Impact of coronary artery bypass graft surgery in smoking cessation

Impacto da cirurgia de revascularização do miocárdio na cessação do tabagismo

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Abstract

Background: Tobacco use is an important modifiable risk factor for cardiovascular disease. Few studies have investigated the frequency of smoking cessation among patients submitted to heart surgery.

Objective: To determine the frequency of smoking cessation in patients submitted to coronary artery bypass graft surgery.

Methods: In this cohort study, 203 consecutive patients, aged above 18, submitted to coronary artery bypass graft surgery in the period from January 2006 to March 2007, were interviewed in relation to the use of cigarettes in the pre- and postoperative period. Smokers were stratified according to the levels of nicotine dependence with the use of Fagerström Nicotine Dependence Test. They were followed as outpatients during 60 and 90 days for the occurrence of smoking.

Results: The mean age of the group was 62 ± 10 years, and 134 (66%) were male. Before surgery, 146 (71.9%) patients were smokers. A significant number of patients stopped smoking in the postoperative period: 136 (93.15%) and 137 (93.84%) on days 60 and 90, respectively, remained not smoking after surgery.

Conclusion: Coronary artery bypass graft surgery is an important determinant of smoking cessation.

Descriptors: Myocardial revascularization. Risk factors. Smoking.

Resumo

Fundamento: Tabagismo é um importante fator de risco modificável para doença cardiovascular. Poucos estudos têm investigado a frequência da cessação de fumar entre pacientes submetidos à doença cardíaca.

Objetivos: Determinar a frequência da cessação de fumar em pacientes submetidos à cirurgia de revascularização do miocárdio.

Métodos: Estudo de coorte, de 203 pacientes consecutivos, maiores de 18 anos, submetidos à cirurgia de revascularização do miocárdio no período de janeiro 2006 a março de 2007, quando foram entrevistados em relação ao uso de cigarros no período pré e pós-operatório. Fumantes foram estratificados de acordo com o grau de dependência com o uso do Teste de Dependência de Fagerström. Os pacientes foram seguidos durante 60 e 90 dias para avaliar uso de cigarros.

Resultados: A média de idade do grupo foi de 62 ± 10 anos, e 134 (66%) eram homens. Antes da cirurgia, 146 (71,9%) pacientes eram fumantes. Um número significativo de pacientes parou de fumar no período pós-operatório: 136 (93,15%) e 137 (93,84%), aos 60 e 90 dias, respectivamente, pararam de fumar depois da cirurgia.

Conclusão: Cirurgia de revascularização do miocárdio é um importante determinador para cessação de fumar.

Descritores: Revascularização miocárdica. Fatores de risco. Tabagismo.

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INTRODUCTION

Despite the anti-tobacco use campaigns, more than 1 in 10 cardiac patients died in the world in 2000 due to causes related to tobacco use, showing that it is an important cause of cardiovascular mortality [1]. Patients that kept on smoking after the coronary artery bypass graft surgery (CABGS) present higher risk of death than those patients ceased smoking. They are also submitted to procedures of revascularization more frequently [2]. In spite of these perspectives, quitting smoking is a challenge for many people. Although it is estimated that 70% of smokers worldwide would like to get rid of their addiction, only one third has success each year [3,4]. Several psychotherapy approaches, associated or not to pharmacologic treatments such as reposition of nicotine or bupropion, have been used, showing evidences of 10%-25% of efficiency in different clinical experiments [5]. It becomes a must to identify situations and strategies that can improve the efficiency of treatments for tobacco use. In all therapy approaches, cease smoking is one of the most crucial factors [6]. Crisis situations and events involving serious health risks, such as acute infarction of the myocardium, hospitalization, surgery and loss of relatives due to tobacco use related diseases, may represent an important motivation in order to cease smoking [7-14].

A limited number of studies have shown that CABGS in patients with ischemic disease represent a strong influence in order to cease smoking [15-18]. The factors involving these situations and the degree of nicotine addiction in this group of patients are not well understood. This study aimed to investigate the frequency of smoking cessation between patients submitted to CABGS.

METHODS

This prospective cohort analyzed 203 consecutive patients submitted to CABGS, between January, 2006 and March, 2007 (in the preoperative and postoperative periods), in three University Hospitals: Instituto de Cardiologia do Rio Grande do Sul (ICRS), Hospital de Clínicas de Porto Alegre (HCPA) and Irmandade Santa Casa de Misericórdia de Porto Alegre (ISCM). All adult patients, of both genders, and receiving medical care in each hospital. The professionals involved in the therapy procedures were not aware of the research project. There was no systematic approach for smoking cessation with these patients.

The study was approved by the Ethics Committee of the three hospitals involved. The patients that agreed to take part in this study signed up an agreement term. Patients were interviewed 60 and 90 days after CABGS regarding smoking cessation incidence. Further information was acquired through medical leaflets.

Patients operated in emergency or holding acute coronary syndrome or concomitant congenital heart disease and valve surgery were excluded from this study.

Research tools

Patients answered a questionnaire structured on demographic, anthropometric and clinical data. The Fagerström Nicotine Dependence Test (FNDT) [19,20] was created in 1978 and validated in Brazil by Carmo & Pueyo, being used to determine the degree of nicotine addiction [18]. The patients were rated according to the FNDT [19]. By using the FNDT, patients were stratified in three groups, according to the degree of nicotine dependence: a. very low and low; b. moderate; c. very high and high.

For analysis purposes, the patients stratified according to the degree of nicotine dependence by the Fagerström Test were allocated in three groups: a. very low and low degree; b. moderate degree; c. high and very high degree. The tobacco users were classified by the following criteria: a. present smoker (smoking from the date of surgery to one year earlier); b. in abstinence (smoking cessation from 1 to 20 years); c. ex-smokers (smoking cessation over 20 years); d. passive smokers (cohabiting with a smoker) [14,21]. The surgical risk was determined by a clinical risk score of the Cleveland Clinic [22].

Statistical analysis

The data collected were analyzed by the SPSS (*Statistical Package for the Social Sciences*) Program version 15.0. The categorical variables are presented by absolute frequencies and percentages and the continuous variables with normal distribution, by mean or standard deviation, whereas those without normal distribution, by mean and interquartilic amplitude (IQ).

In order to evaluate the demographic, anthropometric and clinical characteristics of the patients regarding smoking and complications, it was applied a Student's t test, for the continuous variables with symmetrical distribution, or the Mann-Whitney's test, for the variables with asymmetrical distribution, and the chi-square test or Fisher's exact test, for the categorical variables.

The logistic regression was used in order to control confusing factors and evaluate postoperative complication predictors.

The variables with $P \leq 0.20$ were used in the logistic regression model for the analysis of smoking associated with postoperative complicacies in 60 days.

In all analyses a value $P \leq 0.05$ was considered statistically significant.

RESULTS

Sample characteristics

There were selected 211 consecutive patients in the preoperative of CABGS. Eight patients were excluded for

not having undergone surgery for different reasons. The sample of the study, thus, consisted of 203 patients, being 134 (66%) male, with mean age 62 ± 10 years. Average income was US$ 340.00 (US$ 198.00 – US$ 592.00) and 146 (71.9%) patients were smokers.

General characteristics of the sample are presented on Table 1. The groups were different, for the smoking group presented lower age patients, higher number of male patients, tendency of higher income, cohabiting with tobacco users and educational background.

There was a significant cessation of smoking in the postoperative. Out of 146 smoking patients prior to surgery, only 10 (6.85%) and nine (6.16%) continued smoking after CABGS.

The general characteristics of these patients are presented in Table 2. Patients that continued smoking presented lower age and income.

Figure 1 shows the Fagerström classification, in which patients were rated prior to CABGS, in 60 and 90 days after CABGS. The percentage of smoking cessation was also analyzed in 60 and 90 days in the stratified group according to the degree of tobacco use addiction. An expressive cessation was observed in all groups. Considering the small number of patients that kept on smoking, it cannot be observed a correlation between the degree of addiction and cessation in the postoperative (Figure 1).

Table 1. Characteristics of smoking and non-smoking patients submitted to coronary artery bypass graft surgery.*

Characteristics	Smokers (n=146)	Non smokers (n=57)	P value
Age, mean , years	60.9 (10.1)	64.1 (9.2)	0.036
Gender			0.001
Men	107 (73.3)	27 (47.4)	
Women	39 (26.7)	30 (52.6)	
Educational background			0.420
≤ 8 years	111 (76.0)	48 (84.2)	
9 – 11 years	25 (17.1)	7 (12.3)	
> 11 years	10 (6.8)	2 (3.5)	
Cohabiting with a smoker			0.052
No	89 (61)	43 (75.4)	
Yes	57 (39)	14 (24.6)	
Hospitalization time (days) Mean (25 -75%)	8 (8 – 10)	9 (8 – 14)	0.223
Domestic monthly income in US Dollars			
Median (AIQ)	350 (175 – 550)	237 (175 – 412)	0.076
Mean (25 and 75%)			
Cleveland Clinic Risk Score – n (%)			
Low risk < 3	108 (74)	45 (78.9)	
Moderate risk 3 and 6	30 (2.5)	11 (19.3)	0.484
High risk > 6	8 (5.5)	1 (1.0)	

*Results are expressed in numbers (percentile), values are expressed as numbers (percentage), except other indications.
SD =Standard Deviation*

Table 2.   Characteristics of smoking patients submitted to coronary artery bypass graft surgery, stratified according to
tobacco use in 60 days.*

Characteristics	Smokers (n=10)	Patients that ceased smoking after CABGS CRM (n=136)	*P value*
Age, mean (SD), years	53.3 (6.6)	61.4 (10.1)	0.013
Gender			0.727
Men	7 (70)	100 (73.5)	
Women	3 (30)	36 (26.5)	
Educational background			0.667
≤ 8 years	8 (80)	103 (75.7)	
9 – 11 years	2 (20)	23 (16.9)	
> 11 years	0	10 (7.4)	
Number of cigarettes /day			0.749
≤ 20	8 (80)	95 (69.9)	
> 20	2 (20)	41 (30.1)	
Cohabiting with a smoker			0.189
No	4 (40)	85 (62.5)	
Yes	6 (60)	51 (37.5)	
Domestic monthly income (US Dollars)			
Mean	350 (300 – 850)	700 (350 – 1190)	0.070

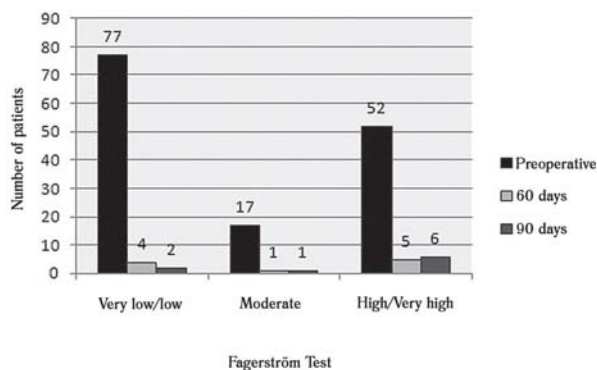*Results are expressed in numbers (percentile), except others. SD =Standard Deviation*

*Fig. 1 - Distribution of smoking patients, stratified according the
degree of tobacco addiction, during the preoperative period and
60 and 90 days after coronary artery bypass graft surgery*

DISCUSSION

This study showed that a large number of patients quit
smoking within 60 or 90 days after CABGS. This percentage
of smoking cessation, (93.15%) was higher than initially
expected. It was the highest result ever observed so far
with efficient behavioral and pharmacologic approaches
observed in different studies, in which the rates ranged
from 10%-25% [15–18]. Our results compared to those of
other studies showed high percentile of smoking cessation
in patients hospitalized for CABGS. Hilleman et al. [23]
studied a sample of patients submitted to CABGS and
observed that 85% quit smoking. Rigotti et al. [16] performed
a random controlled clinical study following patients
submitted to CABGS for a year and 94% of the patients
were followed up for a period of 5.5 years, in order to check
the efficiency of a smoking cessation program in patients
submitted to CABGS. The results showed that, even
without a specific intervention, almost half of the smoking
patients cease smoking, for five years, after heart surgery.

In this study there were not observed significant
differences between the different degrees of nicotine
dependence, in the behavior of ceasing tobacco use in the
postoperative. The number of patients that kept their
smoking habit was very low and, thus, that could not be
inferred as the degree of addiction shows correlation or
not with smoking cessation in the postoperative. Cavender
et al. [24] performed a random controlled clinical study, in
which the magnitude and the profile of nicotine dependence
among patients submitted to CABGS were determined by
the FNDT. According to the test and the patient's

preferences, it was set up a customized nicotine reposition treatment, with planned duration. The percentage of smoking cessation was not correlated with the degree of nicotine dependence.

The results observed in the present study could have different causes. Crisis situations, such as hospitalization, may motivate patients to quit smoking. CABGS is associated to a very high percentile of smoking cessation in a short period of follow-up. The hospitalization period and the follow-up of these patients can be used by a multidisciplinary crew in order to motivate them and their relatives to quit smoking.

The multidisciplinary crew could look after these patients during the hospitalization period, which could contribute during the postoperative period. The total results were positive for a large percentile of patients that quit smoking. This study suggests that smoking cessation programs may stimulate the cessation of tobacco use in the postoperative and its benefits in a long period of follow-up [15,18].

CONCLUSION

The coronary artery bypass graft surgery is an important determining factor for smoking cessation.

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