Original Article

Risk factors for laryngeal and pharyngeal cancer in patients treated at Liaquat University Hospital, Jamshoro, Pakistan

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Objective: To assess the environmental as well as dietary risk factors for the laryngeal and pharyngeal cancer (LPC) in patients treated at Liaquat University Hospital, Jamshoro.

Methodology: Total 395 LPC patients and 550 healthy persons were interviewed through a standard questionnaire specially designed to study the risk factors for LPC disease. Significance level ($p<0.05$) was assessed with chi-squared test (95% confidence interval) and odds ratios were measured for associations of factors with LPC by logistic regression analysis.

Results: The age range was 37.6 to 56.6 years with majority of males as compared to females. Majority of LPC patients were married, underweight and labor workers. Use of non-branded oil, smoking and illiteracy and sun exposure ?1 hour were significantly positively associated with LPC. Mainpuri was observed at highest significant positive risk factor for LPC. Less vegetables, less fruit and less meat consumption as well as, deep fried/fried foods and more tea intake were found significantly positively associated with LPC disease.

Conclusion: Labor work, Illiteracy, smoking, use of non-branded cooking oil, sun exposure ?1 hour, manipuri, consumption of less vegetables, less fruit and less meat, deep fried/fried foods and more tea intake were found significantly positively associated risk factors of LPC. (Rawal Med J 201;43:72-76).

Keywords: Laryngeal cancer, pharyngeal cancer Mainpuri.

INTRODUCTION

Squamous cell cancers are mostly upper aero-digestive tract cancers; emerge in mucous membranes of larynx, pharynx and mouth. Annually, about 540000 fresh cases and 271000 deaths occur all over the world.[1] Etiological studies reveal exposure to sunlight, alcohol usage and smoking in Western nations. Whereas in developing countries, the consumption of alcohol, habit of smoking and smokeless tobacco chewing altogether with malnutrition are identified as most frequen risk factors.[2] A mixture of smoking, liquor drinking, paan-tobacco use and poor oral cleanliness have been ascribed to tumors of oral cavity in case-control studies from India.[3-4]

The epidemiological confirmation on dietary variables and the danger of tumor has been explored. During frying foods enriched with proteins like fish and meat, the different carcinogenic heterocyclic-amines are created, especially because of increasing temperature.[5] Among the multifactorial risk of laryngeal and pharyngeal cancer, dietary, environmental and genetic causes are also involved. Most sporadic tumors are the consequence of a multi-step procedure of accumulated genetic modifications. These changes influence behaviour of epithelial cell in such a way that losing chromosomal heterozygosity, which thus prompts a progression of occasions advancing to a definitive phase of obtrusive squamous cell carcinoma.[6] As the environmental conditions and dietary habits are varied among countries hence, present study aimed to explores dietary as well as environmental risk factors of larynx and pharynx cancer in the patients treated at Liaquat University Hospital, Jamshoro.

METHODOLOGY

A total of 395 laryngeal and pharyngeal cancer (LPC) patients from Liaquat University, Hospital,

Jamshoro and 550 age and gender matched healthy persons having negative personal and family history of cancer were selected as controls. The study was carried out from November 2014 to August 2015. All the study subjects were interviewed with the help of a standard questionnaire specially designed to study the risk factors for LPC. Study was approved by Institutional Ethical committee at Institute of Biochemistry, University of Sindh, Jamshoro. All the patients and controls gave their consent by signing the informed written consent form.

Questions were asked about their profession/occupation, education, marital status, life style, obesity in past, time spent in sun (hours/day), any other disease in the past, family history of cancer, any psychological problem in past, blood pressure, exposure to radiation, dietary habits, addictions, heartburn and source of drinking water. Age of patients were recorded from files, their height as well as weight were also measured to compute BMI according to the WHO criteria.[7]

Statistically data was analysed by SPSS version 22. The chi-squared test with 95% confidence interval was used to evaluate the level of significance and the associations of factors were measured by odds ratios for LPC disease by logistic regression analysis. Results were significant if $p<0.05$.

RESULTS

Out of 395 LPC patients, 68.4% were males and 31.6% females with age range of 37.6 to 56.6 years. Majority of LPC patients were married (94.9%), underweight (56.9%), with the age of 45-59 years (48.1%) and labours (60.8%) by profession (Table 1). Illiteracy, smoking, use of non-branded cooking oil, sun exposure ?1 hour and ? 8 hours were found significantly positively associated with LPC. Among the chewing tobacco habits Manipuri was observed as highest risk factor for LPC followed by pan, collective and betel nuts, whereas, ghutka, naswar and naas (Table 2). Consumption of less vegetables, less fruit and less meat, deep fried/fried foods and more tea intake were found with significantly positive association with LPC, whereas, saltish and sweet foods showed a non-significant positive association with LPC (Fig. 1).

Table 1. Sociodemographic characteristics of laryngeal and pharyngeal cancer patients and controls.

Characteristic	LPC Patients n=395 (%)	Controls n=550 (%)
Mean age range (years)	37.64-56.62	28.50-58.38
Gender		
Male	68.35	68.18
Female	31.64	31.80
Marital Status		
Married	94.93	71.81
Unmarried	05.06	28.18
Age wise frequency		
≤15-29	11.39	30.90
30-44	21.51	22.72
45-59	48.10	21.81
>60	18.98	24.54
Profession		
Labour	60.75	46.36
Office Job	05.06	12.72
House Wives	26.58	22.72
Student	03.79	13.63
Business Man	03.79	04.54
Body Mass Index		
Normal weight (18.5-24.9 Kg/m^2)	36.70	60.50
Underweight (<18 Kg/m^2)	56.90	11.60
Overweight (25-29.9 Kg/m^2)	05.00	22.70
Obese (≥ 30 Kg/m^2)	01.40	05.20

p=<0.05, Red dashed line shows Reference group= 3 times/week normal vegetables, meat, fruit, 3 cups of tea/day, Normal cooked Food. Odds ratio=1= no association, OR=>1= positive association, OR=<1=negative association

Fig. 1. Relationship of dietary habits with laryngeal and pharyngeal cancer.

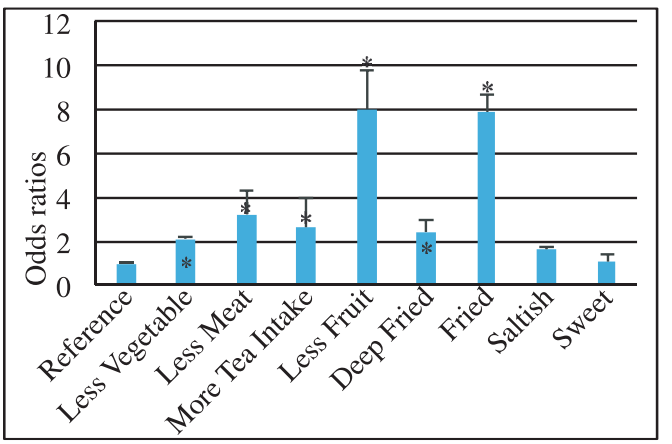

Table 2. Risk factors associated with laryngeal and pharyngeal cancer in patients.

Factor	LPC patients n=395 (%)	Controls n=550 (%)	Odds ratio with 95% confidence interval	p-value
Education				
Educated	44.31	82.72	1.00 (reference)	-
Uneducated	55.69	17.28	6.021 (2.09-12.398)	0.001
Alcohol				
No	96.20	98.18	1.00 (reference)	-
Yes	03.80	01.82	2.132 (0.281-0.403)	0.403
Smoking				
No	56.96	78.18	1.00 (reference)	-
Yes	43.04	21.82	2.707 (1.369-5.375)	0.002
Chewing Products				
Gutka	03.79	01.87	3.654 (0.471-32.76)	0.14
Mainpuri	12.65	00.90	24.359 (3.028-525-948)	0.001
Pan	03.79	00.90	7.308 (0.646-188.322)	0.049
Betel nuts	13.92	04.54	5.359 (1.579-19.138)	0.001
Naswar	02.53	01.81	2.436 (0.235-25.327)	0.368
Naas	02.53	00.90	2.872 (0.332-140.09)	0.16
Collective	11.39	02.72	7.308 (1.684-36.215)	0.001
No chewing products	49.40	86.36	1.00 (reference)	-
Edible Ghee/Oil				
Use of non-branded Ghee	34.17	20.82	1.435 (0.449-4.62)	0.496
Use of non-branded Oil	54.43	15.55	3.092 (0.968)	0.03
Use of others oils	11.40	63.63	1.00 (reference)	-
Exposure to Sun				
≤ 1 hour	01.28	13.63	0.157 (0.007-1.25)	0.049
2-4 hours	31.64	53.63	1.00 (reference)	-
5-7 hours	20.25	28.18	1.218 (0.529-2.797)	0.612
≥ 8 hours	46.83	04.61	17.464 (5.665-57.647)	0.001

DISCUSSION

Populace with less education along with low income have shown increased frequency rate of the disease. The larger number of patients with larynx cancer are jobless or not skilled laborers and agriculturists lacking fundamental tutoring.[8] In our study, we found that males were majorly affected by LPC as compared to females. The reason behind it is well known and reported by Bhurgri et al. that there is contrast between the socioeconomic, social and cultural values in male and females, tobacco smoking and chewable tobacco is more common in males.[2]

In present study, high consumption of mainpuri was found, followed by paan, betel nuts and collective addictions (Table 2). Main components of mainpuri are camphor, chewing tobacco, clove, areca-nut/betel nuts, cinnamon and slacked lime. This complex dry mixture has mutagens that can be easily dissolved in water and play a genotoxic role to effect DNA, whereas polyphenol fractions, arecoline and tannic acid present in slaked lime and betel nut interrupts protein and nucleic acid metabolism, leading to cause cancer.[9]

Unlike present study, which showed more males with LPC, Bhurgri et al reported that females were regularly encountering LPC as they have greater habit of chewing tobacco.[2] We found majority of LPC patients were in older age (45 to 59 years); these results are similar to a study from Karachi Pakistan.[10]

A general quantitative evaluation of the danger of pharyngeal tumor in connection to foods grown from the ground utilization was given.[11] Important

epidemiological studies have shown that numerous consumed substances, including dietary cancer-causing agents and anticancer substances, may influence in the rate of diseases.[12] In a few populaces, cigarette smoking and drinking alcohol along with consumption of tea are associated.[13] Tea utilization is accounted for to be connected with the advancement and movement of a few sort of endless infections.[14] Many studies have been conducted to investigate the association of tea intake with larynx and pharynx carcinomas, but still no evidence for any association have been found.[15] We found the significant positive association of more tea intake with LPC (Fig.1).

All types of tobacco including pipes, cigarettes, cigar and chewable tobacco have been involved in the enhancement of squamous cell cancers. About 90% deaths of males having this type of cancer are due to the use of tobacco.[16] Second independent major risk factor for the expansion of cancer in nonsmokers is consumption of alcohol. Risk is increased linearly by consuming about 30 grams of alcohol.[17] In India, South Asia, South Pacific Islands besides the smoking, the chewable tobacco products like mainpuri, ghutka, and betel quid utilization enhances the risk of squamous cell carcinomas.[18] Present study also revealed the greater utilization of mainpuri as compared to other tobacco forms (Table. 2). Emamhadi and Jalilvand reported 35% to 40% use of chewable tobacco in India, whereas, a former study in Pakistan reported the consumption of betel quid 21% in males and 12% in females.[19] Khawaja et al reported that 40% adults in Karachi, Pakistan consume at least one smokeless tobacco product daily.[20]

Use of non-branded oil and ghee showed significantly positive association with LPC (Table 2). Non-branded oil made by mixing rapeseed and cottonseed oil. In 2003 Channa et al from Hyderabad, reported a significantly positive association of rapseed oil with the formation of gallstones.[21] Foods rich in proteins during frying produce different carcinogens as well as heterocyclic amines, conceivable or likely cancer-causing agents for people.[5]

Some studies showed malignancy danger if fried potatoes and eggs are consumed.[22,23]

CONCLUSION

Majorly LPC patients were males, underweight, married and labour workers with an age of 45-59 years. Illiteracy, smoking, use of non-branded cooking oil, sun exposure ? 1 hour and ? 8 hours, habit of manipuri, consumption of less vegetables, less fruit and less meat, deep fried/fried foods and more tea intake were found with significantly positively associated to LPC, whereas, ghutka, naswar, naas, alcohol, use of non-branded ghee and 5-7 hours sun exposure, saltish and sweet foods revealed non-significant positive association.

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