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Tobacco use and the risk of laryngopulmonary carcinoma and other related diseases: A prospective study

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Abstract

Introduction: Tobacco smoking is recognised as a distinct risk factor for both oropharyngeal and laryngeal malignancies. It is of the utmost importance to educate the general people about the harmful repercussions that tobacco use has on malignancies. The purpose of this study is to investigate the connection between smoking and the development of laryngopharyngeal cancer at Sangareddy Teaching Hospital.

Materials and Methods: All of the 820 patients who participated in this research gave their informed permission before the trial was carried out. The patients were asked to provide their entire health history, as well as their clinical and laboratory data, which were then gathered from discharge summaries or the medical record department. For the purpose of conducting a laboratory examination of nicotine levels, blood samples were taken.

Results: The majority of the patients were between the ages of 21 and 40 (65.24 percent), with males making up the majority (91.7 percent). Cancer was found in the pyriform sinus in 75% of the patients, followed by cancer in the posterior pharyngeal wall in 9% of the cases. Nearly ninety percent of the cases were squamous cell carcinoma. The number of samples in which positive nicotine levels were found was much lower than the total.

Conclusion: A significant contributor to the development of laryngopharyngeal malignancies seems to be the use of tobacco products and tobacco products for an extended period of time and in excessive amounts. Putting an end to tobacco use leads to a significant reduction in the number of pathologic lesions that are present in the laryngopharynx.

Keywords: Tobacco smoking, laryngopharyngeal cancer, squamous cell carcinoma

Introduction

The use of tobacco and the goods that are associated with it pose a significant threat to public health all throughout the world, particularly in the nations of Asia and India. Every year, the use of tobacco products is responsible for the deaths of more than six million people throughout the world. There were more than 17,560 fatalities in India in 2012 that were attributed to laryngeal cancer that was caused by tobacco usage ^[1]. There have been reports that indicate that the incidence of laryngeal cancer in India ranges from 1.26 to 8.18 per 100,000 people ^[2]. The danger of developing cancerous tumours in almost every organ in the body is enhanced by the use of tobacco products. As a result of the direct exposure that occurs during tobacco intake, it is generally acknowledged that the use of tobacco is directly associated with the development of cancers of the larynx and the oropharynx ^[3] 2. According to the findings of a research, smokers account for 96.5% of patients diagnosed with squamous cell carcinoma of the larynx, which gives them a relative risk of 5.6 ^[4].

There is a wide variety of smokeless tobacco products that include nicotine that allows for dissolution. In Asian nations, particularly India, the use of smokeless tobacco products is more prevalent than in other countries ^[2]. Lesions of the laryngeal mucosa are caused by tobacco smoke, which is definitely responsible for the development of other laryngeal disorders as well. Although there have been few studies that have proved the relationship between tobacco smoking and laryngeal cancer, the fact remains that tobacco smoke produces these lesions. Because of this, this research was planned to investigate the relationship between tobacco use and laryngopharynx cancer at a tertiary care hospital.

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The literature that was reviewed above provided support for this investigation.

Materials and Methods

The current prospective research was carried out at the Prathima Institute of Medical Sciences in Karimnagar from December 2013 to November 2014 at the Department of ENT. In this research, 820 individuals between age group 21-70 years, who had been admitted to the department participated. Every participant provided written informed permission, and the research procedure was approved by the institutional ethics committee. Patients provided the patients' complete clinical history, as well as their laboratory and clinical results. Clinical histories of a small number of patients were gathered from medical record departments or discharge summaries. A thorough medical history of tobacco use, including the amount of tobacco smoked and the time since the patient became addicted, was also documented. The

number of tries determined the classification of smokers into four categories: occasional, low, medium, and heavy.

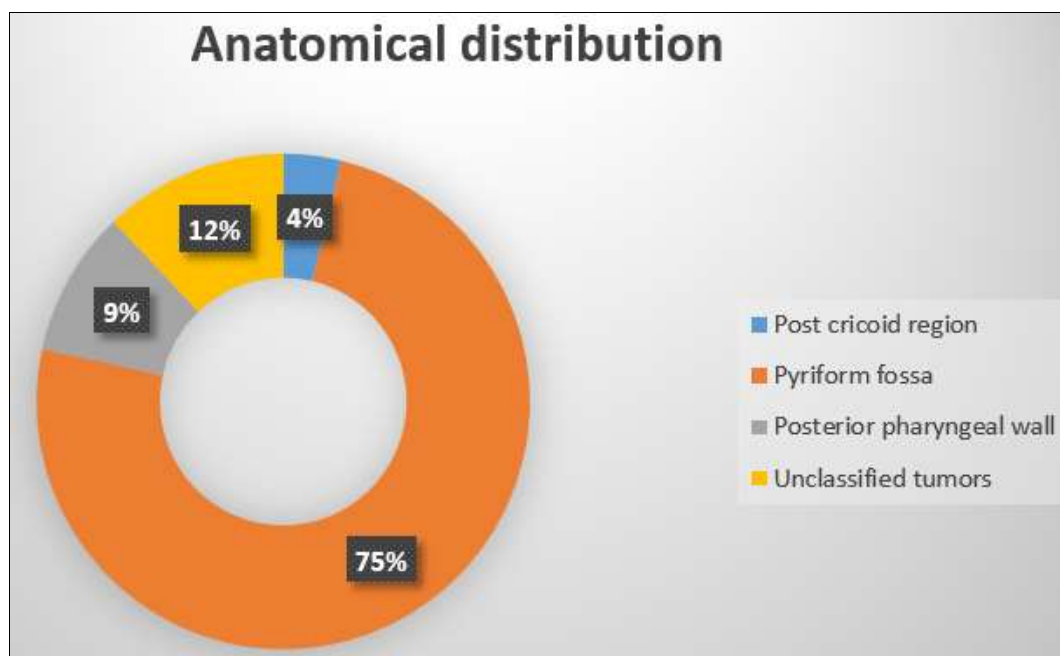
To measure the amount of nicotine in the blood, blood samples were taken. In addition to being cancer patients, a control group of patients who shared the same age and sex and had a comparable tobacco-smoking history had their blood samples obtained and their blood nicotine levels analysed. SPSS was used to evaluate the data that had been gathered. The frequency and percentages of the data were shown.

Results

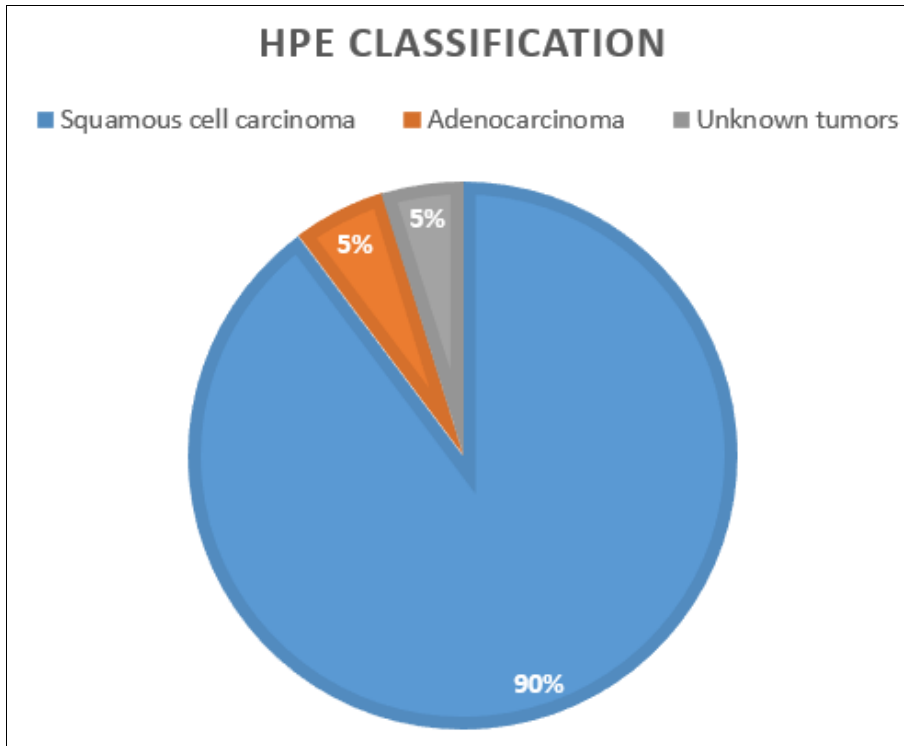
A total one thousand patients were considered and most of the patients were between age group 51-60 years (38.5%) followed by 41-50 years (22%) and 61-70 years (16.2%) and incidence of disease was gradually decreased with advancement of age (Table 1).

Table 1: Showing age distribution of the cases

Demographic data	Total no of cases (n=820)	
	Frequency	Percentage
Age (In Years)		
21-40	535	65.24%
41-60	210	25.60%
>60	75	9.14%
Gender		
Male	752	91.70%
Female	68	8.30%
Type tobacco substance		
Only Smoking	422	51.46%
Tobacco Substance + Smoking	704	85.85%
Normal (without tobacco)	168	20.48%



Graph 1: Anatomical distribution of tumors in study participants



Graph 2: Histopathological Classification of tumors in study participants

Table 2: Blood nicotine level estimated by TLC method

Cases	TLC results	Male	Female
Cancer (n= 74)	+	12	02
	++	08	01
	+++	06	01
	++++	05	-
	-ve	32	07
Control (n= 74)	+Ve	02	-
	-Ve	66	06

Table 3: Blood nicotine level estimated by GC methods

Cases	Blood nicotine level	Male	Female
Cancer (n= 74)	> 1.424 ug/ml	26	10
	< 1.424 ug/ml	05	02
	Not diagnosed	25	06
Control (n= 74)	Not diagnosed	41	12
	< 1.424 ug/ml	15	07

Discussion

Participants ranged in age from 21 to 40 the majority of the time, with males making up the majority. There are 51.46% of participants who solely smoke tobacco, 85.85% of participants who smoke tobacco in addition to other tobacco products, and 20.48% of people who are considered to be normal (Table 1). According to the Indian cancer statistics, laryngeal cancer is more prevalent in men than in females. This is because males account for three to six percent of all cases of the disease, while girls only account for two to fifteen percent [6]. The incidence of laryngopharyngeal cancer has dramatically dropped in the Delhi and Mumbai sectors over the course of the last several decades in India, whereas it has significantly grown in the Bhopal sector at the same time [7]. Four percent of the patients saw a lesion in the postcricoid area, seventy-five percent in the pyriform fossa, nine percent in the posterior pharyngeal wall, and twelve instances had tumours that were not identified (Graph 1). Oral cavity, oropharynx, larynx, and oesophagus were affected by tobacco use in 74.70% of cancer cases, according

to a research conducted by the International Centre for Molecular Research (ICMR). The use of tobacco has been shown to raise the risk of developing laryngeal cancer, according to a number of cohort studies conducted all over the globe [8-10]. It was established by the National carcinoma Registry Programme that laryngeal carcinoma is one of the types of cancer that are associated with tobacco use [11]. The International Agency for Research on Cancer (IARC) monograph [12] verifies and categorises tobacco use as a carcinogenic to human beings, based on epidemiological data. Graph 2 shows that squamous cell carcinoma was found in 90% of the individuals, adenocarcinoma was found in 5% of the subjects, and unknown tumours were found in 5% of the subjects.

As a result of its hemodynamic effects, nicotine may be a contributor to the cardiovascular disease that is associated with smoking [13-15]. Although there is a lack of clarity on the connection between nicotine use and cardiovascular morbidity, there is a widespread belief that nicotine replacement treatment may lead to a reduction in the risk of developing cardiovascular problems and malignancies [16-20]. Despite the fact that nicotine does not cause cancer, it has been shown via both *in vitro* and animal research that it has a role in the growth of tumours by inhibiting apoptosis and promoting angiogenesis [21, 22]. According to the findings of the current investigation, positive nicotine levels were discovered in a smaller number of instances (Table 5) among the 148 participants who were examined for blood nicotine using the thin layer chromatography (TLC) technique. 81 percent of the patients were found to have blood nicotine levels that were more than 0.5 micrograms per millilitre.

In the event that tobacco use is continued for an extended period of time, there is a concerning risk of developing laryngopharyngeal cancer.

Conclusion

Using tobacco and its products for an extended period of time and in excessive amounts seems to be a significant

contributor to the development of laryngopharyngeal malignancies. It has been shown via a number of research conducted in India that tobacco use is a significant risk factor that contributes to an increase in the incidence of laryngeal cancer diagnosis. When a person stops using tobacco, they have a significant reduction in the number of pathologic lesions that affect the larynx, as well as a regeneration of the lining epithelium and mucociliary transport.

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