



Continuous Abstinence Rates at 3, 6, 9 and 12 Months in a Smoking Cessation Unit at the Albacete University Hospital Over 2 Years

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Abstract

Introduction: Review the continuous abstinence rates at 3, 6, 9 and 12 months obtained in a Smoking Cessation Unit (SCU) over 2 years.

Methods: Retrospective descriptive analysis of the results obtained from 559 patients attended to in an SCU from January 1st in 2008 to December 31st in 2009, and a subsequent 1-year follow-up.

Results: 838 patients referred 559 attended to and only 278 treated (33%); 55.4% males and 44.6% females; mean age of 46.4 years. The most important comorbidities were psychiatric (36.3%), cardiovascular (dyslipidemia 30.2%, hypertension 19.1%, diabetes 9.4%) and respiratory (chronic obstructive pulmonary disease (COPD), 15.1%; Obstructive Sleep Apnea Syndrome (OSAS), 11.9%; asthma, 7.6%). Treatments included varenicline (VRN), 36.7%, nicotine replacement therapy (NRT), 43.4%, bupropion, 13.3%, and psychological counseling only for 7.9%. Continuous abstinence rates at 3, 6, 9 and 12 months were 48.6% (n=135), 34.2% (n=95), 29.1% (n=81) and 27.7% (n=77), respectively, and failure, abstinence never achieved, was found for 14.7%. Of the 77 successfully treated patients, VRN obtained the best success rate (40.3%), followed by NRT (24.7%), psychotherapy (10.4%) and bupropion (10.4%). The 165 patients who relapsed obtained a high relapse rate at 3 months (23.7%), and 113 patients did not relapse.

Conclusion: Treatment success, considered to be continuous abstinence after 1 year, appeared in 27.7% of the sample.

Keywords

Smoking habit, Smoking cessation, Continuous abstinence, Treatment success, Failure, Relapse, Varenicline, Bupropion, NRT, Psychotherapy

Introduction

Smoking is a chronic addictive and relapsing disease that is maintained due to the dependency that nicotine causes. The main clinical manifestations include cardiovascular and respiratory disorders, and tumors appearing in various places [1-3]. In 2014 *JAMA* published a study that estimated the prevalence of smoking in 187 countries from 1980-2012. This showed that the global percentage of daily smokers has decreased by 25% for men and 42% for women but the absolute number of smokers has increased, probably due to population growth. In 2012 all around the world, smoking prevalence was higher among men than women except in Sweden. Over 50% of men smoke every day in countries like Russia, Indonesia, Armenia and Timor Leste. For women, the prevalence was higher than 25% in Austria, Chile and France, but the country with more smokers proved Greece with more than 30% [4]. According to a published survey in 2009, in Spain the prevalence was 29.9%, 26.2% smoked daily, 3.7% occasionally, 20.4% declared former smoker and 49.7% declared never having smoked [5]. Therefore smoking has a high prevalence and varies from country to country according to social, economic and cultural criteria, and it is the first cause of death in developed countries [6-9], with about 140 deaths a day. Every year in our country die almost 60.000 smoking and Health expects until 2030 in our planet smoking will kill more than 8 million people every year.

The objective of this article is to present healthcare results, these being continuous abstinence rates at 3-, 6-, 9- and 12-months follow-up in a specialized Smoking Cessation Unit (SCU) consultation at the Albacete University Hospital Complex over 2 years: 1 January 2008 to 31 December 2009.

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Patients and Methods

Healthcare resources

In 2003, the Castilla-La Mancha Health Service (SESCAM) developed the “Castilla-La Mancha Smoking Prevention and Treatment Plan, 2003-2010”, whose general objectives included cutting the smoking habit and, therefore, improving the health and quality of life of the community population, the healthcare service treating smoking, cutting smoking among adolescents and creating specialized smoking cessation units in eight hospitals in the area (Albacete, Alcázar de San Juan, Ciudad Real, Cuenca, Guadalajara, Puertollano, Talavera de la Reina and Toledo). The Specialized Smoking Treatment Unit (SSTU) at the Albacete University Hospital Complex (CHUA) is composed of two pneumologists and a female university nursing graduate (UNG) who had previously received specific smoking cessation training. Patients’ follow-up comprised a first visit when a general clinical history and a specific clinical history of smoking were created, and a physical examination, which included CO-oximetry, height, weight and blood pressure, was made. Having diagnosed someone as a smoker, a date for smoking cessation and for successive visits were set. Each patient received individual assistance and chose the pharmacological treatment to be used, which was selected according to several parameters (number of cigarettes smoked, nicotine-dependence test, CO-oximetry, patient’s comorbidity, contraindications and pharmacological interactions, and patient’s preferences, whenever possible). Patients were explained about possible side effects of drugs and instructions for correct use, as well as cognitive-behavioral psychological techniques, contract contingencies, self-analysis of reasons, or cigarette records. The second visit was organized on the day before the date set to start smoking cessation. During this visit, checks were made to see if smoking had reduced, if it had been programmed; the patient’s cigarette record; if pharmacological treatment had begun, if it was being correctly used; if any of the possible side effects were present or not. If pharmacological treatment had not begun, written instructions were handed out to begin treatment on the day smoking cessation was scheduled. During this visit, any signs of withdrawal symptoms were measured for the first time, support documents were handed out, conduct modification techniques were employed, and alternative activities and problem solving were recommended. During successive visits, withdrawal symptoms, CO-oximetry and vital signs were measured, problem solving was provided if necessary, and correct treatment use and any possible side effects were checked. Besides the medical doctor’s experience, the prescription of either drug treatment was based on the clinical characteristics of the patient, the severity of smoking, the personal preferences of each smoker as this may result in better compliance with recommended treatment. The SEPAR (Spanish Society of Respiratory Pathology) guidelines were followed to provide dose and duration of using of prescribed drug treatments. Keep in mind that you can consider the presence of a possible selection bias of patients to treatment groups. This would produce dependence and correlation between factors and treatments may invalidate the statistical inference in relation to the results regarding the effect of treatments. In this sense we must consider, first, that the aim of this study was to analyze the factors that may be related to the results regarding abstinence rate after a follow-up period.

Study description and statistical analysis

A descriptive, retrospective study of the results obtained after analyzing the whole patient sample that came to the SSTU at the Albacete Hospital Complex was conducted from 1 January 2008 to 31 December 2009. Follow-up lasted 1 year. The main parameter used to measure treatment success was the continuous smoking cessation rate over 1 year which, if achieved, was defined as treatment success. Other continuous smoking cessation cut-off points were used: 3, 6 and 9 months after smoking cessation treatment began. Validation of abstinence was verified by CO-oximetry and the patient’s verbal statement. Values were measured with a Micro Smokerlyzer CO-oximeter (Bedfont Scientific; Rochester, UK) by fixing CO

concentrations in exhaled air to be under 10ppm. Patients were treated with the psychological and pharmacological combination, using 300mg bupropion, 1mg or 0.5mg varenicline every 12h and/or NRT as 21mg, 14mg and 7mg chewing gum, pills and/or patches. The study variables were obtained by means of a clinical interview, doing a clinical history review and using a database created with the SPSS software, version 18. First a data quality control was done by identifying any anomalous data in each variable. Then the frequency and valid percentage of the qualitative variables were determined, while central trend measures (mean), dispersion measures (interquartile range – IQR) were employed with the quantitative variables.

Results

Sample description

The specialized consultation attended to 838 patients in all, of whom 559 came to the visits (66.7%); 53.7% (n=300) were men and 46.3% (n=259) were women, of whom 281 did not return after the first visit, which left 278 smokers who started treatment (33%). In the studied variables (age, sex and comorbidities) no statistically significant differences were observed among patients referred and patients attending successive visits. Of these 278 who started treatment, 55.4% were male (n=154) and 44.6% were female (n=124), and their mean age was 46.45 years (an age range of 18-79 years). The mean age at which smoking commenced was 16.83 years (an age range of 8-years) and the mean number of cigarettes smoked was 27.38 cigarettes/day. Patients presented a mean moderate-severe physical dependence (6.13), measured by the Fagerström test, and a high degree of motivation (8.29), according to the Richmond test. The concentrations determined by Co-oximetry gave a mean value of 16.82 with a standard deviation of 9.73. The sample patients reported having made at least 1.43 previous attempts to stop smoking, with a mean duration of 224.49 days of abstinence before they made the present smoking cessation attempt. Finally, of the 278 patients (33%) who commenced treatment, 165 (19%) finished it. [Figure 1](#) shows the patients who were sent to the SSTU. The following comorbidities associated with the sample patients were found, and are presented in order of frequency: first, the psychiatric pathology with 36.3% (n=101), of whom 91 patients (32.7%) showed depression/anxiety; second, the group of cardiovascular comorbidities: dyslipidemia 30.2% (n=84), HBP 19.1% (n=53) and diabetes 9.4% (n=26); lastly, respiratory comorbidity: COPD in 15.1% (n=42), SAHS in 11.9% (n=33) and asthma in 7.6% (n=21).

Treatment guidelines

All the patients attended to received personalized pharmacological treatment and/or psychotherapy. Of the 278 patients, 36.7% (n=102) were treated with varenicline (95 of them with 1 mg/12 h; 4 patients with 0.5mg/12 h; 2 with VRN and patches and 1 on varenicline and nicotine gum); in 43.4% (n=117) of the cases NRT was administered to, with bupropion prescribed to 37 patients (13.3%), and only psychological counseling was given to 22 cases (7.9%). [Table 1](#) offers

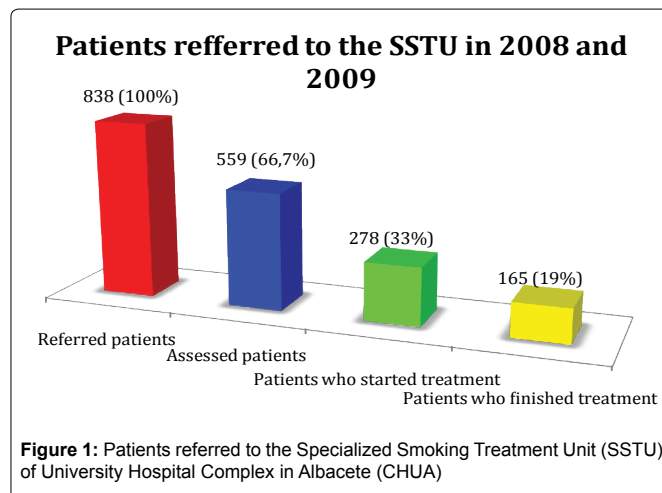


Table 1: Frequencies and percentages of the treatments prescribed to the sample of patients

Treatment types	Frequency	Percentage	Valid percentage	Accumulated percentage
Psychotherapy	22	7.9	7.9	7.9
Gum	33	11.9	11.9	19.8
Patches 21mg - 14mg - 7mg	16	5.8	5.8	25.5
Patches 14mg - 7mg	68	24.5	24.5	50
Bupropion 300mg	37	13.3	13.3	63.3
VRN 1mg/12h	95	34.2	34.2	97.5
VRN 0.5mg/12h	4	1.4	1.4	98.9
VRN and gum	1	0.4	0.4	99.3
Patches and VRN	2	0.7	0.7	100
Total	278	100	100	

VRN: Varenicline

Table 2: Continuous abstinence rates at 3, 6, 9 and 12 months at the SSTU of CHU in Albacete

Continuous abstinence at 3 months		
	Frequency	%
No	143	51.4
Yes	135	48.6
Total	278	100.0
Continuous abstinence at 6 months		
	Frequency	%
No	183	65.8
Yes	95	34.2
Total	278	100.0
Continuous abstinence at 9 months		
	Frequency	%
No	197	70.9
Yes	81	29.1
Total	278	100.0
Continuous abstinence at 12 months= Treatment success		
	Frequency	%
No	201	72.3
Yes	77	27.7
Total	278	100.0

SSTU: Specialized Smoking Treatment Unit; CHU: University Hospital Complex

Table 3: Success according to the treatments used in the SSTU of CHU in Albacete

Treatment type	Success Frequency			Total
	No	Yes	%	
Psychotherapy	14	8	36%	22
Chewing gum	26	7	21%	33
Patches 21 mg - 14 mg - 7 mg	14	2	12%	16
Patches 14 mg - 7 mg	49	19	27%	68
Bupropion 300 mg	29	8	21%	37
VRN 1 mg/12 h	64	31	33%	95
VRN 0.5 mg/12 h	3	1	25%	4
VRN and gum	0	1	100%	1
Patches and VRN	2	0	0%	2
Total	201	77		278

STU: Specialized Smoking Treatment Unit, CHU: University Hospital Complex, VRN: Varenicline

the frequencies and percentages of the treatments prescribed to the patients in the study sample.

Treatment success

The frequencies and percentages of the abstinence rates at 3, 6, 9 and 12 months were collected (Table 2). Of the 278 treated patients, 27.7% (n=77) were successfully treated, as the table shows Table 3 reflects the success frequency of the whole sample (n=278) for each prescribed treatment. Of the 77 patients who achieved continuous abstinence after 1 year, the highest success percentage was obtained for those patients treated with varenicline (40.3%, n=31), followed by NRT using 14 mg patches every 24 h for 42 days and the 7 mg

Table 4: Relapses in patients treated at the SSTU of CHU in Albacete (expressed as frequency and percentage)

Relapse	Frequency	Percentage
No	113	40.6
First week	16	5.8
First month	41	14.7
At 3 months	66	23.7
At 6 months	28	10.1
At 1 year	14	5.0
Total	278	100.0

SSTU: Specialized Smoking Treatment Unit, CHU: University Hospital Complex

patches for another 14-day period (24.7%, n=19), and then by psychotherapy (10.4%, n=8) and bupropion (10.4%, n=8). In overall study sample, success in smoking cessation was 18.9% in patients who developed respiratory comorbidity, 3.2% in those suffering cardiac pathology and 10.4% in patients with psychiatric comorbidity. No success was showed in 100% of patients who associated concomitant cardiovascular and respiratory comorbidity.

Relapses, failure and reasons to drop out

Table 4 shows that 113 of the 278 patients did not relapse. The third month was when more relapses occurred (n=66, 23.7%). The reasons for dropping out of the study sample were side effects in 13 patients (4.7%), the patient's own decision in 77 cases (27.7%) and other causes in 14 patients (5%).

Discussion

Our sample's epidemiological data

In Spain, the mean age when smoking commences is around 13.4 years [1,2,5,6,10]. In our study sample, this mean age was 16.83 years (an age range of 8-36 years). Overall smoking prevalence has lowered over the years, although this reduction is basically attributed to men since smoking prevalence has actually increased among women [10]. Our study showed a slight male predominance (55.4% males vs. 44.6% females), which confirmed today's trend. Heavier smokers are usually aged between 45-64 years [10,11], so it is logical that the mean age of our patients was 46.45 years. Smoking is a pathology that causes serious comorbidities, such as cardiovascular and respiratory disorders, and tumors in several places [1,2,6], among others. The most outstanding pathologies in our study sample were of the psychiatric and respiratory kind, as well as cardiovascular risk factors.

Treatment employed

Of all the patients in this study, 100% received personalized treatment, psychological cognitive-behavioral therapy, and they were all offered pharmacological treatment. It is worth stressing that 7.9% of the patients did not receive pharmacological treatment, but received only psychological counseling. All the published meta-analyses coincide in pointing out that smoking treatment efficacy does not depend on the format it is offered in [9,12,13]. The indication of one format or another depends on the characteristics of the population being attended to and the therapeutic team's working methodology. According to the characteristics of the consultation, space and personnel, our group used only an individual format. Prescribing one pharmacological treatment or another is based on the patient's clinical characteristics, the degree and severity of smoking, and each smoker's personal preferences [9,14]. NRT was the most widely used therapy, regardless of chewing gum or patches, or it being combined with varenicline, as 42.2% of the sample accepted it, followed by varenicline (36.7%), and finally, by bupropion (13.3%). In all cases, taking the smoker's preferences into account before suggesting any therapy type was recommended because this could help achieve better compliance to recommended treatments [12].

Dropout rates

We should stress the high dropout rate that we recorded while the 2-year check-ups were underway; only 66.7% of the patients who were

Table 5: Table comparing the continuous abstinence rates at 3, 6, 9 and 12 months in various Spanish studies and our consultation

Duration of continuous abstinence	Multicenter 2002	Elche (Alicante) 2005	Madrid 2004-2007	Zaragoza 2002-2007	Albacete 2008-2009
3 months	53.1%	36.1%	-	41.3%	48.6%
6 months	38.8%	22.7%	58.5%	-	34.2%
9 months	-	14.9%	-	-	29.1%
12 months	-	11.4%	54.9%	-	27.7%

initially sent to the consultation continued coming. Of those who came, 50.3% also dropped out. Therefore, only 33% of the total initial study sample started treatment. Perhaps several factors could explain this fact; many of the patients who were sent to the consultation did not voluntarily apply to do so, but were referred by their specialist. During the first consultation, to a lesser extent, patients sometimes explained the difficulties they had to come to the consultation because opening times were incompatible; they had problems getting there, among others. There were even patients who stated that treatment was expensive. This high dropout rate made us consider two needs: making available adequate knowledge of the criteria to refer patients to the specialized consultation; suitable training in this field of the healthcare personnel who leads the SSTU correctly assessing and informing smoking patients in order to optimize resources and to improve the general healthcare offered to the smoking population in the province of Albacete.

Overall success, relapses and treatment used

One of the difficulties of conducting studies into treating smoking is assessing its efficacy as exactly as possible. The results are always estimated based on what patients state and on confirmation made by biological methods, among which the CO test is the most widely used [11]. Another difficulty lies in having to measure efficacy and not over estimating the obtained results. Hence abstinence tends to be defined as the results obtained from intention to treat; that is, the confirmed success percentages of all patients who started treatment. Our study employed the compliance of both criteria as a success criterion. Another relevant aspect to bear in mind is to consider continuous abstinence based on the patient's and/or family relation's self-declaration, and measuring CO-oximetry. The self-declaration procedure is widely used in studies into smoking [15-19]. Although some authors have confirmed a percentage (which is quite often a considerable figure) of subjects who lie about their smoking habits while visiting their doctor [20], a sufficiently high percentage of reliable answers are given by subjects, to the extent that the test to determine the CO exhaled in air could be done away with, and not even be used to verify abstinence [21]. Some of the variables associated with the abstinence time in this study were having received medical treatment to stop smoking or not, treatment type (NRT, varenicline or bupropion) and the number of cigarettes smoked. Use of treatment combined with smoking cessation counseling multiplies the possibilities of success by 1.7, if compared to receiving only psychological counseling, and [9] by 1.4 as opposed to receiving only pharmacological treatment. All the patients in our sample received cognitive-behavioral psychological therapy and were also offered a pharmacological treatment. Of the whole sample, 7.9% received only psychological counseling, with a success rate of only 10.4% as opposed to success rates of up to 40.3% for those who received a combined therapy with VRN, either in association with other treatments or not, as well as psychological counseling. The results obtained for abstinence from smoking over 1 year can vary in specialized smoking units, with ranges covering 14.9-54.9% depending on the place applied and treatment type employed [15,22-25]. The literature includes many studies that have compared abstinence rates for the drugs we used in our study and also for placebos. It is very important to mention that the aim of our study was not to compare the results obtained with other published original investigations due to it was a small descriptive sample. Finally, the Table 5 shows the results obtained in different Spanish specialized units, including those we report herein. Basically, if we bear in mind the major differences among them in terms of design

and ways of acting, in comparison to the results of these units, the results of the Albacete unit were not that different since the overall continuous abstinence rates obtained were 48.6% at 3 months, 34.2% at 6 months, 29.1% at 9 months and 27.7% at 1 year. The causes of the low success rates obtained for smoking cessation could be related with the fact that the sample included heavy smokers who had been smoking for years and who had significant associated comorbidities. A high post-treatment relapse rate has also been reported in other studies [15]. It is known that the long-term probability of abstinence is related with persisting with abstinence since treatment begins and throughout follow-up [15-17]. In our study sample, abstinence at 1 year was 27.7%, which falls, therefore, within the range of percentages reflected in other studies, and most relapses occur basically during the first 3 months (23.7%), which coincides with other series [22,29]. To conclude, we the authors believe that despite the fact that much work still needs to be done to obtain the best smoking cessation results, above all in primary and secondary prevention health care, the continuous abstinence rates in our specialized consultation, and the differences found with other units, are in line with similar published results.

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