

# The Beneficial Effect of Limited Tobacco-Use (Thrice-Daily) with Risk-Identification and Medical Rewarding in Tobacco-Cessation in Heavy-Users Resistant to Previous Drug-Therapy and Conventional Counselling

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## Abstract

Tobacco is the greatest cause of cardiovascular and respiratory diseases and premature death. In this article we describe the efficacy of an easily applicable medical approach of; (a) thrice-daily tobacco-use for 1 month in heavy smoker that represent gradual tapering of habit and nicotine-dependence, (b) pulmonary and cardiovascular risk-identification at entry, and (c) medical rewarding, with disease stability, in tobacco-cessation after 1, 3 and 6 months. In the study we evaluated the efficacy of such protocol in 200 heavy-smokers that had failed previous drug-therapy and conventional counselling. Patients were subdivided into 4 matched groups of patients with: (a) chronic obstructive pulmonary disease (COPD), (b) cardiovascular diseases (CVD), (c) combined COPD & CVDs, and (d) those without them. The overall results indicated >90% cessation rate after 3 and 6 months yet was 74 and 87% in those without such diseases. In conclusion, tobacco cessation can be achieved, especially in high-risk patients, with such easily applicable medical protocol.

**Keywords:** Tobacco; Cigarette; Smokers; Cessation; Behavioral therapy; COPD; CVD

## 1. Introduction

Tobacco is the greatest cause of cardiovascular and respiratory diseases and premature death. In USA, it is responsible for more than 435,000 deaths annually. Nearly, 20% of adult Americans currently smoke, and 4,000 children and adolescents smoke their first cigarette each day. The societal costs of tobacco-related death and disease approach \$96 billion annually in medical

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expenses and \$97 billion in lost productivity [1]. Previous treatments included (a) behavioral counselling, (b) nicotine (gum, inhaler, lozenges, nasal spray and patch), and (c) drugs (Bupropion SR and Varenicline) [2]. They increased the rates of tobacco-cessation (TC) and hence supported by US-Medicaid program [3]. However, treatment was costly, relapses were common and long-term abstinence was limited [4]. Such phenomenon was attributed to nicotine dependence, inadequate motivation on exposure to smoking cues and side effects of drugs [5]. In this study, we evaluated the efficacy of an easily applicable medical approach in management of motivated tobacco-dependent (TD) patients who failed those conventional-behavioral and drug treatments.

## **2. Patients and Methods**

During the period 1<sup>st</sup> January 2020 to 31<sup>st</sup> December 2022, TD patients resistant to conventional-behavioral and drug treatments were included in the study. The study was conducted by Prof/ El-Reshaid medical clinic. The clinic was established in 1997 in the center of Kuwait City and has adequate diagnostic and therapeutic facilities to care for out-patients and in-patients with its affiliated hospitals.

### **2.1 Inclusion criteria**

Patients were included if they had: (a) age  $\geq$  21 years, (b) smoking history of >20 cigarette for >10 years, (c) adequate motivation for tobacco-cessation, (d) stable mental and medical disorders. On the other hand, patients handicapped with advanced pulmonary, ischemic heart disease, left ventricular failure, strokes and morbid obesity were excluded.

### **2.2 Initial assessment**

Included detailed history, physical examination, ECG, peak flow testing, laboratory tests (complete blood counts, TSH, glucose, urine routine and microscopy as well as liver, renal and lipid profiles) and chest x-ray. High resolution CT, pulmonary function tests and thallium coronary stress tests were done if indicated.

### **2.3 Group allocation**

At entry, TD patients were allocated to 1 of 4 follow up groups viz. (1) those with chronic obstructive pulmonary disease (COPD), (2) cardiovascular diseases (CVD) viz. cerebro-, coronary- and peripheral-vascular diseases, (3) combined (COPD & CVD) illnesses, and (4) those who lacked both.

### **2.4 Methods and protocol of TC**

Entailed 3 parts; (a) limiting cigarette consumption (CC) to 1 after each meal with a cup of coffee to decrease gradually habit-formation and nicotine-dependence, (b) using motivational medical information relevant to a patient's disease status and risk, and (c) addressing impediments to quitting (nicotine-withdrawal symptoms, weight gain, depression) and establishing easy telephone/electronic communication methods for early problem-solving counselling of future road blocks. Patients medical risk data included; (1) acute risks with shortness of breath due to exacerbation of asthma or bronchitis, increased risk of respiratory infections, harm to pregnancy, impotence, infertility, (2) long-term risks of heart attacks and strokes, lung and other cancers (e.g., larynx, oral cavity, pharynx, esophagus, pancreas, stomach, kidney, bladder, cervix, and acute myelocytic leukemia), end-stage pulmonary disease from COPD, osteoporosis, long-term disability, and need for extended care, and (3) environmental

risks with increased risk of lung cancer and heart disease in spouses; increased risk for low birth weight, sudden infant death syndrome, asthma, middle ear disease, and respiratory infections in children of smokers.

## 2.5 Follow up

Patients were assessed, after 1, 3 and 6 months, for their specific diseases and complications as well as their daily counts of CC. Peak flow testing, ECG, laboratory tests and radiological tests, pertinent to the patients' health need, were done during those visits.

## 2.6 Medical rewarding

The positive impact of TC was emphasized on the subsequent visits after 1, 3 and 6 months. There latter included detailed discussions on improvements in pulmonary function with regards shortness of breath, cough, wheeze, night sleep, decrease incidence of infections/hospitalizations and peak flow testing. Moreover, stability of cardiovascular status and decrease in physical disability were major factors in discussions.

## 2.7 Statistical analysis

SPSS statistical package version 25 was used for data entry and processing. The p-value  $\leq 0.05$  was used as the cut-off level for significance. Since all variables were normally distributed, they were expressed as means and compared using student's t-test. Comparison of changes with time, following therapy, was done using ANOVA test for repeated measures.

## 3. Results

A total of 200 TD patients had reached the endpoint of the TC-study at 6 months. They were equally divided into 4 groups according to their associated morbid conditions. The demographical profile of patients and impact of TC-protocol are summarized in TABLE 1. The 200 patients were adult males at  $46 \pm 6$  years who smoked cigarettes for  $128 \pm 8$  months. The was not a significant difference except for a relatively lower age, duration of smoking and the initial daily CC in those without COPD and CVD.

TABLE 1. Demographical data and reduction of daily cigarette consumption in the 4 tobacco-dependent groups.

	Co-morbid conditions groups				Total (n=200)
	COPD (n=50)	CVD (n=50)	COPD & CVD (n=50)	None (n=50)	
<u>Age:</u> (years)	$48 \pm 3$	$48 \pm 4$	$48 \pm 2$	$39 \pm 3$	46+6
<u>Duration of smoking:</u> (months)	$130 \pm 10$	$131 \pm 10$	$127 \pm 9$	$125 \pm 3$	128+8
<u>Daily cigarette consumption: *</u>					
At start	$41 \pm 9$	$38 \pm 9$	$46 \pm 8$	$31 \pm 3$	39+9
After 1 month	$7 \pm 2$	$7 \pm 1$	$5 \pm 2$	$11 \pm 2$	7+3
After 3 months	$4 \pm 1$	$3 \pm 1$	$3 \pm 1$	$8 \pm 1$	4+2
After 6 months	$3 \pm 1$	$1 \pm 1$	$1 \pm 1$	$4 \pm 1$	2+1
<u>% reduction of daily cigarette consumption:</u>					

At start	100	100	100	100	100
After 1 month	83	82	89	65	80
After 3 months	90	92	94	74	88
After 6 months	93	97	98	87	94

Abbreviations: COPD: chronic obstructive pulmonary disease; CVD: cardiovascular diseases

\* Significant changes with time in all groups ( $P < 0.00001$ )

### 3.1 Effect of TC protocol

The daily CC decreased dramatically, to 80%, by the end of 1 month of the protocol guidance. Moreover, such positive impact persisted and even reached 94% in 6 months.

### 3.2 Impact in different groups

The overall results indicated  $>90\%$  cessation rate after 3 and 6 months yet it was less and gradual 74% and 87% in those without such diseases.

### 3.3 Drop outs and side effects of therapy

A total of 236 smokers fulfilled the criteria of inclusion and hence were advised to participate in the study. However, at start, 21 patients politely refused the protocol for excessive fear and anxiety of TC despite multiple trials. During the protocol application, there was no significant withdrawal manifestations yet 15 patients were dropped out or excluded for lack of compliance. The drop outs were as follows; (a) 2 in COPD group, (b) 4 in CVD group, (c) 3 in COPD and CVD group, and (d) 6 in None group.

## 4. Discussion

TD are exposed to a higher risk of progressive COPD and CVD that culminates in premature disability and mortality [6]. Moreover, future predictions indicate that tobacco-related mortality and morbidity rates will substantially increase in coming years especially in adult males residing in low- and middle-income countries [7]. In our study TD smokers were adult males. Such vulnerable, potentially productive, population should present a major concern to health/social policymakers in our country [8]. Moreover, failure of previous programs indicates inadequate problem-solving skills by non-medical staff [9]. Our protocol of 1 cigarette at meal for 1 month provided: (a) respect to smokers long-term ( $>10$  years) habit-formation, (b) gradual tapering of nicotine-dependence with avoidance of “Abstinence teaching programs and those striving for total abstinence (Not even a single puff after the quit date), (c) avoiding replacing disease (TD) with another by using nicotine products and electronic cigarettes [10]. On the other hand, our protocol introduced teaching centered on medical reasoning viz. induction, progression and disabilities of COPD, CVD and cancers rather than negative social stigmata. Our approach of gradual TC provided our patients with an acceptable management of long-term disorder and the medical reasoning supported their future relapse-prevention. The limitations of our study are (a) the relatively small group populations, (b) generating data from outpatient medical patients, relating positively to their treating doctors, rather than general population, (c) its limitation of application to adult and compliant males. TC may be different in the elderly and females [11,12]. Fortunately, the drop out in our study population was  $<20\%$  and hence accepted [13]. Finally, it should be noted that TC may prove difficult in some patients since 50%-75% of the risk of nicotine addiction can be attributed to genetic factors [14]. In conclusion, tobacco cessation can be achieved, especially in high-risk patients, with such easily applicable medical protocol.

## 5. Conflicts of Interest

The authors declare that they have no potential conflict of interest related to the contents of this article.

## 6. Funding Source

The authors declare that they did not receive any funding from any institution related to this article.

## 7. Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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