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Research Article

Smoking Cessation in Clinical Practice: Experience of a Multidisciplinary Team in Smokers with Multiple Chronic Conditions

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ABSTRACT

Objectives: To inform the profile of smokers with multiple chronic conditions (MCC) inserted in a unit aimed at smoking cessation, as well as the routine of a team of health professionals in assisting this population.

Methods: Monocentric cohort study, retrospective longitudinal evaluation data from users of a therapeutic group for smoke cessation, with 51 consecutive groups of smokers with MCC assisted by a multidisciplinary team in Juiz de Fora, Brazil. Treatment consisted of pharmacotherapy and cognitive behavioural sessions followed by periodic evaluations up to 6 months.

Results: Of the 348 smokers, 61.8% were female the average age was 56.2±9.1 years-old and 75.4% had low education. Physical inactivity 61.7%; alcohol abuse 18.6%; obesity 40.5%; hypertension, 89%; diabetes mellitus type 2, 47.5%; depression 49.7% and cognitive decline of 85.8%, among other diseases. Comparing who remained abstinent for 24 weeks or more with those who could not stop smoking, the abstainers had cessation rates of 18.7%. Brief cessation represented 57.7% and late cessation 58.3%. Those who stopped at the 4th and 12th week of follow-up were those who maintained abstinence ($p<0.001$).

Conclusion: There was a considerable smoking rate, even among a population with multimorbidities and high cardiovascular risk. Strengthening, broadening and spreading tobacco control efforts is critical. Thus, health professionals must be motivated and able to conduct smoking cessation interventions.

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Introduction

Cardiovascular disease (CVD) is responsible for high mortality rates worldwide, as well as in Brazil. This is due both to the co-occurrence of its risk factors and to their inefficient control. Smoking is the most aggressive among the most likely risk factors for CVD development, and

there is an estimate of 1.1 million smokers worldwide [1-3]. It is estimated that one in 10 adult deaths is attributable to tobacco related diseases, totalling 5.4 million of annual deaths [4]. The life expectancy of an individual who smokes is 25% lower than that of a non-smoker and about 80% of tobacco-related deaths occur in developing countries [4, 5]. In Brazil, the prevalence of 14.7% of smokers was identified in 2014,

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10.1% in 2016 and it is currently 9.6% [6-8]. There is an increasing number of tobacco related diseases, characterized by the simultaneous development and unfavourable impact on general and cardiovascular morbidity and mortality [9-12]. Thus, smoking can be considered both an independent cardiovascular risk factor and a chronic psychiatric condition of nicotine dependence [3].

Cigarette smoking is a global concern, so encouraging cessation should be a priority goal in health services. Smoking cessation programs are cost-effective and recommended for the entire population, especially those at high risk [3, 13]. Both prevention of initiation and intervention for smoking cessation at all ages are beneficial and recommended in reducing smoking morbidity and mortality. Galil *et al.* (2016) observed a worse clinical profile among smokers, with various chronic conditions associated with current or previous tobacco use, such as chronic obstructive pulmonary disease (COPD), atherosclerosis, and depressive symptoms [14]. However, despite the great relevance, studies with population with MCC are still scarce. The objective of this study was to inform the profile of smokers with MCC inserted in a unit aimed at smoking cessation, as well as the routine of a team of health professionals in assisting this population.

Methodology

I Target Population and Study Site

The Unit of Integral Assistance of Smokers (UIAS or UAIT- Brazil) was created to assist smokers with arterial hypertension, diabetes mellitus (DM), chronic kidney disease (CKD), COPD, referred from outpatient clinics of the local University Hospital and the Primary Care Units of the Municipal Health Department of Juiz de Fora, Minas Gerais, Brazil. Patients were assisted and longitudinally followed by UAIT, at the Interdisciplinary Centre for Nephrology Teaching and Research (NIEPEN). Beyond UAIT's meetings, the team has been training graduate students of medicine, and postgraduate students of medicine, psychology, physiotherapy and nutrition to approach smokers in their future professional practices.

II Study Type and Duration

Monocentric cohort study, retrospective longitudinal evaluation data from users of a therapeutic group for smoke cessation. Data had collected through a structured instrument developed by the researchers, based on information from the form used in the service, from May 2012 to December 2018, in 51 consecutive groups.

III Ethical Aspects

The research was submitted to the Research Ethics Committee evaluation, and approved under protocol No. 1.103.000, of 05/26/2015. All participants signed the Informed Consent Form (ICF).

IV Demographic and Anthropometric Aspects

We considered elderly those aged 60 years and low educated those with less than or equal to 8 years of schooling [6]. The abdominal obesity was defined by waist circumference over 88 cm for women and over 102 cm for men, while obesity was determined by body mass index equal to or greater than 30 kg/m² [6]. Physical inactivity was considered as weekly

mild physical activity less than 150 minutes, although not necessarily associated with lack of sport [7].

V Aspects Regarding Smoking History and Data Related to Smoking

We considered heavy smokers those who smokes 20 or more cigarettes a day. Those who scored equal to or above 5 in the Fagerström Test were categorized as high nicotine dependent. At each meeting, the motivation for smoking cessation was evaluated by means of a 0 to 10-point graded ruler, in which zero would be the minimum and 10 the maximum motivation [13]. The monoximeter was used to measure Exhaled Carbon Monoxide (MCEX), which has a resolution of 1 ppm (parts per million) and normal levels are considered as fractions up to 8 ppm [15]. The INCA Cessation Index (IC/INCA) indicates the percentage of smokers who quit by the 4th week of cognitive behavioural approach meetings [6]. Brief cessation was considered to be the one that occurred until equivalent to the 12th week of treatment/beginning of meetings, coinciding with the end of drug treatment period, while the late cessation was one that occurred until the 24th week of follow-up, equivalent to 6 months of smoking cessation.

VI Instruments Used to Screen Smoking-Related Comorbidities

The Patient Health Questionnaire-2 (PHQ-2) was used for depression screening and was considered positive if the score was equal to or above 3 points [16]. The Montreal Cognitive Assessment (MoCA) was used to assess cognitive decline (scores lower or equal to 26 points) [17]. Alcohol abuse was measured by scores equal to or higher than 5 on Alcohol Use Disorders Identification Test (AUDIT-C) [18]. Clinical signs for obstructive sleep apnea syndrome was detected if there was a positive score in 2 or more categories in the Berlin Questionnaire [19]. Declared Atherosclerotic Disease (DAD) was flagged by the presence of previous vascular damage, regardless of location affected [14].

VII Statistical Analysis

Descriptive statistics presented the results as mean \pm standard deviation and frequencies. If the data had normal distribution, T-test or Chi-square test used according to the sample characteristics. Binary regression followed by logistic regression for variables considered significant used especially for assessing the association of smoking cessation. Statistical analyses was used the Statistical Package for Social Sciences for Windows (SPSS), version 23. It was considered significant a p value <0.05 .

VIII Official Operationalization of Smoking Cessation in Brazil

The work done by UAIT followed the consensus developed by the National Cancer Institute (INCA/MS). The Ministry of Health, through INCA, elaborated the Plan for the Implementation of the Approach and Treatment of Smoking in the Unified Health System (SUS) [9, 20]. In this effort, the Stop Smoking Without Mysteries program was developed with the primary objective of providing all the information and strategies needed to direct smokers' efforts to quit and relapse prevention [21]. Among the methods used in the program are the Cognitive Behavioural Approach (CBA) and pharmacotherapy that present sufficient scientific evidence on smoking cessation. INCA's smoking cessation program consists in four sessions of no more than 90 minutes once a week in

groups of 10 to 15 users. According to INCA, programs of this duration are as successful as the longer ones. Table 1 shows the steps

recommended by INCA, as well as the actions peculiar to each of them [7].

Table 1: Operationalization of smoking cessation management recommended by INCA for smokers assisted in public services in Brazil.

Sessions	Title	Objective
1	Understand why someone smokes and how it affects health	Make the patient aware of why they smoke and how it affects their health. Identify and clarify to the user the degree of physical and psychological dependence on nicotine and the barriers and facilitators to undertake cessation. Encourage participants to think about it and write down their reasons for quitting / not quitting
2	Learning how to deal with the first days without a cigarette	Guidance on the first days without smoking. Discuss abstinence syndrome and some measures to deal with craving such as exercising, increased water intake, practicing relaxation techniques, simulate smoking behaviour using foods.
3	How to overcome obstacles to remain without smoking	Elucidate ways to overcome obstacles and remain smoke free. To guide participants to understand the physical and emotional improvements in quitting cigarette smoking and participation in support groups' importance.
4	Benefits obtained after quitting smoking	To discuss the benefits gained after quitting and, especially, discuss relapse prevention.
5 a 8	Biweekly evaluation until week 12	Clinical evaluation for cravings, lapses or relapses; pharmacotherapy monitoring and adjustment; reinforcement in smoking cessation
9 a 17	Monthly assessment up to 12 months	There is no obligation on INCA's guidelines for presently evaluation up to 12 months; reinforcement in the maintenance of smoking cessation.
Patients will be considered former smokers if they become abstinent for at least 12 months.		

Source: Developed by the authors.

Results

I Regarding UAIT's Educational and Care Profile

The UAIT acts on two fronts: assistance and education. In the educational sphere, it promotes training and continuing education for health professionals in managing tobacco cessation. UAIT's intervention team is multidisciplinary with trained professionals to manage smoking cessation. The sessions had developed in a dynamic and dialogical manner, based on scientific knowledge, but in a simple and objective way, so that everyone could assimilate the contents covered. From the practice experienced by the team, some evaluations and interventions inserted in the development of UAIT's groups. Furthermore, after each session the team holds feedback meetings on the proposed tasks and preparation of future meetings.

Initially, smokers referred to UAIT identified through an electronic platform, and invited to join the group free of charge. It is important to highlight the large gap observed in the decision to quit smoking. Thus, before the first session, there is a collective meeting with the smokers - awareness meeting - when they are informed about the objectives of the intervention and the methodology used. Those who have agreed to participate sign the free and informed consent form. Also, in this meeting an anamnesis and semi-structured interview were conducted with the objective of investigating the sociodemographic data, the underlying diseases present, the smoking history. Besides that, the smokers conducted to assess alcohol abuse, depressive symptoms, obstructive sleep apnea syndrome and cognitive decline. All users instructed to bring the latest laboratory and imaging tests they had. There was pharmacological support when there was need for it.

The team's physician were responsible for the choice of medication and prescription, as well as the form of use - alone or in pharmacological

combination. Bupropion and Nicotine Replacement Therapy (NRT) were available. In special cases that required additional psychiatric evaluation, they had referred to this specialty. The professionals assigned to coordinate each meeting were facilitators, practicing listening, discussing clashes and doubts and strengthening, at each meeting, both the relevant points for the cessation of addiction and the mechanisms to reduce cravings and lapses. Following INCA's determination, the meetings after the 4 CBA sessions are carried out fortnightly until week 12. Maintenance has become a strong point of the work regarding the strengthening of the abstinence period and the avoidance of lapses and relapses. Patients who quit smoking for 12 months received, as an incentive, a former smoker certification. This intervention model continues to occur in the new treatment groups. The meetings had characterized by the interaction between the patients in their various stages of the smoking cessation process.

II UAIT's User Profile

To date, UAIT has conducted 51 intervention groups serving 348 smoking users with multimorbidities, an average of 6.82 participants per treatment group. The average age was 56.24±9.10 years, with higher prevalence of women and married people. In this cohort, more than three quarters had low education. There was a high prevalence of sedentary people, obese and its consequences, such as obstructive sleep apnea syndrome and abdominal obesity. Being a population with MCC, we observed that almost all were hypertensive, and more than half were diabetic. The high prevalence of depressive symptoms/depression, alcohol abuse and especially the large proportion of smokers with cognitive decline drew attention (Table 2).

Table 2: Biopsychosocial profile of UAIT assisted smokers.

General characteristics (N = 348)	Means ± standard deviation or percentages
Sociodemographic data	
Age (years)	56.24±9.10
Elderly	33.3
Male	38.2
Marital status (Married)	52.5
Low education level	75.4
Physical Exam Data	
Body Mass Index (kg / m ²)	28.77±6.14
Systolic blood pressure (mmHg)	136.76±21.60
Cardiovascular risk factors and associated comorbidities	
Abdominal obesity	59.9
Sedentary	61.7
Obesity	40.5
Alcohol abuse	18.6
Depression	49.7
Arterial hypertension	89
Diabetes mellitus	47.6
Chronic kidney disease	28
Declared atherosclerotic disease	40.9
Chronic obstructive pulmonary disease	25.5
Previous or undergoing cancer	3
Cognitive impairment	85.8
Obstructive sleep apnea syndrome	58.9

As for the smoking history, it observed that the addiction time was long, as was the frequency of heavy smokers with high nicotine dependence. When these smokers arrived at the 4th meeting, even those who did not stop smoking showed a significant reduction in the number of cigarettes smoked per day ($p<0.01$). Previous attempts to quit accounted for more

than three quarters of the sample with high motivation for cessation, observed since the first meeting and maintained until the fourth ACC meeting. There was a reduction in expired carbon monoxide levels between the 1st and 4th meetings. Combination therapy accounted for more than half of the prescribed interventions (Table 3).

Table 3: Smoking history and characteristics of smoking cessation in assisted smokers at UAIT.

Smokers Characteristics (N = 348)	Means ± standard deviation or percentages
Addiction Time (years)	37.73±11.36
Number of cigarettes smoked / day	22.55±14.49
Heavy smokers	68.5
High nicotine dependence	77.2
Pack years	43.48±32.45
Number of cigarettes smoked at 4th meeting	8.28±8.26
Previous attempts to quit smoking	77.7
Expired Carbon Monoxide 1st meeting	12.99±7.14
Expired Carbon Monoxide 4th meeting	8.49±6.39
Combination drug therapy *	46.8
Bupropion	52.3
Nicotine Replacement Therapy	55.6

* Bupropion associated with Nicotine Replacement Therapy.

Regarding the characteristics related to smoking cessation, a prevalence of 18.7% observed in the 4th week. At week 8, where most of the sample

was in the critical period of abstinence, 48.4% of cessation observed. At week 12, the prevalence of cessation was 58.3% and at 6 months of

treatment it was 57.7% (Figure 1). Smoking cessation observed in this cohort showed an increasing prevalence from the fourth ($p<0.003$) to the 12th week, so-called early cessation ($p<0.005$), when comparing those who quit to those who did not quit at the 24-week follow-up (Figure 1).

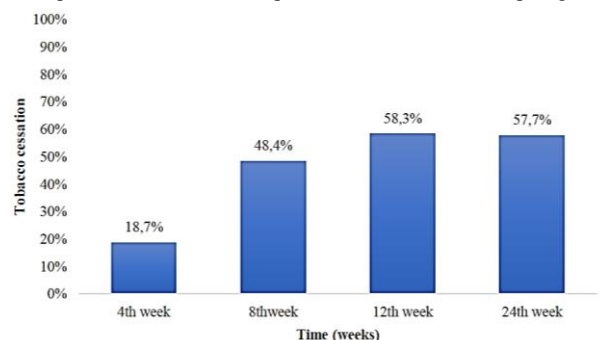


Figure 1: Smoking cessation rates of UAIT's assisted smokers by time.

Discussion

The smokers studied in this cohort had characterized by the coexistence of other chronic conditions and high cardiovascular risk, where the abandonment of addiction would imply a reduction in cardiovascular events and morbidity and mortality. The relevance of this study was to describe the routine care provided by a trained multidisciplinary team, coordinating several consecutive meetings, including CBA and drug treatment. It was known that the combination of similar interventions could be increase the rate for smoking cessation by up to 300% comparing unattended cessations [3]. In addition, these interventions could be reproduced in other locations with similar or better impact [3]. Smoking cessation was observed in the present study was high and it can be inferred that the chosen strategy has a great responsibility in this result. Although INCA claims that a 4-session program is as efficient as longer ones, our study did not show this fact. The identification of higher and significant cessation rates in groups of longer duration pointed to the need for a longer time with the users for the cessation to occur. In addition, encouraging health professionals to assist smokers of all ages in cessation should be a priority goal in health services [3, 5, 22].

Smoking cessation rates observed in this cohort showed an increasing prevalence from the fourth to the 12th week. According to data from Vigitel (2018), smoking cessation for people over 18 years in Brazil is 9.6% [8]. Our data for the same cessation period was 18.7%. The reason for these values above the national average had related to the set of comorbidities that the patients have accumulated over time and they already had several previous attempts to quit, what makes these attempts, even unsatisfactory in those moments, a favourable factor to the present cessation. There was a growing prevalence from the 4th to the 8th week and then to the 12th week, when the patient had already passed the first 4 weeks of abstinence, critical period for the main signs and symptoms of smoking withdrawal [3, 9]. There was a small decrease in smoking cessation in the studied population, comparing the 12th to the 24th week of treatment, close to 60% of cessation. It draws attention to the excellent rate of cessation for this period of smoking withdrawal, compared to previous studies that usually report rates close to 30% [5, 23].

Previous studies have shown that drug treatment is essential for heavy smokers, those with high dependence [3, 9]. Our sample had characterized by the high prevalence of heavy smokers, with high dependence and with multimorbidities. It had known that drug

combination increases the rate of cessation by increasing the potentiality of reducing cravings and smoking withdrawal symptoms and nearly half of our population used combined therapy (bupropion and nicotine replacement therapy) [3, 24]. Some strong points of this program were the action of the trained multidisciplinary team for all treatment meetings, creating and developing practical skills to cope with the cessation. The maintenance period was noteworthy as it has not been valued in practice [1, 3, 9]. Our differential was the face-to-face maintenance meetings, reinforcing, month by month, the reduction of cravings and lapses, the recognition and immediate action on triggers and possible relapses. Maintenance also encouraged the practice of physical activity, reduction of emotional stress, healthy eating, improvement of self-esteem and quality of life. It also reinforced how valuable is the increasing clinical improvement, with better control of comorbidities and overall health improvement.

As regards the sociodemographic profile, several studies indicate a higher rate of smoking among men [7, 9, 14, 20, 22]. Women may seek treatment more frequently than men, and this should be better assessed. The number of elderly people (35%) who sought treatment is also significant [20]. These individuals have been smokers for decades, they come from a time when smoking was seen as a lifestyle, and nicotine addiction was high or very high, which would make cessation difficult [20]. Viana *et al.* (2013), demonstrated that sex, age and marital status were factors associated with smoking in elderly population and showed the worst quality of life of these patients when they presented high nicotine dependence, longer exposure to smoking and shorter cessation time [25]. On the other hand, being elderly characterized a positive predictor for smoking cessation, since this subpopulation already overcame several difficulties during life and faced the cessation process with greater determination than other age groups [26].

In these cases, the help of the team was fundamental, clarifying that even if the benefits of cessation are more discreet the later it occurs, they are still real and significant. Smoking cessation is beneficial in any age group [3, 9, 21, 22]. The association between depressive symptoms and worse smoking cessation results reinforced the importance of recognition of this relationship. It is important to evaluate the mood of smokers, since smoking and nicotine withdrawal causes changes in the mental profile, besides interfering significantly in the effect of the medications used [26, 27]. It is important to remember that smokers with depressive symptoms are as motivated as the general population [28]. Although the same strategies should be applied to this group, close care and monitoring are relevant to these users [22, 28].

Although tobacco consumption in Brazil has decreased since the end of the 20th century, the study demonstrated a considerable rate of smoking, even among people with multimorbidities and high cardiovascular risk. A high prevalence of comorbidities had observed coexisting in the same smoker, making the profile of these users even more worrying with the maintenance of addiction. The face-to-face performance of a multidisciplinary team with a participatory and personalized care plan for each smoker, both during the ACC period, medical treatment and especially in maintenance, can represent a successful and cost-effective alternative. In an era where we have several technologies to encourage the management of chronic conditions, we cannot forget the inexhaustible potential present in the human component. In this way, it is essential to strengthen, expand and spread tobacco control efforts in

the country, and for this, health professionals need to be motivated and capable for the interventions pertinent to the smoking cessation process.

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Competing Interests

All authors declare that they have no financial relationships with any organization that may have an interest in the work submitted in the previous three years and no other relationship or activity that may appear to have influenced the work submitted.

Author Contributions

Galil AGS developed the idea of the study, collaborated in the selection, collection, data analysis and writing of the initial draft of the manuscript, in contribution with the other authors, as well as collaborating in the final writing of the work. Banhato EFC and Andrade BABB developed the details of the introduction, presentation of results and discussion, in addition to the detailed selection of articles, data collection and analysis. Gusmão MM, Rabello LA, Santos PBR and Lamas MFM were responsible for the execution of inquiries and patient information, as well as data archiving. Allied to the other collaborators, Gomes AS and Melo MM, participated in the writing of the methodology and discussion. Galil AGS and Bastos MG was responsible for revision and refining of the manuscript. The authors stated that the manuscript is an honest, accurate and transparent account of the study was reported; that no important aspect of the study was omitted. All rights reserved.

Data Sharing Statement

All data used to prepare this article are available from the sources cited.

Conflicts of Interest

None.

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