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SPECIAL ARTICLE

Cigarette smoking in Serbia. Impact of the 78-Day NATO bombing campaign

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Summary

Purpose: *To estimate short-term and long-term influence of protracted stress caused by the NATO bombing of Serbia on self-reported cigarette smoking, we performed and analyzed smoking survey data.*

Materials and methods: *The survey included 320 adult citizens from Sombor, Novi Sad, and Belgrade, three cities that were bombed during the NATO campaign along with other Serbian target cities. We queried participants about their smoking habits before, during, and 8 years after the military intervention. We recorded smoking prevalence rates, intentions to stop smoking, and the age at which smoking began. We also recorded smoking history and cessation attempts.*

Results: *Prior to bombing, 48% of the women and 63% of the men were smokers. During the bombing period, smoking prevalence in male smokers increased significantly. During this period, 32% of the women and 36% of the men increased their smoking by as much as two packs of cigarettes per week. A month after the bombing, the rate of consumption returned to the prewar levels. At present, 44% of the women, and 59% of the men smoke. The average age of current smokers is 43 years (standard deviation /SD/, 14.4) for women and 45 (SD, 16.3) years for men. Female smokers expressed greater interest in quitting smoking than their male counterparts, and they were slightly more successful than men at maintaining abstinence (20 vs. 18%). The participants in our study acknowledged that a compounding factor for successful abstinence was information on depleted uranium (DU) and other pollutants introduced into the environment by the war.*

Conclusion: *Prolonged stress imposed by war causes a short-term increase in smoking prevalence in male smokers and higher cigarette consumption both in male and female smokers. Even though these increases dissipated after the war was over, the prevalence of smoking within the population of urban Serbia remains very high. Counseling and pharmacological support for abstinence relapse in Serbia were insufficient to sustain smoking cessation during the 8-year period after the NATO bombing. Motivation for smoking cessation stems primarily from governmental regulatory measures and awareness of the dangers to health posed by tobacco smoking.*

Key words: bombing of Serbia, cigarette consumption, smoking prevalence, stress

Introduction

Despite increased discussion of health risks associated with tobacco smoking more than 20 years prior to the recent civil war (1991-1999) there was no substantial reduction of smoking prevalence in Serbia and other parts of the former Yugoslavia. In the 1980s and the early 1990s, every second man and every third woman in the Serbian population were smokers [1]. Authorities in this country failed to emphasize the dangers of this habit, and established measures to control smoking were rarely put into practice. Smoking was culturally accepted across all social strata [2].

The civil war in Yugoslavia, the UN economic sanctions imposed on Serbia, and the 78-day NATO bombing campaign in 1999, which affected Serbia and Montenegro, abolished all government-initiated antismoking measures. In Serbia, the bombing attacks left more than 2,500 civilians dead, and destroyed many factories, bridges, electric networks, buildings, and re-

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fineries. Transportation was disrupted, unemployment increased, and many refugees are still unable to return to their homes in Kosovo, a southern part of Serbia. DU was used by the US and UK armed forces as a component of bullets [3] at 112 locations, mainly in Kosovo [4]. Around 30,000 DU projectile rounds were fired, and approximately 10 tons of DU debris dispersed to the atmosphere after explosions [5]. These particles were scattered not only within Serbia, but also to neighboring countries, including Hungary [6] and Greece [7].

Although cigarette smoking is a co-morbid factor that accompanies posttraumatic stress disorder (PTSD) and other psychological disorders [8,9], only a few studies have documented increased smoking by civilians during or after war, natural disasters, or other calamities. One such study was done with survivors of the September 11th terrorist attack in New York [10]. Because of the enormous psychological impact on the civilian population caused by the long lasting NATO bombing of Serbia, we wanted to assess its effect on cigarette use. Antismoking measures were absent during the UN sanctions on Serbia and for some time after the bombing campaign. Meanwhile, advertising and smuggling of cigarettes continued, and even children could easily acquire cigarettes [11]. Under these circumstances, not only were people exposed to radiation from DU and dangerous chemicals that polluted the air and water after destruction of refineries and chemical factories, but the potential health risks were compounded by increased cigarette consumption.

To estimate short-term and long-term influence of protracted stress caused by the NATO bombing of Serbia on self-reported cigarette consumption, we examined data from a survey conducted in Sombor, Novi Sad, and Belgrade, three cities that were bombed during the NATO campaign along with other Serbian target sites. We also recorded smoking prevalence rates, intentions to stop smoking, and the age at which smoking began.

Materials and methods

Study participants

We selected adult citizens (24 years of age and older) who lived in Sombor, Novi Sad or Belgrade at the time of the NATO bombing as study participants. We drew our population samples from these cities because they were far from Kosovo where, in addition to the NATO bombing, the rebellion forces were fighting with the Yugoslav Army, who was targeted by NATO air raids. The participants were selected randomly from households proximal to areas that were bombed within these cities. The number of adults in each household was determined, and one adult per household was randomly selected for an interview. All participants willingly participated in this study, and the overall response to the survey was 100 percent. The smokers claimed to remember very well the details of their smoking habits during the bombing period, and most of them reported that they did not sleep when the bombing was intensive. Consequently, they smoked and drank coffee throughout the night. A frequent remark was that "I do not worry about the risk of smoking when my life is at immediate risk."

Data collection and analysis

The institutional Review Board of the Department for Public Health in Sombor approved our questionnaire and the study protocol. Interviews were conducted by three medical doctors. The mean duration of face-to-face interviews was 21 minutes. We inquired about participants' presence in the city during the entire period of the NATO bombing. We also inquired about the participants' cigarette smoking. First, we asked whether the participant had ever smoked cigarettes, when he/she started to smoke, and whether they smoked now. All smokers were asked if they smoked during the week before the NATO bombing. We then asked them for the average number of cigarettes per day that they consumed before and during the NATO bombing. We asked them how many cigarettes per day they smoke now. An important question in our survey was "How many times have you tried to quit smoking?" In addition, we collected information about demographic variables, including age, gender, education, and employment. The smokers were asked if they could get enough cigarettes during the bombing period. Respondents who experienced traumatic events unrelated to the bombing (e.g. the death of a spouse) within a few months before or after the bombing attack were disqualified.

A 95% confidence level was employed for analyses. The significance among prevalence proportions was tested by the Fisher's exact test or McNemar's test for paired observations. Yates correction with one degree of freedom was applied [12]. Data were analyzed with statistical software (GraphPad Instat) and $p<0.05$ was considered statistically significant.

Results

Among 320 adults surveyed, 4 individuals were excluded from our analysis; 3 were disqualified because of major traumatic events unrelated to the bombing,

and one was disqualified because of damaged memory. The sample included 176 women with a mean age of 41 years (SD, 16.3), and 140 men with a mean age of 43 (SD, 15.8) years. The group of current smokers included 83 men and 78 women subdivided into the following age groups: 24-29 (17 men and 14 women), 30-39 (24 and 13), 40-49 (10 and 18), 50-59 (23 and 24), and over 60 years (9 and 9).

Table 1 shows smoking prevalence data for our sample populations. The proportion of self-reported smokers prior to the bombing was 48.8% for women and 63.6% for men. During the bombing period, 7 women and 10 men started to smoke, but 3 women and 3 men from these two groups stopped smoking soon after the bombing ceased. One woman, who was a smoker before the bombing, quitted during the bombing and has remained abstinent. This increase in smoking prevalence during the bombing period was significant ($p<0.05$) for male smokers. At present (8 years after the bombing), 44.3% of the women and 59.2% of the men are still smokers. Among the current smokers, 9% of the women and 10% of the men had less than a high school education. Half the women and 48% of the men had a high school diploma, and 41% of the women and 42% of the men were educated beyond high school.

Among those reported smokers who smoked a week before the bombing, 32% of the women and 36% of the men increased their consumption of cigarettes by an extra 2 packs or more cigarettes per week. This increase in cigarette use lasted throughout the campaign, but within a month it decreased to the prewar level. Despite assurances of all participants that they remembered very well how many cigarettes they smoked in those years past, the failure in memory after the traumatic events surrounding a war may be the cause for not quite precisely accurate numbers. Table 2 shows the average daily cigarette consumption by women and men before and during the NATO bombing, and at present. Two smokers (retired women) reported that they would have smoked more if cigarettes had been available during the bombing period.

Table 3 shows the age of smoking initiation (when the study participants first became daily smokers); the data include both present smokers and those who had quit by the time of the survey. Most of our participants apparently started smoking at 20 years of age and relatively few had tried to quit early in their smoking career.

The primary reason underlying the participants' decision to quit smoking was their concern about the health effects, and they frequently expressed concern about DU contamination as compounding toxic factor. Among the present and former female smokers, 34.8% had never tried to quit smoking. Male smokers had less interest in quitting, and 40.5% of the male participants had never tried to quit the habit. Table 4 shows the number of times participants tried to quit smoking before achieving successful abstinence. Our data indicate a relatively high failure rate, which likely reflects both the difficulty of overcoming this prevailing habit and the lack of adequate support systems to help achieve abstinence.

Table 1. Smoking before, during, and after NATO bombing

Period	*Smoking prevalence (95% CI)*
Before bombing	
Females	0.488 (0.41-0.56)
Males	0.635 (0.55-0.72)*
During bombing	
Females	0.522 (0.45-0.60)
Males	0.707 (0.62-0.78)*$^{+}$
Present	
Females	0.443 (0.37-0.52)
Males	0.592 (0.51-0.68)*

CI: confidence interval; *: significant difference ($p<0.05$) between women and men before bombing, during bombing, and at present; $^{+}$: significant difference ($p<0.01$) for smoking prevalence in male smokers before and during the bombing

Table 2. Weekly cigarette consumption before, during, and after NATO bombing

Gender and period relating to bombing	*Packs of cigarettes per week*					*Total no. of smokers*
	1-2	*3-4*	*5-7*	*8-11*	*12-15*	
Women						
Before	17	20	41	5	3	86
During	7	23	36	17	12	95
Present	15	30	31	2	0	78
Men						
Before	10	37	13	16	13	89
During	6	28	26	21	18	99
Present	11	30	16	15	11	83

Data are average numbers of cigarettes consumed weekly

Table 3. Age at onset of daily smoking

Gender	*Percent of persons who became smokers at the following age (years)*						
	<13	*14-16*	*17-20*	*21-25*	*26-30*	*31-40*	*>40*
Male	2.5	24.4	43.6	19.3	9.2	–	0.8
Female	1.8	10.7	51.8	20.5	5.3	5.3	4.5

Both present and former smokers are included. There were altogether 119 male and 112 female smokers

Table 4. Number of smokers who tried to stop smoking

Participants who tried to quit smoking	*Percentage of previous attempts to quit smoking*[+]				*Total (%)*
	1	*2-4*	*5-10*	*>11 trials*	
Females					
Successful	10.7	7.1	1.8	0.9	20.5
Failure	6.2	21.4	11.6	2.7	41.9
Males					
Successful	5.9	7.5	4.2	0.8	18.4
Failure	6.7	17.6	4.2	0.8	29.3

[+]Two male smokers received counseling guidelines and pharmacological treatment with bupropion for relapse prevention. More than a third of male and female smokers tried other types of help for smoking cessation, including folk medicines and/or acupuncture

Discussion

The results of our study indicate an increase in cigarette consumption by both male and female smokers during the NATO military operations in Serbia. In the majority of the cases, this enhanced cigarette consumption returned to the prewar level soon after the bombing. Unlike certain other disasters [13-15], this man-made disaster produced significant effect on smoking prevalence in male smokers during this military campaign.

The short-term increase in cigarette consumption that we recorded indicates the exacerbation of cigarette dependence during disaster. As in other catastrophes [13,16], stress is the main cause of increased cigarette use. However, the increased consumption assumes that the supply of cigarettes is not interrupted. Governments try to do all they can to deliver tobacco to their soldiers [17] in order to help them resist invasion or to become better invaders. The Serbian government allowed smuggling of cigarettes during the UN sanctions and NATO intervention in order to appease its despondent citizens and preserve the system. Also, during that period, there were no counter measures, such as negative advertising, taxation, smoke-free legislation, and litigation against the industry. Eight years post-bombing, when the situation returned towards normal, the number of smokers decreased slightly.

We estimate that 9.6% of the women and 11.4% of the men quitted smoking over that post-bombing period (Table 1). Perhaps renewal of intensive antismoking campaigns [11] along with certain governmental regulatory measures and awareness of health-dangers of military-induced pollution (including neoplastic disorders) contributed to this reduction. Presumably, the end of war and economic blockade of Serbia also created a psychologically better environment for the people of this despondent country.

Smoking prevalence among men and women in urban populations of the former Yugoslavia is very high regardless the level of education. Even physicians, who are well aware of the health risks, continue to smoke. The prevalence was higher for urban than for rural areas. A 1992 survey of the village populations in Northern Serbia recorded the proportion of smokers among men and women aged over 40 years as 46% and 22%, respectively [18]. These data indicate that smoking increased in the village populations of this area long before the military conflicts in Yugoslavia began. A survey done in 2003 indicates that every second man (48%) in Serbia and every third woman (33%) are smokers [1].

We found that both men and women started smoking at an early age. The fact that smoking becomes so prevalent among teenagers indicates a need for rigorous application of education and various other control measures. Measures designed by the World Health Organization's Framework Convention on Tobacco Control (FCTC) should be put in place by the Serbian government. According to Jenkinson [19], medical advice to smokers to quit their habit is frequently an

inadequate tool, but it may work if the individual seeks professional help to quit or if other medical conditions prompt the patient to stop smoking. Unfortunately, nicotine replacement therapy or the more efficacious varenicline therapy [20] is not available in Serbia; only bupropion can be obtained. For these reasons, high intensity interventions [21,22] for smoking cessation are not feasible, and few smokers in our study population who wanted to quit smoking (Table 3) had any professional help in maintaining abstinence.

January 11th 2008 marked the 44th anniversary of the US surgeon general's report on smoking and health. During 40 years of an antismoking campaign, the smoking rate of adults in the USA decreased from 42% to 23% [23]. Many (23.7%) Yugoslav immigrants to the USA, who were smokers upon their arrival, stopped smoking within less than 5 years of acculturation [24].

In order to further reduce the prevalence of smoking in Serbia, the FCTC measures should be fully implemented, nicotine replacement must be available and proper antismoking education widely applied. Smoking causes much greater harm generally than arterial hypertension, but primary care physicians rarely devote as much attention to smoking as they do to other causes of hypertension. Cessation interventions should be included as needed in routine health care [25], especially before elective surgery and during the postoperative period. Once relatively modest financial resources can be parlayed into larger tobacco control initiatives, it may be possible to improve the general health of many more Serbian citizens.

We may conclude that, according to the self-reported cigarette consumption, prolonged stress imposed by the NATO bombing campaign in Serbia caused a short-term increase in smoking prevalence in male citizens and higher cigarette consumption both in male and female smokers. Even though these increases dissipated after the war was over, the prevalence of smoking within the population of urban Serbia remains very high.

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