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Epidemiological investigation analysis of relevant risk factors in oral cancer.

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Abstract

Objective: To investigate epidemiology of relevant risk factors in oral cancer, which provides basis for oral cancer prevention.

Methods: Epidemiological questionnaire was carried out by multiple-center large-scale sample using case-control method in 8 cities in China. Investigation content included individual basic conditions, general diseases and oral diseases history, oral health habits, smoking and passive smoking, drinking water and common drink conditions, exercises and labor conditions, family history etc. This study used SAS8.2 software to do t test and χ^2 test for data, logistic regression to analyse the relations between various factors and oral cancer.

Results: There were significant differences in doing exercises often, drinking milk, hypertension, oral leukoplakia, bad prosthesis, smoking history, smoking-quit history, smoking with filter cigarette holder etc. between case group and the control group (P<0.05). The longer the smoking time (OR: 3.57, 95% CI: 1.58-8.06), the heavier the smoking (OR: 4.78, 95% CI: 2.07-11.11), the higher the risk degree. Exercises (OR: 0.48, 95% CI: 0.24-0.95), drinking milk (OR: 0.48, 95% CI: 0.23-1.02) and drink water management (OR: 0.53, 95% CI: 0.26-1.10) can lower risk of oral cancer.

Conclusion: Smoking is an important factor of oral cancer. Smoking filter cigarette holder cannot lower incidence of oral cancer; exercises, drinking milk, drink water management can lower incidence of oral cancer.

Keywords: Oral cancer, Risk factors, Epidemiology.

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Introduction

Oral cancer is a common malignant neoplasia of head and neck cancer which may occur in any part of the oral cavity or oropharynx, ranking the sixth most common cancer in the world. It most normally involves the tongue, buccal mucosa, lips, gingival, and oropharynx [1,2]. The estimated oral cancer deaths of China in 2011 were 16,933. The mortality rate was about 1.26/100,000, accounting for 0.80% of all cancer deaths [3]. The International Agency for Research on Cancer (IARC) showed that there were 300,373 new cases and 145,353 deaths of oral cancer in 2012. The estimated 5 y prevalence of oral cancer is 702,149 in the global [4]. Smoking, oral tobacco use and alcohol consumption [5-7] are all major risk factors. The risk for the occurrence of oral cancer is three times higher in smokers compared with nonsmokers [8]. The presence of Human Papillomavirus (HPV) is also a cause for oropharyngeal cancers [9]. Oral cancer treatment often brings function disorder of important organs, including inarticulate speech, dysphagia, and eating disorder etc., changes of facial appearance, which will influence life quality of patients. Therefore, oral cancer prevention is very important. Risk factors of oral cancer are multiple and various. A number of studies showed that smoking and drinking consumption are associated with oral cancer. However, studies on the relationship between beverages, exercises, systemic diseases and oral cancer are limited. In order to identify relevant risk factors for oral cancer, the epidemiological investigation was carried out by using case-control methods in this study.

Materials and Methods

The 8 combination units in this study were affiliated Beijing dental medicine school of capital medical university, affiliated the ninth people's hospital of medical school in Shanghai Jiaotong university, affiliated dental medicine hospital of Guangxi medical university, stomatological hospital of Jiangsu province, Shandong provincial hospital, stomatological hospital of Wuhan university, stomatological department in Xiangya hospital of Zhongnan university, affiliated stomatological hospital of Zhongshan university.

The design of investigation table consulted study investigation table of two alignments [10], experts of relevant oral and maxillofacial surgery. Investigation took oral cancer patients as study objects, the same sex, people who less than 2 y old as the control. They were given comparison in seven parts as followed: individual conditions, including height, weight, education, marital status etc.; general diseases and oral disease history; oral health habits; smoking and passive smoking; drink

water and common drink conditions, including wine drinking history; exercises and working conditions; family history.

This study formulated special item operation regulation, training handbook of investigator, coding handbook of investigation table, ruled each items in investigation table. Responsible personnel and investigation personnel in each unit were given unified meeting training. If there were problems during investigation, please make a phone call and email to communicate, coordinate and unify interactively.

All collected data were given independent coding two times, device two times. Each variable was given range and logical correction for guaranteeing quality. Raw data used Access data base system to input. Data management and analysis were given SAS8.2 software bag. Continuous variable rank division was identified by specialized knowledge or tierce and quartile of the control. Balance test of case and control were given t-test and χ^2 test. This study used Odds Ratio (OR) of logistic regression analysis and 95% Confidence Interval (CI) to evaluate relations between various factors and oral cancer, non-conditions logistic regression model to calculate OR and 95% CI. All statistical analyses were given bilateral test. $P<0.05$, there were statistical differences.

Results

Individual conditions

This study collected 458 cases as effective study objects in total; of which, there were 142 males (66.4%) and 72 cases (33.6%). The average age in case group was 53.7 ± 10.2 y old. The average age in the control group was 55.3 ± 11.1 y old, there were no statistical differences of age in two groups (P=0.177).

Compared differences between Body Mass Index (BMI) and Waist Hip Rate (WHR) in two groups for analyzing whether oral cancer had relations with obesity. BMI: Male case group was 22.83 ± 3.28, the control group was 23.54 ± 2.47, there were no statistical differences between those two; female case group was 22.31 ± 2.88, the control group was 23.58 ± 4.11, there were no statistical differences. WHR: Male case group was 0.92 ± 0.12, the control group was 0.87 ± 0.07, there were statistical differences between those two (P=0.001); female case group was 0.90 ± 0.11, the control group was 0.84 ± 0.07, there were statistical differences between the two (P=0.002). Single factor analysis of WHR showed that for WHR less than 0.85, when WHR equal to or more than 0.9, OR value was 3.13 (1.79, 5.26, P0.000) (Table 1).

Compared economic conditions in two groups; taking family annual income (Yuan/y) as statistical analysis. χ^2 test showed there were statistical differences in two groups (P=0.012). Multiple factors analysis showed that compared with family annual income less than 10 thousands Yuan, family annual income more than 10 thousands Yuan is a kind of protection factor; family annual income more than 30 thousands Yuan compared with family annual income from 10 to 30 thousands Yuan, there were no statistical differences between two groups.

Compared education, marital conditions and occupational conditions between two groups, χ^2 test showed that there were no statistical differences (P>0.05) (Table 2).

General diseases and oral diseases history

General disease history: Common diseases of various system in body were given questionnaire, including chronic obstructive pulmonary disease, TB in respiratory system; hypertension and coronary heart diseases in cardiovascular system; chronic gastritis, peptic ulcer, chronic hepatitis, cholelithiasis in alimentary system; urinary infection, diabetes, hyperlipidemia, apoplexy etc. Statistical analysis (χ^2 test) showed that hypertension history in case group (20.2%) higher than the control group (10.5%) significantly, there were statistical differences (P=0.007). Multiple factors analysis showed that hypertension was risk factors of oral cancer, it's OR value was 2.69 (95% CI was 1.13, 6.40, P=0.026). There were no significant differences of other diseases history in two groups (P>0.05, Table 3).

Oral disease history

Oral disease history in case group and the control group were given investigation respectively, including common oral mucosa infectious diseases (herpes simplex and monilial infection), patches stria disease (leukoplakia, erythema and lichen planus), ROU, chronic dental caries, gingivitis, paradentitis, OSF, residual root, residual crown, bad prosthesis. Balance (χ^2 test) of lesion incidence rate in two groups showed that leukoplakia history of oral cavity (3.8%, 0; P=0.007) and bad prosthesis (14.2%, 7.2%; P=0.027) in case group higher than the control group, there were statistical differences. Multiple factors of bad prosthesis showed that there were no statistical differences (P>0.05).

There were no significant differences in other oral disease history in two groups (Table 4).

Oral health habits

Case group and the control group were given investigation respectively that whether brushed one's teeth every day, rinsed the mouth after a meal, routine oral examination. Statistical analysis showed that the number of routine oral examination in two groups was little, they were 5 cases (2.3%) and the control group (2.8%). Number of rinsing the mouth after a meal in case group (67.3%) higher than the control group (44.4%), there were statistical differences (P<0.05). Multiple factors analysis showed that rinsing the mouth after a meal is risk factors of oral cancer. OR value was 3.31 (95% CI was 1.94, 5.66, P=0.000) (Table 5).

Smoking and passive smoking

Smoking conditions in case group and the control group were given investigation, including smoking history, whether had smoking-quit, filter cigarette holder, passive smoking etc, in working or family environment.

Statistical analysis

(χ^2 test) showed that smoking people percentage in case group, including still smoking people, smoking quit during investigation, but smoking history before (53.5%) higher than the control group significantly, there were statistical differences (P=0.026). At the same time, the percentage of smoking quit people with smoking history in case group (30.7%) higher than the control group (15.6%) significantly, there were statistical differences (P=0.012). There were no statistical differences of smoking people percentage during investigation in two groups. In addition, in case group, people who smoking filter cigarette holder (37.3%) less than the control group (62.2%), there were statistical differences (P=0.001), there were no statistical differences of passive smoking in two groups (P>0.05) (Table 6).

For multiple logistic analysis of smoking conditions showed that smoking was risk factors of oral cancer (OR=2.92, 95% CI: 1.41-6.03). For non-smoking people, the age of smoking equal to or less than 20 y old, the OR value was 3.57(P=0.002). Smoking volume equal to or more than 20, the OR value was 4.78 (P<0.05); people who smoking filter cigarette holder, the OR value was 2.99 (P=0.003) (Table 7).

Drink water and common drink

The case group and the control group were given investigation for drink water management. Drink water management included filter in tap, family water purifiers, bottle water. Statistical analysis (χ^2 test) showed, drink water management in case group (12.6%) less than the control group (25.2%), there were statistical differences (P=0.002). There were no statistical differences in different water management (Table 8).

Common drink included wine, tea, beverages, juice and milk. People who drink milk in case group (11.3%) less than the control group (28.4%) significantly, P<0.05. Multiple factors analysis showed that drinking milk is the protection of avoiding oral cancer. Its OR value was 0.48. P=0.046. There were no significant differences of other conditions in two groups (Table 9).

Exercises and labour

The case group and the control group were given investigation about whether attended exercises, included indoor sports (gym) and outdoor sports (mainly referred to ball sports), walking every day or bicycle time, housework time every day.

Statistical analysis showed that people who often attended exercises in case group (13.6%) less than the control group (26.6%) significantly, there were statistical differences (χ^2 test, P=0.001). Multiple factors analysis showed that often exercises were the protection factor of oral cancer. Its OR was 0.48. P=0.034. Further analysis showed that bicycle time in the control group (24.1 ± 54.6) min/d) higher than the case group (6.5 ± 15.3) min/d) significantly, there were statistical differences (t-test, P=0.009). There were no statistical differences in housework time and other exercises time between two groups (Table 10).

Family history

This study inquiry conditions of tumor in direct relative of three generations of study objects in detail. χ^2 showed that there were no statistical differences of tumor family history in case group (16.0%) and the control group (11.7%) (P=0.262). Logistic multiple factors analysis also showed that family history for oral cancer, there were no statistical differences (P=0.616).

Table 1. *Comparison of body mass index and waist-hip ratio between the groups.*

	Male			Female		
	Case group	The control group	P value	Case group	The control group	P value
BMI	22.83 ± 3.28	23.54 ± 2.47	0.070	22.31 ± 2.88	23.58 ± 4.11	0.051
WHR	0.92 ± 0.12	0.87 ± 0.07	0.001	0.90 ± 0.11	0.84 ± 0.07	0.002

Table 2. *Comparison of the economic, educational and marital conditions between the groups.*

	Case group	The control group	P value (χ^2 test)	OR value (95% CI)	P value
Family annual income (Yuan/y)					
<10000	58 (29.6%)	32 (16.4%)	0.012		
<20000	63 (32.1%)	78 (40.0%)		0.45 (0.26, 0.77)	0.004
<30000	36 (18.4%)	48 (24.6%)		0.41 (0.22, 0.76)	0.005
≥ 30000	39 (19.9%)	37 (19.0%)		0.58 (0.31, 1.09)	0.088
Education					
Primary school or below	71 (33.1%)	51 (24.2%)	0.093		
Junior high school	70 (32.7%)	76 (36.0%)		0.66 (0.41, 1.08)	0.095

Senior high school	49 (22.9%)	47 (22.2%)		0.75 (0.44, 1.28)	0.292
Junior college or over	24 (11.3%)	37 (17.5%)		0.46 (0.24, 0.86)	0.076
Marital conditions					
married	201 (93.9%)	199 (95.2%)	0.220		
Others	13 (6.1%)	10 (4.8%)		1.17 (0.51, 2.67)	0.710

Table 3. *Relationship between oral cancer and systemic diseases.*

	Case group	The control group	P value (χ^2 test)	OR (95% CI)	P value
COPD	8 (3.8%)	7 (3.3%)	1.000	1.76 (0.46, 6.77)	0.414
TB	2 (0.9%)	1 (0.5%)	1.000	1.82 (0.09, 36.23)	0.694
Hypertension	43 (20.2%)	22 (10.5%)	0.007	2.69 (1.13, 6.40)	0.026
Coronary heart disease	5 (2.3%)	5 (2.4%)	1.000	-	0.999
Chronic gastritis	16 (7.6%)	25 (11.9%)	0.143	0.61 (0.26, 1.44)	0.255
Peptic ulcer	11 (5.2%)	9 (4.3%)	0.820	0.65 (0.16, 2.65)	0.550
Chronic hepatitis	7 (3.3%)	3 (1.4%)	0.338	4.41 (0.70, 27.74)	0.114
Cholelithiasis	7 (3.3%)	2 (1.0%)	0.175	3.47 (0.58, 20.78)	0.172
Chronic urinary infection	4 (1.9%)	7 (3.3%)	0.379	0.39 (0.09, 1.72)	0.212
Diabetes	11 (5.2%)	4 (1.9%)	0.112	1.22 (0.21, 7.10)	0.824
Hyperlipidemia	8 (3.8%)	7 (3.4%)	1.000	2.08 (0.46, 9.45)	0.344
Apoplexy	5 (2.3%)	3 (1.4%)	0.724	2.40 (0.25, 23.24)	0.450

Table 4. *Relationship between oral diseases and oral cancer.*

	Case group	The control group	P value (χ^2)	OR (95% CI)	P value
Oral herpes simplex	3 (1.4%)	4 (1.9%)	0.722	3.50 (0.25, 48.66)	0.351
ROU	22 (10.4%)	11 (5.3%)	0.069	1.69 (0.62, 4.58)	0.306
Chronic dental decay	76 (36.5%)	55 (27.4%)	0.056	1.15 (0.63, 2.09)	0.649
Gingivitis	29 (14.1%)	24 (11.9%)	0.557	1.10 (0.46, 2.62)	0.837
Periodontitis	35 (17.0%)	34 (16.5%)	1.000	1.14 (0.56, 2.31)	0.725
Residual root and crown	37 (17.5%)	27 (13.0%)	0.223	1.14 (0.53, 2.45)	0.730
Bad prothesis	30 (14.2%)	15 (7.2%)	0.027	0.76 (0.26, 2.27)	0.628

Table 5. *Comparison of the oral hygiene habits between the groups.*

	Case group	The control group	P value (χ^2 test)	OR (95% CI)	P value
Brush tooth every day	192 (89.7%)	201 (93.9%)	0.174	1.00 (0.29, 3.50)	0.999
rinsing the mouth after a meal	144 (67.3%)	95 (44.4%)	0.000	3.31 (1.94, 5.66)	0.000
Routine oral examination	5 (2.3%)	6 (2.8%)	0.772	0.50 (0.07, 3.43)	0.481

Table 6. *Comparison of the smoking between the groups.*

	Case group	The control group	P value (χ^2 test)
Smoking history	114 (53.5%)	90 (42.5%)	0.026
Still smoking	79 (37.1%)	76 (35.8%)	1.000
Smoking quit	35 (30.7%)	14 (15.6%)	0.012

Smoking filter cigarette holder	41 (37.3%)	51 (62.2%)	0.001
Passive smoking (in family)	40 (33.3%)	40 (28.8%)	0.500
Passive smoking (in working)	18 (19.6%)	19 (15.2%)	0.466

Table 7. Logistic multifactor analysis for smoking and oral cancer.

		Case group	The control group	OR (95% CI)	P value
Smoking history		114 (53.5%)	90 (42.5%)	2.92 (1.41, 6.03)	0.004
The age of smoking	>20 y old	48 (23.1%)	39 (18.9%)	2.23 (0.96, 5.15)	0.061
	≤ 20 y old	61 (29.3%)	45 (21.8%)	3.57 (1.58, 8.06)	0.002
Years of smoking	Equal to or less than	56 (27.1%)	46 (23.0%)	2.86 (1.30, 6.29)	0.009
	More than 30 y	52 (25.1%)	32 (16.0%)	3.52 (1.41, 8.77)	0.007
Number of smoking everyday	Less than 20	32 (15.3%)	49 (23.9%)	1.58 (0.39, 3.65)	0.281
	Equal to or more than 20	78 (37.3%)	34 (16.6%)	4.78 (2.07, 11.11)	0.000
Had filter cigarette holder	Smoking with filter cigarette holder	105 (49.3%)	81 (38.2%)	2.99 (1.43, 6.21)	0.003
	no smoking with filter cigarette holder	9 (4.2%)	9 (4.2%)	1.81 (0.29, 11.36)	0.528
No filter cigarette holder	Smoking without filter cigarette	41 (19.6%)	51 (25.0%)	2.24 (0.98, 5.10)	0.055
	Not smoking cigarette without filter holder	69 (33.0%)	31 (15.2%)	3.97 (1.73, 52.63)	0.001
Passive smoking in family		40 (33.3%)	40 (28.8%)	0.80 (0.38, 1.68)	0.552
PASSIVE smoking in working		18 (19.6%)	19 (15.2%)	1.00 (0.30, 3.33)	0.998

Table 8. Comparison of the drinking water between the groups.

	Cases group	The control group	P value (χ^2)
Drink water without management	174 (87.4)	157 (74.8%)	0.002
Drink water with management	25 (12.6%)	53 (25.2%)	0.088

Table 9. Comparison of common beverage between the groups.

	Case group	The control group	P value (χ^2 test)	OR (95% CI)	P value
Drinking wine	91 (42.7%)	70 (33.3%)	0.057	1.75 (0.87, 3.52)	0.118
Drinking tea	79 (36.9%)	60 (28.7%)	0.079	1.00 (0.54, 1.85)	0.986
Coffee	3 (1.4%)	4 (1.9%)	0.725	1.64 (0.24, 11.32)	0.614
Carbonated beverage	11 (5.2%)	11 (5.2%)	1	0.99 (0.29, 3.39)	0.985
milk	24 (11.3%)	60 (28.4%)	0	0.48 (0.23, 1.02)	0.046
Juice processing	13 (6.1%)	14 (6.6%)	1	2.36 (0.78, 7.11)	0.127

Table 10. Comparison of sports and labor between the groups. Note: [a]was χ^2 test, [b]was t-test.

	Case group	The control group	P value (χ^2 test)
Often attending exercises	29 (13.6%)	57 (26.6%)	0.001[a]
Exercises every day (min)			
Walking	75.1 ± 87.3	96.7 ± 231.2	0.391[b]
Bicycle	6.5 ± 15.3	24.1 ± 54.6	0.009[b]
Motorcycle and autocar	21.5 ± 93.3	10.3 ± 31.0	0.380[b]
Riding	10.5 ± 31.1	6.1 ± 9.3	0.305[b]
Housework	67 (31.5%)	63 (29.4%)	0.680[a]

Discussion

Oral cancer is the common malignant tumor in the neck and head. In recent years, treatment effects of some tumor improve

greatly, but the survival rate of oral cancer for five years still in 50% [11]. Treatment of oral cancer often brings loss of language and swallow function, changes of maxillofacial features as important appearance features which will influence social communication of patients. Therefore, prevention and early diagnosis of oral cancer are very important. This study selects 8 regions nationwide, takes prevention of oral cancer as goal, and gives case-control study for relevant factors of oral cancer.

Relations between oral cancer and general conditions

Incidence of tumor is the results of multiple factors, including local pessimal stimulation, general conditions, individual life environment, living habits etc. [12]. There are lots of studies devote to explore correlations between oral cancer and diet habits and health habits. But the documents about the relations between oral cancer and general systemic diseases are few.

Hypertension is a common disease in modern people, its incidence has relations with diet habits, exercises, obesity and psychological stress etc. Hypertension can cause pathophysiological changes of general multiple system.

This study finds that in oral cancer patients, people who have hypertension history higher than the control group significantly; at the same time, WHR which can reflect obesity degree of body, it in oral cancer patients higher than the control group significantly. It shows that oral cancer incidence has relations with risk factors of obesity and hypertension. This study investigates exercises conditions of people in two groups. The results showed that aerobic exercises of active in exercises, walking in daily life, bicycle in oral cancer patients less than the control group obviously. Exercises has protection effects on cardiovascular system, can inhibit obesity; it is still need to be demonstrated that exercise whether is the protection factor of oral cancer.

There are investigation reports think that incidence of oral cancer has relations with social status, economic conditions, most in social low class and low income people [13].

This study investigates the individual living environment, it is found that economic income has significant influences in a certain degree: compared with family which annual income less than 10 thousands Yuan, annual income more than 10 thousands is a protection factor. But comparing family annual income more than 30 thousands with annual income from 10 thousands to 30 thousands, there are no statistical differences. Comparing jobs, marriage and education etc. in the same region in our country on case-control comparison, there are no statistical differences.

It is said that economic conditions can influence oral cancer in a certain degree, on the other hand, there are difference in social environment of oral cancer between China and Western countries.

The relations between oral cancer and oral environment

Oral cancer has close relations with precancerous lesion of oral mucous, of which, Oral Submucous Fibrosis (OSF), Oral Lichen Planus (OLP) and Oral Leukoplakia (OLK) have been given high attention.

This investigation shows that there are significant differences in leukoplakia of oral mucous between case group and the control group, which is consistent with study results before. Therefore, active prevention for leukoplakia of oral mucous is still one of important oral cancer prevention methods. There are no significant differences in lichen planus and submucosal fibrosis between two groups.

As for reasons, people who have oral lichen planus visit oral medicine department mostly, oral cancer visit oral and maxillofacial surgery. Therefore, the diagnostic rate of oral mucous diseases is relatively low; submucosal fibrosis incidence relate to multiple regions. In our country, it is common in Hunan regions where people often chew areca. But his investigation involves many provinces in China. There are statistical differences in total sample by statistics.

This study also investigates incidence conditions of dental decay, periodontal disease, and oral virus infection. These oral diseases have causal relationship with oral environment, including cleanliness, PH value, aerobic conditions etc. [14]. It is still unclear that reason of oral cancer.

Although there are no statistical differences in this investigation in two groups. For absolute value, incidence rate of oral lesion in case group higher than the control group.

In addition, this study finds that the percentage of rising after a meal higher than the control group obviously (OR=3.31), and there are no similar reports through checking documents.

Because we cannot differentiate rinse the mouth by branch water and mouthwash in rising after a meal in this investigation, so it is still need to be distinguished, which will give us proper explanation. Although most scholars think that bad denture repair is one of reasons of oral cancer, but there are opposite opinions. The influences of denture repair on oral mucous include mechanical physical stimulation and chemical stimulation of materials.

Studies show that the influences of mechanical traumatic stimulation on oral cancer is subtle, because the cancerous rate in tongue tip and hard palate etc. which are vulnerable to trauma far lower than other parts [15].

But for chemical stimulation of materials, most materials of denture repair is common, and applied in clinic for many years. It has been verified it is safe and reliable. This study shows that though χ^2 test shows there are statistical differences in bad denture repair incidence rate in two groups. But multiple factors show there are no statistical differences. Therefore, it is still need to study relations between bad denture repair and oral cancer.

Relations between oral cancer and tobacco, drink

Correlation between oral cancer and hobby of tobacco and wine has been reported. Whatever investigation department at home and abroad, all think that oral cancer has close relations with tobacco intake and over drinking [16,17]. This study also show that smoking percentage in case group higher than the control group; the start smoking age less than 20 y old or smoking volume over 20 are risk factors of oral cancer.

Further analysis finds that filter cigarette holder in case group higher than the control group. There are studies which show that carcinogenicity of smokeless tobacco higher than smoke tobacco. It means filter cigarette holder cannot lower risk of tumor by tobacco [18,19]. This study results haven't been recognized in China. Most people think that filter holder can lower risk of tobacco.

In this study smoking people in case group higher than the control group. They think that through filter holder can lower risk of tobacco, at the same time, it will increase smoking volume, causing oral cancer finally.

This study finds that smoking quit percentage in case group higher than the control group. Further analysis finds that the smoking quit often happens in case group after diagnosed as oral cancer. It shows case group often adopts smoking quit behavior after disease diagnosis.

From that, risk of tobacco is known to all people, but different people will adopt different behaviors. Some use filter holder (case group), some will reduce volume of smoking (the control group), others adopt smoking quit methods after diagnosis. Therefore, on one hand, we should strengthen knowledge propaganda comprehensively, on the other hand, popularize more effective smoking quit methods.

This investigation shows that management of drink milk and drink water in the control group higher than case group. Multiple factor analysis shows that drinking milk is the protection factor of oral cancer. Diet structure is regarded as the second tumor controllable factors after tobacco [20,21]. There are studies come up with that eating antioxidant of vegetables and fruits to lower incidence risk of oral cancer [22], the effects of drinking milk and drink water are still unclear. Milk contains various proteins and bioactive factors. Drink water contains microorganism and mineral ions of different degrees, its effects on oral mucous still need to be studied. In conclusion, incidence of oral cancer is the results of various risk factors. World Health Organization (WHO) thinks that tobacco is one of important factor for avoiding oral cancer. This study shows that filter holder cannot lower the stimulation of tobacco on oral cancer; exercises, drinking milk, drink water management have protection for oral mucous, its mechanism still need to be studied furtherly.

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