A Survey of Lung Cancer in Two Main Centers of Turkey as a Country with a High Smoking Prevalence

SİGARA İÇME PREVALANSININ YÜKSEK OLDUĞU ÜLKEMİZDE İKİ MERKEZLİ BİR ÇALIŞMA İLE AKCİĞER KANSERLİ HASTALARIN SİGARA İLE İLİŞKİLİ VERİLERİNİN İNCELENMESİ

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Summary

While the trend in cigarette consumption in some developed countries is downward, it is upward in many developing countries. Compared with developed countries, more men and fewer women currently smoke in these countries. The aim of this study was to investigate the prevalence and the characteristics of the habit of smoking in patients diagnosed as lung cancer (LC) and to analyze the relationship with the pathologic diagnosis in our patient population. This hospital-based study was carried out between 1990-1996 in two hospitals. 1046 patients were diagnosed as having LC, 966 were males (92.2 %), and 80 (7.6 %) were females. At the time of diagnosis among males 82.8 % were current smokers (CS), 11.7 % were ex-smokers (ES defined as abstinence from smoking for one year or more), and 5.5 % were non-smokers(NS) at the time of diagnosis; among females 16.3% were CS, 7.5% were ES, 76.3% were NS. The period of abstinence in the ES was 10 years or less in 77% of patients.

Among male patients, squamous cell carcinoma was the most frequent tumor type among the CS group (46%) while adenocarcinoma (45.28%) was the most frequent type in NS group. In contrast, among female patients, the most frequent tumor types among CS were small cell (53.8%) and adenocarcinoma (38.5%) whereas adenocarcinoma(36%) was the most common histological types in NS group. These results indicate that, smoking was more prevalent among males with lung cancer than among female patients and ES LC patient rates were very low in this study group suggesting that in Turkey the great majority of male lung cancer patients are CS and female lung cancer patients are NS.

Key Words: Lung cancer, Smoking habit, Ex-smoker, Nonsmoker, Current smoker

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Özet

Günümüzde gelişmiş ülkelerde sigara içme prevalansı azalırken gelişmekte olan ülkelerde artmaya devam etmektedir ve gelişmiş ülkelerle karşılaştırılınca bu ülkelerde erkeklerde sigara içme oranı kadınlardan çok daha fazladır. Bu çalışmanın amacı akciğer kanserli hastalarda sigara içme prevalansı ve özelliklerini ve bunların patolojik tanı ile ilişkisini araştırmaktır. Çalışma 1990 ve 1996 yılları arasında iki merkezde yapılmıştır. Çalışmaya alınan 1046 hastadan 966 (%92.2) si erkek, 80 (%7.6) i kadındı. Tanı sırasında erkeklerin %82.8'i current smoker, %11.7 si ex-smoker,%5.5'i nonsmoker'dı. Kadın hastaların ise %16.3'ü current smoker, %7.5'u ex-smoker, %76.32ü nonsmoker'dı. Ex-smoker hastaların %77 sinde sigarayı bırakma süresi 10 yılın altındaydı. Erkek current smoker hastalarda squamöz hücreli akciğer kanseri en sık görülürken (%46) nonsmoker hastalarda adenokanser en sık görülüyordu(%45.28).

Kadın hastalarda ise current smoker'larda en sık görülen tümör tipleri küçük hücreli akciğer kanseri (%53.8) ve adenokanser (%38.5) olup nonsmoker'larda en sık görülen akciğer kanseri tipi ise adenokanserdi (%36).

Bu sonuçlar gelişmiş ülkelerin aksine, ülkemizde akciğer kanserli erkek hastalarda sigara içiminin kadınlardan çok daha fazla olduğunu ve halen akciğer kanserli hastalarda ex-smoker oranlarının çok düşük olduğunu düşündürmüştür.

Anahtar Kelimeler: Akciğer kanseri, Sigara alışkanlığı, Ex-smoker, Nonsmoker, Current smoker

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Each year about 3 million people die from smoking-related diseases in economically developed countries, and half of them before the age of 70 (1). Among men in developed countries, smoking is estimated to be the cause of 40-45% of all

cancer deaths and 90-95% of lung cancer deaths (2). Studies have demonstrated that, cigarette smoking is the principal cause of lung carcinoma. Approximately 87% of lung carcinomas is attributed to exposure to tobacco, and the relative risk for lung carcinoma in current smokers is as much as 20-fold greater than for those who have never smoked (3).

Smoking increased between 1945 and 1965 in all the countries, and from 1965 to 1985 it did not decline substantially in any country and continued to increase in many. Despite an overall decline in the number of smokers in the United States and much of the developed world, the prevalence of cigarette smoking continues to increase in many developing countries (4).

On the other hand, the histologic distribution of lung cancer is markedly different for ever and never smokers. Adenocarcinoma comprises 30% of LC among men and 40% of LC among women active smokers (5,6). In contrast, 60 to 80% of LC in nonsmoking men and women are adenocarcinomas (7,8). There is less information on the histology of lung cancer among former smokers (9,10).

The aim of this study was to investigate the prevalence and the characteristics of the smoking habit among patients diagnosed as LC and to analyze the relationship with the pathologic diagnosis in our patient population.

Materials and Methods

This hospital-based study was carried out between 1990 and 1996 in two hospitals in Ankara (Gazi University Hospital and Atatürk Chest Diseases and Surgery Center). 1046 patients were diagnosed as having LC, 966 were males (92.2%) and 80 (7.6%) were females. For each patient the hospital chart was examined in order to determine the diagnosis and the absence or presence of smoking through the patient's lifetime.

The histologic type of LC was obtained from the pathology report or the discharge summary for each patient. Those patients in whom the diagnosis was not primarily LC were excluded from the study.

Lifetime exposure to tobacco smoke was assessed according to current smoking status, number of cigarettes smoked per day, and number of years since quitting (for ex-smokers). Nonsmokers were defined as patients who had smoked fewer than 100 cigarettes in their lifetime. Current smoking was defined as having smoked and smoking one or more cigarettes per day for at least one year prior to the time of diagnosis. Ex-smokers were defined as having quit smoking for at least one year prior to the time of diagnosis. One way Anova test was used to determine if there were any statistically significant differences among CS, ES from the viewpoint of patient characteristics.

Results

A total of 966 male cases and 80 female cases were interviewed. Among the men, 800 (82.8%) were CS, 113 (11.7%) were ex-smokers and 53 (5.5%) were non-smokers. Among the women 6 (7.5%) were ex-smokers, 61 (76.35) were NS, and 13 (16.3%) were CS. The proportion of nonsmokers was 76.3% of all female patients and 5.5% of all male patients. Table 1 and 2 show the smoking habits of the male and female lung cancer patients.

Table 3 summarizes selected smoking history variables for CS and ES. Among the patients , the mean age was 56.39 (10) years for CS, 61.42 (9.14) years for former smokers and 57.92 (12.37) years for nonsmokers. 26.1% of CS developed LC at an age< 50 years compared with only 16% of long

Table 1. Smoking habits in male and female lung cancer patients

	Male (%)	Female (%)
Non Smoker	53(5.5%)	61(76.3%)
Current Smoker	800(82.8%)	13(16.3%)
Ex-smoker	113(11.7%)	6(7.5%)
Total	966	80

Table 2. Years of cessation in ex-smoker patients

Ex-smoker (years since cessation)	Male (%)	Female (%)
1-5	51(44.8%)	3
6-10	36(31.9%)	1
11-15	20(17.7%)	1
16-	6(5.4%)	1

Table 3. Selected characteristics of CS and ES in lung cancer patients*

Characteristic	CS	ES	p
Age started smoking	20.48(8.25)	23.80(9.68)	**
Cigarettes per day	27.97(12.6)	30.15(15.24)	
Years smoked	36.4(11.06)	29.95(12.61)	**
Age at diagnosis	56.39(10.0)	61.42(9.14)	**

* Expressed as mean (standard deviation)
** $p < 0.05$

term ES(>10 years). NS and CS patients were significantly younger than ES ($p<0.05$).

Table 4 presents the distribution of histologic type by smoking status. Among men, adenocarcinoma comprised 11.2% of CS, 21.3% of ES and 45.28% of NS (Table 4). Among women, adenocarcinoma comprised 38.5% of CS, 16.6% of ES and 36% of NS.

Among male patients, squamous cell carcinoma was the most frequent tumor type in CS group(46%) while adenocarcinoma (45.28%) was the most frequent type in NS group. In contrast the most frequent tumor among female CS patients was small cell carcinoma (53.85%). Whereas adenocarcinoma (36%) was the most common histological type in female NS. But the patient number was very small in this group. Table 5 shows the histologic distribution of ES with lung cancer according to time since quitting smoking. The distributions for CS and NS are also listed for comparison. Squamous cell carcinoma was underrepresented in ES with the longest smoking cessation interval. The proportion of patients with adenocarcinoma decreased progressively with time since quitting smoking. But in all groups, especially in long term quitters the proportion of nonsmall cell cancer was very high.

24% of smokers began to smoke below 15 years age, whereas 51.5% of smokers began to smoke below 20 years age. The period of abstinence in the ES was 10 years or less in 77% of the patients (Table 2) Additionally, we observed that 89% of the patients always smoked, and of these, 94.5% were heavy smokers (more than 20 pack-years).

Discussion

Our results indicate that, among LC patients diagnosed between 1990 and 1996, 82.8 of the male patients were CS, whereas 76.3 of the female patients were NS. These results suggest that male LC patients are now more likely to be CS than ES or NS at the time of diagnosis. 11.7% of male LC

Table 4. Distribution of histologic type by smoking status

	CS%		ES%		NS%	
Histologic type	Male	Female	Male	Female	Male	Female
Squamous cell	367(45.9%)	1(7.7%)	56(49.4%)	2(33.3%)	9(16.98%)	6(9.8%)
Adenocarcinoma	90(11.2%)	5(38.5%)	24(21.3%)	1(16.6%)	24(45.28%)	22(36%)
Small cell	213(26.6%)	7(53.8%)	22(19.5%)	3(50%)	9(16.98%)	15(24.2%)
Large cell	17(2.2%)		2(1.8%)		2(3.77%)	2(3.3%)
Nonsmall cell	97(12.1%)		7(6.2%)		9(16.98%)	15(25%)
Mixed	16(2%)		2(1.8%)			1(1.7%)
Total	13(16.3%)		113(11.7%)	6(7.5%)	53(5.5%)	61(76.3%)

Table 5. Distribution of histologic type by duration of smoking cessation

		ES (%) years since cessation		
Histologic Type	CS n (%)	1-10	11-25	NS%
Adenocarcinoma	89 (11.1)	22(23.97)	5(17.85)	43(37.7)
Small cell	221(27.1)	18(19.78)	6(22.06)	26(22.9)
Squamous cell	374(45.3)	44(48.35)	11(39.2)	16(14)
Large cell	16(2.1)	2(2.2)	3(11.5)	4(3.5)
Nonsmall cell	113(13.9)	5(5.49)	3(11.5)	25(21.9)

patients and 7.5% of female LC patients were ES. In contrast female LC patients were more likely to be NS than current or ES in our LC patients. Furthermore the number of ES patients was very low in this patient population. In contrast, studies performed after 1990 in developed countries demonstrated that LC patients are more likely to be ES at the time of diagnosis. Roland et al. reported that 55.9% of their lung cancer patients were ES (defined as abstinence for 6 or more weeks) (11). Romes et al. reported that among males 22.7% were ES (12). In a large LC study in western Europe, Lubin and Blot noted that 29.7% of the 6920 male patients and 20.7% of the 884 female patients were ES (13). Morabia and Wynder noted even higher percentages of ES (43.6% for men, 28.4% for women) (14). In another study from U.S. Tong et al reported that 42.7% of the LC patients (diagnosed between 1985 and 1992 years) were ES (10). ES constitute a large and growing segment of the U.S. population. In the last decade, approximately 1.3 million people in the U.S. quit smoking each year, indicating that public health efforts aimed at achieving smoking cessation have had considerable success (15). There are now approximately 44 million ES in the U.S., and surveys suggest that as many as 50% of adults are ES (16). In contrast to our country, in the US, the LC death rate is declining among younger men (those under 55) and the overall male LC mortality rate appears to have peaked. This change in male LC mortality is directly related to increased rates of quitting and reduced rates of smoking initiation (17).

Turkey ranks fifth in the world's in total tobacco production, and is the worlds leading producer of oriental tobacco (2). In Turkey cigarette consumption increased 10% during the 1970 and 1985 period and the prevalence of cigarette smoking was 43.5% in 1988 (among adults 15+), with 63% of the male and 24% of the female population smoking (18). Even now, cigarette consumption per person in Turkey has become one of the highest in Europe (19,20). According to 1986 surveys among students, smoking prevalence among 15-19 years-old students, 31% of males and 5% of females smoked. A 1991 survey among university students aged 20-24 years revealed that 47% of females and 31% of males in that group smoked (2). It has been estimated that the frequency of smoking for women and for young males has been rising still.

One of the most striking results of the present study was the proportion of the female LC patients. Only 7.6% of the LC patients were female and 24% of them were smoker (CS or ES). In cross-sectional studies conducted in Turkey, the frequency of smoking has been found to be much higher for men than for women. As levels of education and urbanization increase and Western values enter daily life, traditional culture, which puts pressure on women and children not to smoke has been losing its effect. With increasing education and urbanization, the frequency of smoking for women and for young males has risen. Findings of a two fold difference between male and female smoking rates, and the steeper increase in smoking rates for females according to curriculum year, seem to reflect these general trends in the population. With respect to male:female smoking ratios among medical students, Turkey was similar to Asian and African countries, but different from European countries, the US and Australia.

Epidemiologic studies over the past several decades have shown that histologic types of LC vary in their respective etiologies. Smoking is a stronger risk factor for squamous cell and small cell carcinomas and a weaker risk factor for adenocarcinomas (23). In our study, squamous cell carcinoma was the most common cell type among both CS (45.28%) and male ES (49.4%), whereas adenocarcinoma was more common among lifetime NS men (45.28%) and women (36%). On the other hand, in our study most cases in the nonsmall cell carcinoma group were poorly differentiated nonsmall cell carcinomas that could not be more specifically classified on the basis of the available material. If classifiable, many of the nonsmallcell carcinomas may have been adenocarcinoma or squamous cell types. Therefore, the percentage distributions for those cell types in table 4 may be artificially low especially for adenocarcinoma.

In addition, we still lack data on large numbers of ES who have been abstinent for very long periods to determine with accuracy the histologic distribution of lung cancer according to elapsed time since quitting smoking. One of the aims of the study was to determine whether or not the histology

among ES varies according to the number of years since quitting. But only 119 patients (12.77%) with LC were ES among the smoker LC patients (932) and only 0.6% of them were female. For this reason figures were not enough to conduct satisfactory analysis. We noted that, the proportion of squamous cell carcinoma decreased progressively with increasing length of time elapsed since quitting smoking. This finding is supported by other studies. Tong et al reported that , the histologic distribution of lung cancer for those who had quit smoking more than 20 years ago was not significantly different from that of NS but it was significantly different from that of CS and from those who quit smoking fewer than 10 years before diagnosis (10). Muscat and Wynder reported that, for men and especially for women who quit smoking more than 25 years before diagnosis, there was a sharp decrease in squamous cell carcinoma. The percentage of small cell carcinoma decreased indirectly in proportion to the number of years that elapsed since quitting smoking (9).

In our study the CS presented with LC at a mean age of 56 years, whereas the ES had a mean age of 61 years at presentation. ES were significantly older than CS. 26.1% of CS developed LC at age <50 years compared with only 16% of ES. It has been previously reported that, stopping smoking not only reduces the risk of LC but also delays its age of onset (9,23). Tong et al reported median age of 63 for ES which was higher than that for CS (59 years). In another study Munavvar et al noted that, CS presented with lung cancer at a median age of 65 years, whereas the long term ES (who quit smoking more than ten years ago) had a median age of 72 years at presentation. In the same study the NS had a median age of 81 years at presentation, significantly older than the CS or ES.

In conclusion these results showed that, in the early 1990s males with lung cancer had higher smoking prevalence than female patients and ES lung cancer patient rates were very low in the group analyzed in this studys suggesting that the great majority of lung cancer patients are CS and female lung cancer patients are NS in Turkey. This pattern is similar to the pattern discovered in other developing countries and suggests that LC patients will continue to increase in this country in the future.

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