

## Review Article

# Concomitant Treatment of Tobacco Dependence during the Admission for Detoxification of Other Drug of Abuse: Evaluation at 6 Months Follow-Up after Discharge

Toll A<sup>1</sup>, Fonseca F<sup>1,2</sup>, Francisco E<sup>3,4</sup>, Bergé D<sup>1,2,5</sup>, Pérez V<sup>1,2,5</sup> and Torrens M<sup>1,2,\*</sup>

<sup>1</sup>Department of Pharmacology and Psychiatry, Universitat Autònoma de Barcelona, Spain

<sup>2</sup>Universitat Autònoma de Barcelona, Spain

<sup>3</sup>Parc Sanitari Sant Joan de Deu, Spain

<sup>4</sup>Fundació Nou Barris per a la Salut Mental, Spain

<sup>5</sup>Centro de Investigación Biomédica en Red de Salud Mental (CIBERSAM), Spain

\*Corresponding author: Torrens M, Department of Pharmacology and Department of Psychiatry, The Autonomous University of Barcelona, Institut de Neuropsiquiatria i Addiccions (INAD) and Institut Mar d'Investigacions Mèdiques (IMIM), Barcelona, Spain

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## Abstract

Most patients with substance use disorders are also heavy tobacco smokers, which imply an important mortality risk factor. Therefore, providing a treatment for nicotine dependence in the context of the treatment of other substance use disorders is recommended in many treatment guidelines. However, it is not clear that the concomitant treatment of nicotine dependence during the admission for detoxification of other drug of abuse, will improve the smoking cessation after the hospital discharge.

The aim of this study was to evaluate the tobacco use characteristics in terms of nicotine dependence severity, and motivation to quit smoking, in patients admitted to a detoxification unit, at baseline and at 6 months follow-up after discharge.

A total of 62 patients were assessed, the 94% presented concomitant nicotine dependence, and the 93% of them needed during their admission treatment with nicotine replacement therapy. Nicotine dependence severity was assessed with the Fagerström test, and tobacco use and motivation to quit smoking were assessed by the Richmond questionnaire. After discharge, only two patients maintained nicotine abstinence for more than 90 days without specific treatment for nicotine dependence. Nevertheless, at six months follow-up, the dependence severity decreased and patients showed a medium motivation to quit smoking. Providing specific treatment for nicotine dependence after detoxification to prevent new relapses should be integrated in addiction treatments.

**Keywords:** Smoking ban; Nicotine dependence; Nicotine replacement therapy; Motivation to quit; Detoxification

## Abbreviations

NRT: Nicotine Replacement Therapy; HIV: Human Immunodeficiency Virus; HCV: Hepatitis C Virus; m: Mean; sd: Standard Deviation; p: Statistical Significance

## Introduction

More than 60 % of patients with severe mental disorders are tobacco smokers and 35 % of them smoke more than 20 cigarettes per day, which is considered an important mortality risk factor [1,2]. Tobacco use is estimated to shorten life expectancy by 12-13 years in mentally ill smokers and consequently about half of smokers will die from a tobacco-related disease. Therefore, this cause of death has become more important than HIV, other substances, traffic accidents and violence together in these patients. Moreover, if we look general population, the prevalence of young smokers has become higher in the last few years, the 28.5% of people aged 15 and over are occasional smokers (34.2% of men and 22.9% women) and the 21.8% of the population aged 15 and over are former smokers. In relation to gender, it seems that men have higher prevalence of smoking than women at all ages, with very close percentages among young people (between 15 to 24 years) and more distant as the groups are older.

In Spain, 30% of general population is smoker, but if we focus on psychiatric patients we can see that 52% of them are smokers, rising to 80% in schizophrenic patients specifically. These same rates are given to other countries like the United States [3].

Patients with Substance Use Disorders (SUD) present a prevalence of nicotine dependence twice than general population. Also, these patients usually smoke more cigarettes and presented a lower age of onset of nicotine dependence [3]. In some studies it has been described that nicotine dependence is a prognostic factor for the addiction to alcohol and other drugs [4]. The consequences of this comorbidity are important in terms of mortality. Patients previously treated for alcohol dependence disorder or other substances have consequently an increased mortality for tobacco-related disorders, more than other substance related disorders [5]. For example, a 24 year follow-up study of substance abuse patients shows that smoker's patients have a 4 times higher mortality rate than non-smoker patients [6].

In general population, tobacco abstinence (even at 40-50 years) causes an improvement in the risk of lung cancer [7]. Nevertheless, there are few data about the effect of smoking cessation in patients with other addictions, although it has been described an improvement

in their quality of life [8]. Therefore, since the last decade, providing a treatment for nicotine dependence in the context of the treatment of other addictions has become a common option [9-11]. However, there is no clear agreement if the intervention for nicotine dependence should be concomitant during the treatment for other SUD [12-15]. A meta-analysis of smoking cessation intervention in individuals with other concurrent SUD, showed a trend to better results in terms of tobacco abstinence in those patients with a sequential intervention compared to those with a concomitant intervention (38% versus 12% of abstinence); on the other side, the tobacco intervention did not affect the abstinence of the other substances in both groups [16].

Several smoking bans have been implemented in psychiatric wards all around the world. Whereas the smoking ban started nationwide in 1992 in the United States, European countries and specially Spain have delayed the start of the ban for years. In Spain the law 42/2010 [17] expressly forbids smoking in all health centers including psychiatric hospitals, with the exception of medium- and long-stay psychiatric hospitals, where special indoor or outdoor smoking places can be designated. Nevertheless, the Spanish smoke-free regulations have been progressively implemented in the different psychiatric units between 2012 and 2013. However, it is not clear that the implementation of the smoking ban improves the smoking cessation. Some studies affirm that the smoking ban increases the proportion of smokers who attempt to quit smoking [18]. But others assert that many patients continue to smoke, indicating that bans are not necessarily effective in assisting people to quit in the longer term [19,20].

With this study we aim to evaluate the changes in nicotine dependence severity, tobacco use and motivation to quit smoking after an admission to a detoxification unit, at baseline and at 6 months follow-up.

## Materials and Methods

Data were collected from all patients admitted to a detoxification unit in Barcelona (Spain) in the period comprised between January 2011 and June 2011, immediately after the smoking ban came into effect (2<sup>nd</sup> of January 2011). The mixed sex inpatient detoxification unit was located in the psychiatric department of a general teaching hospital. This was a five-bed unit providing assessment and medically assisted withdrawal to individuals with drug and alcohol dependence disorders. All patients were admitted on a voluntary and planned basis. Patients were remitted for admission if they were substance-dependent, with a risk of severe or medically complicated withdrawal symptoms (e.g polysubstance abuse), co-morbid general medical conditions that made ambulatory detoxification unsafe, and/or a documented history of not engaging in or benefiting from treatment in outpatient facilities. Services were provided free of charge to the patient. During the admission visits and contact with relatives were not permitted, and patients could go on leave of absence for 1-3 hours a day length, consisting of a walk around the hospital, always along with the nurses of the unit. Smoking was forbidden during all the admission (including the leave of absence).

Sociodemographic data (age, gender, educational level and employment status) and clinical data (diagnosis, main drug of abuse that motivates admission, psychiatric comorbidity, somatic

comorbidity and complete detoxification rate) were collected. Assessment also included the need for Nicotine Replacement Therapy (NRT) and the type: gum, patches or combined. NRT was administered depending on the severity of addiction. Besides NRT, a weekly psychoeducational group is performed in the unit, related to smoking issues. The researchers also assessed the tobacco use (cigarettes per day) and nicotine dependence severity, using the Fagerström Test for Nicotine Dependence [21]. The Fagerström Test for Nicotine Dependence is a standard instrument for assessing the intensity of addiction to nicotine. The test was designed to provide an ordinal measure of nicotine dependence related to cigarette smoking. It contains six items that evaluate the quantity of cigarette consumption, the compulsion to use, and dependence. In scoring the Fagerström Test for Nicotine Dependence, yes/no items are scored from 0 to 1 and multiple-choice items are scored from 0 to 3. The items are summed to yield a total score of 0-10. The higher the total Fagerström score, the more intense is the patient's physical dependence on nicotine. With these scores we also can classify patients according their level of nicotine dependence in three groups: low dependence ( $\leq 4$  points), moderate dependence (5 - 6 points) and high dependence ( $\geq 7$  points) [21,22].

At 6 months after discharge, patients were contacted by phone calls to assess tobacco use (cigarettes per day), nicotine dependence level using the Fagerström Test and motivation to quit smoking using Richmond self-reported questionnaire [23,24]. The Richmond questionnaire is a self-reported test that contains four items that evaluate the motivational degree to quit smoking. The items are summed to yield a total score of 0-10, where the first item is scored from 0 to 1 and others items are scored from 0 to 3. The cutoffs classify the patients in four groups according their motivation to quit smoking: low (0-3 points), doubtful (4-5), moderate (6-7 points) and high (8-10 points).

For the statistical analysis, sociodemographic and clinical data at baseline were compared between patients with and without nicotine replacement therapy using the Chi-square test for categorical data and Student's t test to compare the means for continuous data. Secondly, sociodemographic and clinical data between patients contacted or not contacted by phone at 6 months follow-up were compared also using the Chi-square test for categorical data and Student's t test to compare the means for continuous data. Data was analyzed using PASW Statistics v18.0 software (IBM, SPSS Inc).

## Results

A total of 62 patients were admitted from 1<sup>st</sup> January to 30<sup>th</sup> June of 2011. The mean age of these patients was 45 +/- 10 years and the 79% were men. In relation to main drug of abuse that motivates the admission, in 34 patients was alcohol (54.8%), in 10 patients was heroin (16.1%), and in 10 patients was cocaine (16.1%) and the other 8 patients were admitted to detoxify other substances (13%). Moreover, 58 of these patients were also common tobacco users (94%). And 50 of these patients required nicotine replacement therapy (87%) during the admission, 1 patient with patches (2%), 4 patients with nicotine gums (7%) and 45 patients with combined therapy (91%).

When we compared patients with (n = 54) and without (n = 8) nicotine replacement therapy we did not find any significant

**Table 1:** Sociodemographic and clinical data between patients treated with NRT and patients without NRT.

	NRT (n = 54)	Not NRT (n = 8)	P
<b>Gender (%men)</b>	42 (78)	7 (88)	1.000
<b>Age (m +/- sd years)</b>	44 +/- 9	50 +/- 13	0.107
<b>Educational level (%)</b>			
- Not studies	7 (13)	1 (12)	0.616
- Primary studies	26 (48)	5 (62)	
- Secondary studies	18 (33)	1 (12)	
- University	3 (6)	1 (12)	
<b>Employment status (%)</b>			
- Active	7 (13)	0 (0)	0.153
- Inactive	11 (20)	0 (0)	
- Pensioner	36 (67)	8 (100)	
<b>Drug that motives admission (%)</b>			
- Alcohol	29 (54)	5 (62)	0.875
- Cocaine	8 (15)	2 (20)	
- Heroin	9 (17)	1 (12)	
- Cannabis	2 (4)	0 (0)	
- Benzodiazepines	2 (4)	0 (0)	
- Methadone suppression	4 (7)	0 (0)	
<b>Psychiatric comorbidity (%)</b>			
- Axis I	10 (18)	1 (12)	0.873
- Axis II	7 (13)	2 (25)	
- Axis I and II	4 (7)	1 (12)	
<b>Somatic comorbidity (%)</b>			
- HIV infection	11 (20)	1 (12)	0.700
- HCV infection	20 (37)	2 (25)	
- Chronic liver dysfunction	15 (28)	2 (25)	
<b>Completed detoxification (%)</b>	39 (72)	4 (50)	0.235

NRT: Nicotine Replacement Treatment; m: Mean; sd: Standar Deviation; HIV: Human Immunodeficiency Virus; HCV: Hepatitis C Virus

**Table 2:** Tobacco use, Fagerström test and dependence severity between patients with NRT and patients without NRT.

	NRT (n = 54)	Not NRT (n = 8)	P
<b>Tobacco use (cigarettes per day) (m +/- sd)</b>	23 +/- 11	7 +/- 14	0.001*
<b>Fagerström test (m +/- sd)</b>	7 +/- 3	2 +/- 4	< 0.001*
<b>Dependence severity (%)</b>			
- Low dependence	10 (18)	6 (75)	0.008*
- Moderate dependence	8 (14)	1 (12.5)	
- High dependence	36 (68)	1 (12.5)	

NRT: Nicotine Replacement Treatment; m: Mean; sd: Standar Deviation

\*Statistically Significant

differences in terms of sociodemographic data (age, gender, study level and employment status). We neither found significant differences between both groups in terms of main drug of abuse that motivates the admission, psychiatric comorbidity, somatic comorbidity and complete detoxification rate (Table 1). On the other hand, we found significant differences between both groups in terms of tobacco use (23 +/- 11 cigarettes per day vs. 7 +/- 14 cigarettes per day,  $p = 0.001$ ), Fagerström test score (7 +/- 3 vs. 2 +/- 4,  $p < 0.001$ ) and dependence severity ( $p = 0.008$ ) (Table 2).

Six months after the discharge of the detoxification unit, we contacted by phone with patients that required nicotine replacement therapy of these 54 patients, 18 (33%) answered, 22 (41%) did not answer, 6 (11%) telephone number had changed, 7 (13%) could not be contacted for other reasons and 1 patient was dead. When we compared baseline characteristics of patients that we could locate ( $n = 18$ ) and patients that we couldn't locate ( $n = 36$ ) we only found differences in employment status ( $p = 0.032$ ) in view of the fact that non-located patients were more active than located patients. We did

**Table 3:** Sociodemographic and clinical data between located patients and non-located patients at baseline.

	Located (n = 18)	Non-located (n = 36)	p
<b>Gender (%men)</b>	13 (72)	29 (81)	0.506
<b>Age (m +/- ds years)</b>	42 +/- 9	44 +/- 9	0.431
<b>Educational level (%)</b>			
- Not studies	2 (11)	5 (14)	0.231
- Primary studies	7 (39)	19 (53)	
- Secondary studies	9 (50)	9 (25)	
- University	0 (0)	3 (8)	
<b>Employment status (%)</b>			
- Active	3 (17)	4 (11)	0.032*
- Inactive	0 (0)	11 (31)	
- Pensioner	15 (83)	21 (58)	
<b>Drug that motives admission (%)</b>			
- Alcohol	11 (60)	18 (50)	0.819
- Cocaine	3 (17)	5 (14)	
- Heroin	2 (11)	7 (19)	
- Cannabis	1 (6)	1 (3)	
- Benzodiazepines	0 (0)	2 (6)	
- Methadone suppression	1 (6)	3 (8)	
<b>Psychiatric comorbidity (%)</b>			
- Axis I	5 (11)	5 (14)	0.399
- Axis II	1 (6)	6 (17)	
- Axis I and II	2 (11)	2 (6)	
<b>Somatic comorbidity (%)</b>			
- HIV infection	5 (28)	6 (17)	0.552
- HCV infection	8 (44)	12 (33)	
- Chronic liver dysfunction	6 (33)	9 (25)	
<b>Completed detoxification (%)</b>	11 (61)	28 (78)	0.216

m: Mean; sd: Standar Deviation; HIV: Human Immunodeficiency Virus; HCV: Hepatitis C Virus

**Table 4:** Tobacco use, Fagerström test and dependence severity at baseline between located patients and non-located patients.

	Located (n = 18)	Non-located (n = 36)	p
<b>Tobacco use (cigarettes per day) (m +/- sd)</b>	26 +/- 10	22 +/- 11	0.213
<b>Fagerström test (m +/- sd)</b>	8 +/- 2	6 +/- 3	0.115
<b>Dependence severity (%)</b>			
- Low dependence	2 (11)	8 (22)	0.264
- Moderate dependence	1 (6)	6 (18)	
- High dependence	15 (83)	22 (60)	

m: Mean; sd: Standar Deviation

not find any significant differences in baseline clinical data, neither in tobacco use and Fagerström test scores between both groups (Tables 3 & 4).

At six months after discharge, in the 18 patients that has been reevaluated, we detected a significant reduction in tobacco use (23 cigarettes/day vs 18 cigarettes/day,  $p < 0.001$ ) and in Fagerström test scores (8 points vs 5 points,  $p < 0.001$ ) compared to the results at admission. Moreover, the motivation to quit smoking assessed with Richmond questionnaire presented a mean score of 5 +/- 2.8 points, which represented a moderate motivation to quit smoking. Besides, only three patients maintained abstinence after hospitalization during 2, 90 and 120 days, respectively. None of the patients received specific treatment for smoking cessation after the discharge.

## Discussion

As we expected, the majority of patients (94%) admitted to Hospital Detoxification Unit presented concomitant diagnosis of nicotine dependence, and the 93% of them needed during their

hospitalization treatment with nicotine replacement therapy (most of them in combined form). The most important finding of this study is that at six months after discharge, and without specific treatment for nicotine dependence, the dependence severity decreased and patients showed a medium motivation to quit smoking. However, only two patients (17%) maintained nicotine abstinence for more than 90 days.

Patients with substance use disorders in relation to general population have a two-fold prevalence of nicotine dependence, which show higher scores in Fagerström test, more withdrawal symptoms [25,26] and makes more complex nicotine dependence treatment. These patients use more cigarettes per day and start their tobacco use at earlier ages [27,28]. Nicotine dependence had been obviated systematically in addiction treatment, and considered as a minor problem. However, in recent years, it has been described as a powerful prognostic factor for alcohol and other substances dependence [29]. A recent study shows that tobacco smokers have 5 times higher probability to develop dependence disorder to alcohol, benzodiazepines, stimulants and opioids; and even higher probability (up to 9 times more) to develop cannabis dependence disorder [4].

Another point that has being controversial about treatment of nicotine dependence in substance use disorders is the best time to do this intervention [11]. So, is there an acute contraindication to cessation of tobacco use or are there psychiatric reasons why the cessation should be postponed? Some studies on this field have shown that the best time for cessation would be when the patient is in a stable phase, with no recent or planned changes in medications and no urgent problems take precedence [30]. Moreover, because little is known so far about the treatment of nicotine dependence of patients with acute mental illness, the APA treatment guidelines recommends to consider some important questions before deciding on treatment of these patients [31]: "Are there any psychiatric reasons for concern about whether this is the best time for cessation? Is the patient about to undergo a new therapy? Is the patient presently in crisis? Is there a problem that is so pressing that time is better spent on this problem than on cessation of tobacco use? What is the likelihood that cessation would worsen the non-nicotine-related psychiatric disorder? Are there any signs or symptoms of other undiagnosed psychiatric or substance use disorders that might interfere with efforts to quit tobacco use?". Besides, it is important that the consequences of nicotine dependence are clearly explained and that the information on the treatment process is given in detail, allowing the patient to actively participate [32]. Therefore, cessation of tobacco use is recommended in substance dependent patients who are admitted to hospital for withdrawal from a different substance (for example, alcohol) [16]. In any case, the diagnosis of nicotine dependence should be among the documented treatment goals, so that withdrawal treatment can be performed at least at a later date. Despite this, the studies conducted with patients with substance use disorder and comorbid nicotine dependence show different results. In one hand, some studies have found a poorer prognosis in smoking outcomes when the treatment is performed simultaneously [12-14]. On the other hand, some studies conclude that simultaneous treatment did not implies a worsening in alcoholic relapses, neither other substances [15,33], and it has better results in terms of nicotine abstinence [34-36]. A meta-analysis conducted by Prochaska et al. [16] concluded that the fact to quit smoking during a detoxification treatment of other substance does not imply higher relapse probability.

Recent studies demonstrate that the introduction of smoking bans in psychiatric and addiction inpatient settings is possible [37,38], but they would need to be a clearly and carefully planned process involving all parties affected by the bans. Imposing bans in inpatient settings is seen as only part of a much larger strategy needed to overcome the high rates of smoking among mental health populations [20]. The poor abstinence rates in tobacco after discharge, although patients received specific treatment for smoking abstinence makes clear that it could be important design and provide a specific treatment for nicotine dependence after acute detoxification to prevent new relapses. Several guides are available for this kind of patients [32,39-42], for example, the Cochrane Collaboration has recently published a study protocol aiming to address tobacco cessation interventions specifically in alcohol and drug abuse populations [43]. Usually, more intensive interventions are needed in patients with comorbidity with other SUD [25]. To improve successful treatment probability it would be recommended to use a combined pharmacological and psychological treatment, in the context of intensive program if it is possible. In spite of efficacy of these treatments, abstinence percentages in this kind of population are moderate at long term. Therefore, it seems to be necessary to integrate nicotine dependence treatments in detoxification programs.

Our study may have several limitations. On one hand, the loss of patients at follow-up makes difficult the generalization of results. On the other hand, the study period only comprised 6 months of follow-up, so studies that considering longer periods of time may show more significant results. So, in our opinion, more studies should be done to clarify these issues.

## Conclusion

Patients with a substance use disorder have a higher prevalence of nicotine dependence with higher severity than in general population. Motivation to quit smoking and severity of nicotine dependence tends to decrease after being discharged for other substance use detoxification even without specific nicotine outpatient intervention; although, the low rate of response makes difficult of generalize the results. Thus, although it is not still clear when is the best moment to quit smoking in these patients (sequentially or simultaneously at detoxification treatment), most of this specific population will benefit of adequate treatment of nicotine dependence after discharge for other substance use detoxification.

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