

Female Lung Cancer and Smoking Habits

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For studying lung cancer risk factor, we carried out a case-control study on female lung cancer in Liaonin Province. The study shows the smoking OR value was 2.42 (1.41–4.11, $P < 0.01$). There was marked correlations between female lung cancer and age of starting smoking, smoking amount, years of smoking, depth of inhalation and types of smoke ($P < 0.01$).

Female lung cancer, Case-control study, Smoking

INTRODUCTION

Chinese women in Shanghai, Hong-Kong and Singapore have been marked as highest incidence group of lung cancer in the cancer registries of the Five continents. Chinese Americans in the US showed the higher incidence rate of lung cancer than the other ethnic groups such as the Caucasians, Japanese and Filipinos. Incidence of female lung cancer in China also shows an increasing trend to take place of gastric cancer, climbing up to the top of the malignant tumors lately.

We tried to confirm effect of cigarette smoking on lung cancer in Shenyang area, by case-control study, because they say Chinese women have lower rate of cigarette smoking and high level of lung cancer before.

MATERIALS AND METHODS

A total of 100 cases of female during 1989–1990 diagnosed as lung cancer in the larger hospitals in Shenyang during 1989–1990. Two controls were selected matching age (2 years) and residential area. The first control was the patients of breast cancer and the second was healthy individuals in the area. Smoking history was examined by one epidemiologist who

interviewed with all cases directly. The questionnaire included not only smoking but also name, sex, age, family status, residence, occupation, genetic history, socio-medical characteristics.

The data were analysed using with the SAS program and this report is to confine only on smoking.

RESULTS

Table 1 shows distribution of the cases and controls by age, nationality, marital status and education. There were no statistically significant difference between two groups.

Smoking rate was 42% in the cases and 23% in the controls, which showed a significant difference (Odds ratio of 2.42 [1.42, 4.11]).

Table 1. Distribution of Age, Nationality Marital Status, Education in Case and Control

Item	Case N (%)	Control N (%)	
Age NS			
0 –	10 (10%)	23 (11.5%)	
40 –	64 (64%)	125 (62.5%)	
60 –	26 (26%)	52 (26%)	
	57.26 (± 8.72)	56.96 (± 8.95)	
Nationality			NS
Chinese Hun	94 (94%)	171 (85.5%)	
Chinese Man	3 (3%)	9 (4.5%)	
Others	3 (3%)	20 (10%)	
Marital status			NS
Married	93 (93%)	176 (88%)	
Others	7 (7%)	24 (12%)	
Education			NS
Illiteracy	35 (35%)	49 (24.5%)	
Primary school	24 (24%)	64 (32%)	
Middle school	36 (36%)	70 (35%)	
College	5 (5%)	17 (8.5%)	

Table 2 shows odds ratios by age at first cigarette smoking, numbers of cigarette per day, duration of smoking, inhalation status and type of tobacco between the smokers of the cases and the controls. All categories showed significant differences between two groups. The smokers starting smoking younger than 15 years showed a relative risk of 5.84, but those started more than 30 were lower risk.

Those smoked more cigarettes per day, and/or longer period, showed higher odds ratio than the less smokers. Odds ratio of other type of tobacco smoking than cigarette was very high of 7.08.

Among 100 cases of lung cancer, 58 patients were never smokers. We examined cell type of lung cancer by smoking habit (never and ever smoking). Distribution of cell type of lung cancer cases was as follows; In never smokers, squamous cell type was 17.2%, adenocarcinoma

34.5%, small cell type 29.3%, and others/unclassified 19.0% and in ever smokers, 38.1, 23.8, 16.7, and 21.4% respectively. Higher proportion of squamous cell carcinoma was in the smokers, and the never smokers had relatively higher proportion of small cell carcinoma of 29.3%.

Table 2. OR Value for Smoking Variables

	case	control	OR	P
Smoker/nonsmokers	42/58	46/154	1.00	
Age at first cigarette smoked (years)				< 0.01
< 15	11	5	5.84	
15 –	26	16	4.31	
≥ 30	5	25	0.53	
No. of cigarettes smoked per day				< 0.01
< 10	8	15	1.42	
10 –	12	16	1.99	
≥ 20	22	15	3.89	
Duration of smoking (years)				< 0.01
1–20	3	15	0.53	
21–40	20	22	2.41	
≥ 40	19	9	5.60	
Inhalation				< 0.01
no	17	29	1.56	
yes	25	17	3.90	
Type of tobacco				< 0.01
cigarette	26	40	1.73	
tobacco, others	16	6	7.08	

Table 3. Cell Type by Smoking Habit

	Squamous cell carcinoma N (%)	adenocar- cinoma N (%)	small cell carcinoma N (%)	others and unclassified N (%)	Total
Never smoker	10 (17.2)	20 (34.5)	17 (29.3)	11 (19.0)	58 (58)
Ever smoker	16 (38.1)	10 (23.8)	7 (16.7)	(21.4)	42 (42)
Total	26	30	24	20	100

Types of smoking habits of the cases with smoking were compared with those of the controls. squamous cell types alone showed significantly younger age at starting smoking, much cigarette smoked per day, longer duration and deep inhalation.

We tried to examine a correlation of passive smoking with cell type of lung cancer. The rate of passive smoking history was 56.9% (33/58) in the lung cancer without smoking and 24.0% (48/200) in the controls. It was a significantly high in the patients. The cases of lung cancer were classified by cell type of lung cancer, and two matched controls were selected for each type of lung cancer. The passive smoking rates were high in the lung cancer group except other and unclassified, but the differences were not statistically significant between any groups (Table 4).

Table 4. Type of Lung Cancer and Passive Smoking Rate

Cell type	Passive smoking history		
	Lung cancer	Controls	P
Squamous cell type	6/10 (60.0%)	5/20 (25.0%)	NS
Adenocarcinoma type	11/20 (55.0%)	15/40 (37.5%)	NS
Small cell type	13/17 (76.5%)	17/34 (50.0%)	NS
Others and unclassified	3/10 (30.0%)	11/20 (55.5%)	NS

DISCUSSION

The above results in the study of female lung cancer and smoking status were quite similar to the reports in China and abroad^(2,3,4). Smoking increase the risk of female lung cancer in Shenyang districts up to 2.5 times but the increase is still lower than that for males. Lung cancer risk obviously increases for those who start smoking before the age of 30, those who have smoked over 40 years, those took deeper inhalations, or who daily smoke over 20 cigarettes. A certain dose-response relationships were observed. A tobacco smokers other than cigarette was seven times higher in risk of lung cancer than that of the controls, which perhaps may be due to more tar and nicotine content in the not-manufactured tobacco in China.

The major histologic types of lung cancer in our study, i.e., squamous cells carcinoma, adenocarcinoma and small cells carcinoma were 26.0%, 30.0% and 24.0% respectively. The results are quite different from that reported by Lam and Kung et al.^(3,5). Adenocarcinoma in our study was relatively less frequent but small cells carcinoma was more. Only the squamous cell carcinoma had a significant correlation with smoking, but adenocarcinoma and small cell carcinoma did not. It is probably due to the weak link between adenocarcinoma and smoking.

The female smoking rate in the general population of Liaoning was 5.63%, but the rate of smokers in the lung cancer was high (42%). The smoking rate of the controls in this series may be higher than that of general population. Although a number of studies indicated that females affected by passive smoking had a higher risk of lung cancer^(3,7,8), our study by type of lung cancer did not show this correlation. This is probably due to the relatively small sample size in this series. However, tobacco smoking seems to be still a major risk factor for female lung cancer in China. Relatively high proportion of small cell carcinoma may be partly due to heavy air-pollution in Shenyang area.

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