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ORIGINAL ARTICLE

The association between personal habits and bladder cancer in Turkey

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Abstract
Aims In this study, we analyzed the effect of Turkish coffee and black tea consumption, alcohol intake and smoking on bladder cancer.
Methods A total of 164 patients with bladder tumors and 324 individuals without primary tumors were included in the study. The habits of coffee and tea consumption, alcohol intake and smoking were queried.
Results No association was found between bladder cancer and drinking coffee ($p = 0.89$) and tea ($p = 0.37$), but alcohol intake was found to be associated, with an odds ratio (OR) of 1.85 (95% CI 1.15–2.96; $p = 0.009$). While there was a relationship between bladder cancer and smoking and quitting smoking (OR: 4.84 [95% CI 2.93–8.00; $p < 0.001$] and OR: 4.10 [95% CI 2.41–6.97; $p < 0.001$] respectively), the associations between bladder cancer and smoking and quitting smoking were similar (OR: 1.18, 95% CI 0.74–1.86; $p = 0.477$). Smoking <10 cigarettes a day created an OR of 2.14 (95% CI 1.11–4.12; $p < 0.001$); 10–20 cigarettes an OR of 4.50 (95% CI 2.74–7.37; $p < 0.001$); >20 cigarettes an OR of 14.85 (95% CI 6.83–32.27; $p < 0.001$); smoking by inhaling the smoke an OR of 4.72 (95% CI 2.94–7.59; $p < 0.001$), and smoking by not inhaling the smoke an OR of 3.34 (95% CI 1.75–6.38; $p < 0.001$). The associations between bladder cancer and inhaling smoke and not inhaling smoke were similar (OR: 1.41, 95% CI 0.85–2.48; $p = 0.228$).
Conclusion We found that smoking and alcohol consumption are closely connected with bladder cancer. Our data showed that not inhaling the smoke was as much associated with bladder cancer as inhaling the smoke. The association between smoking and bladder cancer lasts after quitting smoking.

Keywords Bladder cancer · Epidemiology · Personal habits

Introduction

Bladder tumors are the second most frequent form of urinary tract cancer [1]. About 90% of bladder tumors are transitional cell carcinomas [2]. They are very rarely seen before the age of 40, and the incidence increases after the age of 70 [3].

The relation between bladder tumors and coffee and black tea consumption is not yet clear [4–6]. There are articles reporting the relation between alcohol intake and bladder tumors [7, 8]. It is known that smoking causes bladder tumors and the relative risk in smokers is about 3-fold greater than that in nonsmokers [9].

Determining the relationship between bladder cancer and various habits, and also the prevention

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of the effects of detrimental exogenous chemical agents on individuals through personal habits is an important issue for physicians working in preventive health care. In this study, we analyzed the effect of Turkish coffee and black tea consumption, alcohol intake and smoking on bladder cancer.

Materials and methods

This study was performed on patients treated in the Second Urology Clinic of Ankara Diskapi Training Hospital between January 2001 and January 2006. This study is an analytic study of the case–control type. Patients with primary bladder tumors were included in the study as the case group. The control group was selected sequentially from patients without bladder tumors and hematuria of unknown etiology. Patients with any other cancers were excluded from the study. All the patients in the two groups were over 40 years of age.

When the case–control number of the study was calculated with 95% safety and 80% power, and when the smoking prevalence in the population was taken as 60%, it was found that there should be 94 controls and 47 cases (with the ratio of controls:cases 2:1), in order to find a 3.5-fold risk (OR). In the study, 164 cases and 324 controls were found. The face-to-face interviews were used. Age, gender, place of residence, educational status, marital status, occupation, habit of Turkish coffee and black tea consumption, alcohol intake and smoking were determined. Patients who had at least two cups of Turkish coffee (50 cc), five glasses of tea (100 cc) or 175 cc 35% alcoholic beverages (Turkish raki) per day for more than 20 years were selected in both groups.

The data of the study were coded according to the data coding forms, and were analyzed using the EPI-INFO statistical package. Odds ratios and 95% confidence intervals were calculated. Data analyses were performed using SPSS 11.5 package. Definitive statistics were expressed as median (minimum–maximum) and frequency (%). Chi-squared or Fisher's exact test was used for categorical comparisons. Odds ratios and 95% confidence intervals for the factors that might have an effect on bladder cancer were calculated. All results with $p < 0.05$ were accepted as statistically significant.

Results

Demographic data were similar in the case and the control groups and are shown in Table 1.

The consumption of Turkish coffee and black tea and alcohol intake seen in the case group were 46.3%, 90.2%, and 24.4%, and in the control group 45.7%, 92.6%, and 14.8% respectively. Odds ratios and 95% confidence intervals were 1.02, 0.70–1.5 ($p = 0.89$) for coffee consumption; 0.74, 0.38–1.43 ($p = 0.37$) for black tea consumption, and 1.85, 1.15–2.96 ($p = 0.009$) for alcohol intake.

The type of tobacco consumed in our study is the yellow tobacco grown in Turkey. The smokers' group was defined as those who had been smoking for more than 20 years. The patients who smoked for more than 20 years and who quit smoking at least 3 years ago were named as quitters' group. Bladder cancer in the smokers' group compared with the nonsmokers' group was found to be greater and the difference was statistically significant (OR: 4.84, 95% CI 2.93–8.00; $p < 0.001$). In addition, bladder cancer in the quitters' group was also found to be greater and statistically significant compared with nonsmokers (OR: 4.10, 95% CI 2.41–6.97; $p < 0.001$). No difference was found as regards the relation between bladder cancer and the smokers' and quitters' groups (OR: 1.18, 95% CI 0.74–1.86; $p = 0.477$).

Table 1 Demographic composition of cases and controls

	Cases ($n = 164$)	Controls ($n = 324$)	p
Age (years)	64 (40–88)	61 (43–87)	0.072
Number of females	20 (12.2%)	56 (17.3%)	0.143
Localization			
City	104 (63.4%)	216 (66.7%)	0.140
Town	16 (9.8%)	44 (13.6%)	
Village	44 (26.8%)	64 (19.8%)	
Years of education less than 8	148 (90.2%)	292 (90.1%)	0.966
Marital status			
Married	156 (95.1%)	296 (91.4%)	0.286
Widows/ widowers	2 (1.12%)	10 (3.1%)	
Single	6 (3.7%)	18 (5.6%)	

Among the case group, 17.1% never smoked, 12.2% smoked fewer than 10 cigarettes/day, 51.2% smoked between 10 and 20 cigarettes/day, and 19.5% exceeded 20 cigarettes/day, while these were 48.1%, 16.0%, 32.2%, and 3.7% in the control group respectively ($p < 0.001$). There was a relationship between bladder cancer and smoking by inhaling deeply (OR: 4.72, 95% CI 2.94–7.59; $p < 0.001$), and a similar relationship was also detected in smoking by not inhaling (blowing out) (OR: 3.34, 95% CI 1.75–6.38; $p < 0.001$). There is no statistically significant difference between those smoking by inhaling and those smoking by not inhaling (OR: 1.41, 95% CI 0.80–2.48; $p = 0.228$). Table 2 shows the data related to alcohol intake, smoking, and bladder cancer.

Discussion

Bladder tumors recurring frequently usually require multiple operations and long follow-up periods which cost large amounts of money. Prevention of bladder cancer is more economical than treating it. Thus, epidemiological studies for the etiology of bladder cancer are important, because it is a disease whose cause is partially known to be preventable to a certain degree.

The role of the coffee consumption in the etiology of bladder cancer is controversial. It was found in our study that Turkish coffee consumption was not associated with bladder cancer ($p = 0.89$). Although it was reported that coffee consumption created a very small risk in the etiology of bladder cancer in a meta-analysis of 14 studies [5, 10], it was also suggested in those studies that smoking might also be a factor [11]. In our study, black tea consumption was not associated with bladder cancer ($p = 0.37$). In a meta-analysis, no relationship was found between black tea consumption and bladder cancer [7]. There are studies reporting that it even reduces the risk of bladder cancer [12].

We showed that alcohol intake was associated with bladder cancer in our study ($p = 0.009$). In our society, alcohol consumption is not very high for

Table 2 Association of alcohol intake and smoking with bladder cancer risk

	Case ($n = 164$)	Percentage	Control ($n = 324$)	Percentage	p	OR	95% CI for OR	
							Lower bound	Upper bound
Alcohol consumption								
Never	124	75.6	276	85.2	0.009	1	–	–
Yes	40	24.4	48	14.8		1.85	1.15	2.96
Smoking								
Never*	28	17.1	156	48.2	<0.001	1	–	–
Quitted	56	34.1	76	25.5		4.10	2.41	6.97
Yes	80	48.8	92	28.3		4.84	2.93	8.00
Number of cigarettes/day								
Never**	28	17.1	156	48.1	<0.001	1	–	–
<10***	20	12.2	52	16.0		2.14	1.11	4.12
10–20†	84	51.2	104	32.2		4.50	2.74	7.37
>20	32	19.5	12	3.7		14.85	6.83	32.27
Type of smoking								
Nonsmoker††	28	17.1	156	48.1	<0.001	1	–	–
Inhaling the smoke	112	68.3	128	39.5		4.72	2.94	7.59
Not inhaling the smoke	24	14.6	40	12.4		3.34	1.75	6.38

* Never vs. Quitted, Never vs. Yes Group and Never vs. Yes + Quitted ($p < 0.001$)

** Never vs. <10 cigarettes ($p < 0.05$), 10–20 cigarettes ($p < 0.001$) and >20 cigarettes ($p < 0.001$)

*** <10 cigarettes vs. 10–20 cigarettes ($p < 0.05$) and >20 cigarettes ($p < 0.001$)

† 10–20 cigarettes vs. >20 cigarettes ($p < 0.001$)

†† Nonsmoker vs. Inhaling the smoke and Nonsmoker vs. Not inhaling the smoke group ($p < 0.001$)

religious reasons. Because the number of patients who consume alcohol was small within the study group, we believed that the interpretation of this result required caution. In many studies no increase in the risk of bladder cancer specific to the total amount consumed and the type of alcohol was found [7, 8, 10, 13]. But it was found that the risk increased with alcohol intake in a meta-analysis [14] and a prospective study [15].

The relationship between smoking and bladder cancer has been under investigation for many years. There are about 3,800 chemical substances and more than 60 carcinogens in tobacco. 2-Naphthylamine and 4-aminobiphenyl are the leading candidates as the specific etiological agents [16, 17]. In our study, there was a significant relationship between bladder cancer and smokers and people who had quit smoking ($p < 0.001$). It was seen that this association was related to the number of cigarettes smoked, and it increased much more in those smoking >20 cigarettes per day ($p < 0.001$). It was also found that there was a significant relationship between bladder cancer and smoking by inhaling or smoking by not inhaling ($p < 0.001$). There was a similar association with bladder cancer and both smoking by inhaling *and* by not inhaling ($p = 0.228$).

For the last four decades, it has been reported in many epidemiological studies [10, 18, 19] and reviews [9, 16, 17] that smoking increases the risk of bladder cancer. Zeegers and colleagues [9] reported in their study that there was a relation between the period and the amount of smoking. It was reported in a meta-analysis including 43 case–control cohort studies that smoking increased the risk of bladder cancer 3-fold, and this increase was correlated with the number of cigarettes smoked and the number of years that smoking continued [9]. In a pooled analysis including 11 case–control studies, the risk of bladder cancer increased with increased duration and amount of smoking. Moreover, the risk increased particularly if the number of cigarettes smoked exceeded 15–20 cigarettes per day [20]. It was reported in the same study that this risk decreased after quitting smoking for 1–4 years; however, it never fell to the level of non-smokers, even 25 years after quitting. However, we observed that there was a significant relationship between bladder cancer and patients who quit smoking for a period of longer than 3 years in our study. Samanic et al. [21] reported that the risk was 1.5-fold greater in those smoking by inhaling the smoke compared with those not inhaling it. However, in our study there was a similar association between bladder cancer and those two groups.

In conclusion, in developing countries like Turkey smoking and alcohol consumption are closely connected with bladder cancer. Our data showed that not inhaling the smoke was also associated with bladder cancer as much as inhaling the smoke. The association between smoking and bladder cancer lasts after quitting smoking. Therefore, education has an important role to play in the prevention of these habits.

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