ Orientation programs for hospitalized smokers present good cost-effectiveness ratios,⁽²⁰⁾ as long as they are conducted by a specialized and multidisciplinary staff.

In most hospitals, including the HSPE-SP, there are no protocols for smoking cessation intervention in hospitalized patients. Data for the 17% of the hospitalized patients who were smokers, 7% of whom, despite being in a theoretically smoke-free entity, had smoked in the preceding 6 h and 15% of whom reported withdrawal symptoms, show the urgency in instituting treatment protocols for this specific population.

The Brazilian National Cancer Institute/National Ministry of Health and the Brazilian Thoracic Association^(8,21) recommend that whether the patient is a smoker or not be registered at admission; if so, the pattern of tobacco use should be characterized and cognitive-behavioral therapy should be initiated, together with pharmacological treatment, if indicated, and the necessary referrals should be made in the interest of continuity of the treatment and maintaining abstinence after discharge. We also suggest that the patient be questioned about withdrawal symptoms, and, in addition, attention should be paid to subjective manifestations of the syndrome, in the form of insistence on being discharged and lack of cooperation with the treatment. We also suggest that the patient be informed about the prohibition against tobacco use in the hospital environment.

We evaluate the present study as having limitations since it was cross-sectional and did not take into account factors such as seasonal variations in the diseases. In addition, the status of self-described nonsmokers and former smokers was not confirmed objectively through the COex, which might have resulted in the underestimation of the prevalence of smoking in our sample. The low prevalence of smoking on the cardiology ward, which was contrary to expectations, is probably attributable to the exclusion of the patients in the coronary care unit.

In conclusion, there are hospitalized patients who smoke within the hospital, despite the existing ban. The proportion of smokers is higher on some specific wards, which would justify more rigorous care on those wards. Hospitalized smokers present withdrawal symptoms and should receive appropriate smoking cessation treatment.

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