Original Article

Outpatient smoking cessation program in the state of Ceará, Brazil: patient profiles and factors associated with treatment success*

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ABSTRACT

Objective: To evaluate patient profiles and factors associated with successful treatment. **Methods:** A retrospective study of patients enrolled in the smoking cessation program at the Hospital de Messejana, located in the state of Ceará, Brazil, from October of 2002 to April of 2005. The treatment was evaluated based on patient profile, type of medication prescribed and time on that medication. **Results:** Of the 320 patients enrolled, 65.5% were women. The mean age at the outset of treatment was 48 years, and the mean duration of the smoking habit was 33 years. More than 90% of the patients had started smoking before the age of 20. Of the 258 individuals who had enrolled in the program at least one year prior, 50.8% had achieved treatment success; 17.8% had relapsed, and 31.4% had not quit smoking. On average, partial success was achieved in the fifth week of the treatment, and relapse occurred predominantly in the fourth month. Approximately 60% of the patients were treated with medication. **Conclusion:** Quitting smoking was significantly associated with the use of medication, regardless of the profile of the smoker evaluated. In the second year of the program, quitting smoking was more strongly associated with the use of bupropion and nicotine replacement, resulting in a higher success rate and a trend toward a reduction in the relapse rate.

Keywords: Smoking/therapy; Tobacco use cessation; Bupropion; Nicotine

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* Study conducted at the Outpatient Smoking Cessation Clinic of the Messejana Hospital, Fortaleza, Brazil.

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INTRODUCTION

The life expectancy of smokers is eight years shorter than that of nonsmokers. Smoking cessation, however, significantly reduces the mortality rate, as well as producing a number of health benefits, of those under 35 years of age, and, to a lesser degree, of those over 65 years of age, representing a cost-effective intervention.[1-2] Nevertheless, quitting smoking, in most cases, is not a simple and abrupt decision.

In 1992, the World Health Organization classified smoking as a mental and behavioral disorder, thereby revolutionizing the understanding of and approach to smokers, who were then no longer considered 'addicts'. The treatment began to include psychological and pharmacological aspects aimed at achieving and maintaining abstinence. The current treatment for smokers is distinct in that it combines the cognitive-behavioral approach with the use of anti-depressants, with or without nicotine replacement therapy (NRT).[1-2] Drug treatment has been shown to efficient and is well tolerated by patients.[3-4] The results obtained with NRT are similar, regardless of the delivery system employed: patches, nasal sprays, sublingual tablets or gum.[5] The chance of quitting smoking is doubled when bupropion is used and is even higher when bupropion is combined with NRT.[6]

This treatment plan was followed at the Outpatient Smoking Cessation Clinic of the Messejana Hospital and was modified over the course of the thirty-month program, based on the feedback received from the groups treated, with the purpose of raising the abstinence rate and avoiding relapse.

The objective of this study was to evaluate the profile of patients seeking outpatient care in order to quit smoking and to identify the factors associated with treatment success.

METHODS

This study was the result of the experience at the Outpatient Smoking Cessation Clinic of the Messejana Hospital from October of 2002 to April of 2005.

Patients who willingly expressed their desire to quit smoking were included in the program. After the initial contact, the patient was submitted to medical screening. A questionnaire (standardized by the Brazilian National Cancer Institute) was then filled out in order to evaluate the following: smoking profile; psychological profile; comorbidity; level of nicotine dependence, as characterized according to the Fagerstrom test for nicotine dependence (FTND) score (0-2 = very low, 3-4 = low, 5-6 = average, 7-8 = high, and 8-10 = very high); and motivation/preparation for the task of quitting smoking. In addition, a radiological assessment (chest X-ray or, when necessary, computerized tomography) was carried out, as was pulmonary function testing (spirometry).

After the diagnosis of nicotine dependence had been confirmed (FTND score) in a patient with a lung disease or other comorbidity, that patient, if demonstrating the desire and aptitude for individual participation in a group dynamic, was referred to a support group for cognitive-behavioral therapy sessions. These two-hour sessions were presided over by two facilitators, who, in addition to discussing aspects of nicotine dependence and abstinence, coordinated experiences to promote self-knowledge of nicotine dependence and behavioral changes on the part of the patients, with the objective of achieving abstinence.

The decision as to whether or not to treat patients with drugs (antidepressants or supplementary nicotine), complementary therapy (acupuncture), or both was based on screening data and on patient evolution during the sessions.

During the first six months of the program, the distribution of the medication was irregular. During the first sixteen months of the outpatient program, the maintenance treatment was based on the evaluations made in the monthly visits. From months nineteen to twenty-two, follow-up evaluations were made every fifteen days, after which the once-a-month schedule was resumed (for the final nine months of the program).

Abstinence was defined according to information provided by the patient. Treatment outcomes were defined as follows: treatment success, as smoking cessation for a period equal to or greater than twelve months; partial treatment success, as smoking cessation for a period of less than twelve months; relapse, as the resumption of smoking at any time during treatment; treatment failure, as smoking persistence despite treatment; and treatment abandonment, as dropping out of the program.

In order to facilitate the evaluation of the profile of patients and factors associated with abstinence over the course of the program, the patients were divided into three groups: group I (comprised of those joining the program between October of 2002 and November of 2003); group II (those joining between February of 2004 and January of 2005); and group III (those joining between February and April of 2005).

In order to characterize the profile of the outpatients, the following variables were assessed: gender; age at which the smoking habit was taken up; duration of the smoking habit; number of cigarettes smoked by gender; number of previous attempts to quit smoking; age at the initiation of treatment; and FTND score.

To identify factors associated with treatment success, the following parameters were evaluated: year of inclusion in the program; age at which the patient started smoking; duration of the smoking habit; age at which treatment was initiated; FTND score; type and duration of treatment; and the use of complementary therapy (acupuncture). To evaluate the treatment, only the data from groups I and II were considered, since they included patients who had quit smoking for at least one year, the time period established as necessary for characterizing treatment success and relapse.

The study design was approved by the Messejana Hospital Committee for Ethics and Research in Humans. Data were obtained through the analysis of a questionnaire used by the National Cancer Institute, which was adapted to the local circumstances and was applied by pulmonology residents.

Abstinence was defined based on the information provided by the patient. Partial treatment success was defined as smoking cessation for a period of less than twelve months. Statistical analysis was conducted through the use of descriptive analyses, the chi-square test and Pearson's test, as well as Fisher's exact test for the analysis of associations in contingency tables. When an association was found between two variables, the relative risk (RR) and 95% confidence interval (95% CI) were estimated. Student's t-test was used to compare means for independent populations when the distribution of data was normal. In the case of non-normal distribution, the Mann-Whitney test was used. For comparison of the means of three or more independent populations, the ANOVA method was used for normally distributed data; in the case of non-normal distribution, the Kruskal-Wallis test was used.

RESULTS

In total, 320 patients who sought treatment for at the Outpatient Smoking Cessation Clinic were evaluated and distributed into three groups (I, II and III) depending on the time at which they enrolled in the program. Of those 320 patients, 210 (65.5%) were women. Over the course of the study period, the number of men seeking treatment at the outpatient clinic began to increase (from 25% in the group I period to 38.6% in the group II period and 38.7% in the group III period), and the increase from the first to the second period was significant ($p < 0.05$). The mean age at the outset of treatment was 48.47 ± 10.5 years. The majority began smoking before the age of 20 (15.43 ± 4.3), and the mean duration of the smoking habit was 33 years. More than 50% smoked over twenty cigarettes per day and had attempted to quit smoking more than once. Women tended to smoke fewer cigarettes than did men. Approximately 78% of the patients presented moderate or serious dependence, scoring at least 5 on the FTND (Table 1).

In order to evaluate the result of the treatment, only the first two groups were studied, since they both consisted of patients who had been enrolled in the program for at least twelve months. In the group I and II patients as a whole, treatment success was achieved in 50.8%, relapse occurred in 17.8%, and

TABLE 1

Profile of the patients at the Outpatient Smoking Cessation Clinic at the Messejana Hospital

	n = 320
Age at outset of treatment in years	48.47 ± 10.5
Gender	
Male n(%)	110 (34.4%)
Female n(%)	210 (65.6%)
Men smoking < 20 cigarettes/day n (%)	38 (34%)
Women smoking < 20 cigarettes/day n (%)	101 (48%)
FTND score ≥ 5 (moderate to severe dependence)	248 (77.6%)
Smoking more than 20 cigarettes/day n (%)	174 (54.4%)
Mean duration of smoking in years	32.9 ± 11.27
Mean initiation of smoking in years	15.4 ± 4.3
More than one prior attempt to quit smoking n (%)	157(50.3 %)

TABLE 2

Outcomes for patients treated in the first and second years of operation of the Outpatient Smoking Cessation Program at the Messejana Hospital

Outcome	No. of cases	%
Treatment success	131	50.8
Relapse	46	17.8
Treatment failure	51	19.8
Treatment Abandonment	30	11.6
Total	258	100.0

treatment failure or abandonment was observed in 31.4% (Table 2). Partial success was achieved, on average, in the fifth week of treatment, and relapse occurred at a mean of four months (Table 3).

Within the first three months, bupropion was used in 67.6% of the cases and the nicotine patch in 54.9%. Quitting smoking was definitively associated with the isolated use of medication (bupropion alone or the patch alone) ($p < 0.001$) (Table 4), and did not present any difference in relation to the smoker profile.

In the third period, partial success was achieved in 56.7% of the patients. With regard to the chances of a patient quitting smoking temporarily after enrolling in the program, it was significant for those who used antidepressants or patches for a mean period of three months. Relapse was more common among those who required complementary therapy. Comparing the first two periods, it was observed that antidepressant medication was used less frequently in isolation during the second period than during the first (RR = 0.237; 95% CI: 0.115-0.49). In the second period, the combination of bupropion and the nicotine patch was more frequently used (RR = 1.592; 95% CI: 1.142-2.220), the rate of treatment success was significantly higher (RR = 1.389; 95% CI: 1.059-1.820), and there was a trend toward a reduction in the relapse rate (RR = 0.633; 95% CI: 0.376-1.000) (Table 5).

DISCUSSION

Some authors have facilitated the understanding of the process of quitting smoking through the definition of the stages of change, from the pre-contemplation period to the time of the act itself. During the first interview, one of the criteria used

TABLE 3

Comparison of the groups under treatment in the first, second and third periods, with the distribution of the quantitative variables

Variable	Treatment period	N	Mean	SD	p
Age at outset of treatment	period 1	100	47.66	10.84	0.082*
	period 2	157	48.01	10.95	
	period 3	61	50.97	8.41	
Age smoking habit began	period 1	100	15.25	4.48	0.474*
	period 2	156	15.54	4.05	
	period 3	62	15.44	4.85	
Duration of smoking habit (years)	period 1	100	32.41	11.66	0.076*
	period 2	156	32.58	11.45	
	period 3	61	35.77	8.03	
FTND score	period 1	99	5.72	2.21	0.013*
	period 2	157	6.31	2.30	
	period 3	61	6.82	1.90	
Time (in weeks) to partial success*	period 1	59	5.14	4.31	0.156**
	period 2	112	5.11	3.57	
Duration (months) of bupropion use	period 1	54	2.15	2.09	0.008**
	period 2	85	2.35	1.16	
Duration of NRT use	period 1	41	3.05	2.35	0.488**
	period 2	100	2.48	1.14	
Time (in months) to relapse	period 1	20	4.80	2.53	0.145**
	period 2	18	3.61	1.75	

* Kruskal-Wallis test; **Mann-Whitney test; SD: standard deviation; FTND: Fagerstrom test for nicotine dependence; NRT: nicotine replacement therapy (patch)

TABLE 4

Analysis of factors associated with treatment outcome (therapy success)

Variables		Total	Outcome		p	RR	95% CI	
			Success	Failure			LL	UL
Used medication								
No	n	81	12	69	<0.001			
	%	100.0%	14.8%	85.2%		1.000		
Bupropion only	n	33	25	8				
	%	100.0%	75.8%	24.2%		5.114	2.931	8.923
NRT only	n	35	25	10				
	%	100.0%	71.4%	28.6%		4.821	2.747	8.463
Bupropion and NRT	n	109	69	40				
	%	100.0%	63.3%	36.7%		4.273	2.487	7.343
Used bupropion								
No	n	116	37	79	<0.001			
	%	100.0%	31.9%	68.1%		1.000		
Yes	n	142	94	48				
	%	100.0%	66.2%	33.8%		2.075	1.552	2.776
Duration of bupropion use (in months)								
≤ 3 months	n	96	63	33	0.699			
	%	100.0%	65.6%	34.4%				
≥ 3 months	n	43	30	13				
	%	100.0%	69.8%	30.2%				
Used NRT								
No	n	114	37	77	<0.001			
	%	100.0%	32.5%	67.5%		1.000		
Yes	n	144	94	50				
	%	100.0%	65.3%	34.7%		2.011	1.504	2.689
Duration of NRT use (in months)								
≤ 3 months	n	79	54	25	0.720			
	%	100.0%	68.4%	31.6%				
≥ 3 months	n	62	40	22				
	%	100.0%	64.5%	35.5%				
Complementary treatment								
No	n	221	114	107	0.596			
	%	100.0%	51.6%	48.4%				
Yes	n	37	17	20				
	%	100.0%	45.9%	54.1%				

RR: relative risk; 95% CI: 95% confidence interval; LL: lower limit; UL: upper limit; NRT: nicotine replacement therapy (patch)

to determine which candidates for treatment are the most committed to the goal is being in the stage of preparation for the act, which is defined as seriously intending to quit smoking within a one-month period.[2]

In the present study, these types of patients, as well as former smokers in need of support to remain abstinent, were given priority in the selection process. Patients wishing to quit smoking within a greater than one-month period were encouraged to make the transition to the next stage of the process and to seek treatment at the outpatient clinic at a more appropriate time.

As in other studies,[4] the profiling of smokers who sought treatment at our outpatient clinic showed that the majority (92%) began smoking during adolescence. In addition, our patients had smoked for an average of 33 years prior to seeking treatment, which occurred, on average, at the age of 48. Furthermore, over 50% smoked more than twenty cigarettes a day and had attempted to quit smoking more than once.

Within our study sample, there was a predominance of middle-aged women, which was

TABLE 5

Estimate of relative risk of quitting smoking; using group II as risk, of patients treated in the second year of operation of the Outpatient Smoking Cessation Program at the Messejana Hospital

	RR	95% CI	
		LI	UL
Use of medication			
No	0.832	0.580	1.190
Bupropion only	0.237	0.115	0.490
NRT only	1.582	0.794	3.150
Bupropion and NRT	1.592	1.142	2.220
Use of NRT	1.590	1.224	2.065
Other treatment	2.317	1.263	4.250
Outcome			
Treatment Success	1.389	1.059	1.820
Relapse	0.633	0.376	1.000
Treatment failure	0.791	0.552	1.130

RR: relative risk; 95% CI: 95% confidence interval; LL: lower limit; UL: upper limit; NRT: nicotine replacement therapy (patch)

initially justified by the greater amount of time they were able to dedicate to the treatment. Men had difficulty leaving work. However, from the first to the second period, an interesting phenomenon was observed: there was a significant increase in the number of male patients seeking treatment (from 25% to 38.6%). Women smoked fewer cigarettes than did men, and, since there were more women than men in the study, this was reflected in the degree of nicotine dependence, as determined using the FTND test, which was found to be moderate in 47% of the patients.

The treatment of smoking is founded in the cognitive-behavioral approach and drug treatment.[1-6] A review of the literature shows that using this approach is an efficient means of treating smokers,[7] and that it cannot be replaced by treatment with medication alone.[2]

In the assessment of the result of the treatment of smokers one year after the introduction of antidepressants and NRT, it has been observed that the success rate is only twice as high as that obtained with the use of placebos (20%-30% vs. 10%-15%), regardless of the therapy.[1] In the present study, in which two drugs were used, the rate of abstinence (defined as smoking cessation for a minimum of twelve months) was 50%. Partial success was achieved in 67% of the cases, relapse occurred in 17.8%, and treatment failure/abandonment was seen in 31.4%.

To provide relief from the symptoms of abstinence, specifically the craving, associated with nicotine withdrawal, NRT, which comes in the form of patches, gums, nasal sprays and sublingual tablets, can be used.[1-2,5,8-9] Although a review of 123 articles demonstrated that NRT provides favorable results, irrespective of the formulation (RR = 1.77; 95% CI: 1.66-1.88),[5] other authors have shown that the patch is more effective for reducing nicotine dependence, since it maintains the level of nicotine in the blood for a period of 16 to 24 h.[1]

To date, the program evaluated in the present study has only employed the nicotine patch form of NRT, which was used by 54.9% of the patients for a period of up to three months. The NRT was combined with an antidepressant in 42% of the patients. It is important to mention the fact that, for bureaucratic reasons, the program did not adequately make the patch available during the first six months, which might explain the low abstinence rate in the first year.

A great number of antidepressants have been used during tobacco abstinence, since nicotine withdrawal can trigger depressive symptoms or episodes of major depression. In March of 2004, the Cochrane Collaboration carried out a systematic review of randomized studies and showed that the use of monoamine oxidase inhibitors, venlafaxine, fluoxetine and paroxetine provided no benefits in the treatment of smokers. In contrast, the isolated use of bupropion or nortriptyline doubled the rate of smoking cessation (RR = 2.06; 95% CI: 1.77-2.40; and RR = 2.79; 95% CI: 1.70-4.59, respectively).[1,5-6,10]

In the present study, only bupropion was prescribed. Bupropion was used by 67.6% of the patients for a minimum of three months, and this group presented a two-fold greater chance of quitting smoking. Overall, only 12.8% of the patients used bupropion alone, whereas 42% used bupropion in combination with nicotine patches.

Of the factors evaluated in this study, the ones presenting no statistically significant association with treatment success were gender, degree of nicotine dependence and the number of cigarettes smoked. In patients who had previously attempted to quit smoking, there was a tendency toward treatment success. Of the total sample, 63.3% achieved abstinence using the combination of NRT and an antidepressant ($p < 0.01$). A significant degree of treatment success was also achieved in those

who used bupropion alone or NRT alone (66.2% and 63.5%, respectively).

With regard to the period of treatment with medication, bupropion was extended until three months in 65.5% of the cases and NRT in 68.4% of the time. Treatment failure was significantly associated with the non-use of medication ($p < 0.001$), whether bupropion (61.2%) or the nicotine patch (60.5%).

Relapse was significantly associated with the need to use complementary forms of treatment (acupuncture or one-on-one psychological treatment) ($p = 0.006$), suggesting that individuals with greater psychological dependence experienced more frequent relapses.

In this study, comparing the first two periods, it was observed that, in the second period, the patients used less antidepressant medication in isolation. Since the patches were consistently available during the second period, the combination of bupropion and the nicotine patch was more frequently used. This modification helped to increase the abstinence rate and reduce the relapse rate, both significantly. Partial and total treatment success were associated with the use of medication (bupropion alone or the patch alone) and presented no difference related to the profile of the smokers evaluated in this protocol.

The better results obtained in the second period were attributed to some changes to the structure of the group sessions of the cognitive-behavioral approach, and to the greater availability of the medication. New experiences and statements from former smokers were introduced with the purpose of encouraging reflection regarding self-knowledge of the dependence, the search for personal resources in order to face difficulties, behavioral changes and the creation of strategies for the avoidance of relapse.

Another interesting aspect to consider is the ideal duration of treatment. The duration of standard medication treatment, three months, may not suffice for those patients presenting a high level of dependence and concerned with weight gain, which is an important risk factor for relapse.[11-14] Studies have shown that prolonged drug treatment is not harmful to the health when compared with the risks of smoking. However, it is still necessary to clearly define the type of medication prescribed and the population that will benefit from such a strategy.[4] This fact might have influenced our results, since the success rate was higher among those individuals under drug treatment for over three months, regardless of the drug, as well as since relapse predominantly occurred in the fourth month and was more common among those who required complementary therapy. Therefore, we currently tend to prolong drug treatment for patients with more severe nicotine dependence.

The 2005 U.S. Public Health Service Guideline recommendations define the combination of an antidepressant and NRT as standard treatment for smokers, since it is more effective than NRT alone and each treatment involves a different pharmacological mechanism. In addition, the prolonged use of an antidepressant has been shown to be useful in reducing relapse rates.[15] Despite the effectiveness of this medication, it is only effective for a fraction of smokers, which gave rise to a new direction for research into the ideal treatment for smokers. Pharmacogenetic studies have explored how genetic variations alter the metabolism of drugs and consequently the therapeutic response. Once the genotype has been identified, it would be possible to identify the type, dosage and duration of treatment.

With regard to the complementary treatment, the Cochrane Collaboration review of randomized studies showed that neither acupuncture, laser therapy or electrostimulation were efficient in achieving smoking cessation.[16] In our patients, acupuncture reduced anxiety levels, although it did not alter the success rate.

Based on the results of the present study, and with the objectives of increasing the rapport between the group and the facilitators, raising the abstinence rate and reducing the number of patients abandoning the program, as of February of 2005, an outpatient program was created with follow-up visits every fifteen days, carried out by the same team which initially treated the group. Another outpatient program was created in order to treat patients with difficulty quitting smoking and experiencing relapses.

It was concluded that, as to the profile of the patient of the Outpatient Smoking Cessation Program, females were predominant (65.5%), that the mean ages to start smoking and treatment were 15.4 and 48.47 years, respectively, and that the mean duration of the smoking habit was 33 years. Over 50% of the patients smoked more than twenty cigarettes a day and had attempted to quit smoking more than once. A moderate degree of nicotine dependence prevailed in 78% of the patients. In

relation to the factors associated with tobacco use cessation, having previously attempted to quit smoking presented a tendency toward treatment success. The chance of quitting smoking was significantly greater ($p < 0.001$) with the use of medication, whether bupropion or NRT, and did not present any difference with regard to the profile of the smokers evaluated in the present study. Comparing the first two periods, it was observed that, in the second, patients more often used the combination of bupropion and NRT. The chance of treatment success also increased significantly in the second period, tending toward a reduction in the relapse rate. Treatment failure was significantly associated with using no medication. The relapse rate was significantly higher in the group requiring complementary therapy and occurred most frequently in the fourth month of treatment.

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