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Research Article

Secondary neck nodes from squamous cell carcinoma: a study of 67 patients from Tamil Nadu

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ABSTRACT

Background: In the present study, nine areas of the head and neck inclusive of five primary sites in the oral cavity and three in the oropharynx and the maxillary antrum were examined in the patients presenting with squamous cell carcinoma of the head and neck.
Methods: 67 subjects with histologically proven squamous cell carcinoma with varying degrees of differentiation were included in the study.
Results: It was found that 20% of the patients were in the age group of 31 to 40 years, 55% were in the age group of 41-50 years, 16.6% were in the age groups of 51 to 60 years and 8.3% were in the age group of 61 to 70 years. In patients with lesions smaller than 2 cm, 44.44% percent subjects had cervical node metastases; whereas in patients with lesion size between 2.1 to 4 cm, 75% had cervical node metastases. However, in subjects with lesion size above 4 cm, 100 % of the patients had cervical node metastases. Patients with large primaries of greater than 4 cm and those with higher histological grade ranging from moderate to poorly differentiated metastases showed a greater prevalence of nodal regional metastases compared to the rest. With decreasing degree of differentiation, an increased prevalence of nodal metastases was observed.
Conclusions: This study suggests an early age of occurrence of squamous cell carcinoma in our population and increase in cervical nodal metastases with increasing tumor size and decrease in degree of differentiation.

Keywords: Squamous cell carcinoma, Head, Neck, Oral cavity, Oropharynx, Maxillary antrum

INTRODUCTION

Squamous cell carcinoma of the head and neck primarily comprising of local invasion and subsequent cervical lymph node metastasis is one of the most aggressive cancer types. The mortality rate in a period of 2 years, owing to metastasis is 88%.[1] Declining patient survival in head and neck squamous cell carcinoma is closely associated with distal metastasis.[2] The invasion is a multistep process that involves the breaching of the basement membrane, migration of the tumor cell through the extracellular matrix (ECM) of the stroma. This is followed by intravasation through the vasculature and subsequent extravasation in the site of metastasis. Protein degradation in the extracellular matrix is one of the key steps that facilitate spreading of the tumor cells.[3] Also, genetic studies have proved that the involvement of genes encoding for angiogenic factors is crucial for the development of squamous cell carcinoma of the head and neck. This is because of the fact that the extent of neovascularization near the tumor is determined by the complex interplay between the negative and positive regulators of angiogenesis.

Risk factors like poor oral hygiene, non-vegetarian food, poor dentition, smoking, tobacco chewing, and alcohol

have been known to contribute to squamous cell carcinoma of head and neck.[4] Due to the widespread habit of tobacco chewing among both males and females in India, squamous cell carcinoma of the head, neck and oropharyngeal region is the fifth most prevalent cancer in India. For instance, in a study conducted at a cancer centre in India, 6.3% of males and 3.7% of females had tongue cancers.[5] A clear comprehension of the epidemiology and risk factors associated with oral cancers can help identify oral cancers early and provide treatment in a prompt manner. Early diagnosis is also important in the context that early initiation of therapy is associated with a better degree of prognosis. Also, late diagnosis is directly associated with increased mortality and morbidity.

In the present study, nine areas of the head and neck inclusive of five primary sites in the oral cavity and three in the oropharynx and the maxillary antrum were examined in the patients presenting with squamous cell carcinoma of the head and neck. Thus in the present we analyzed study prevalence of nodal metastasis commonly involved according to the primary tumor at the time of presentation.

METHODS

Subject selection

This study was conducted as a cross-sectional and prospective study on a sample of 67 patients attending the surgical department of Raja Muthiah medical college and hospital during the period between June 2011 to May 2013. The study subjects had a clinical diagnosis of carcinoma of the oral cavity, oropharynx or maxillary antrum.

Inclusion criteria

Subjects were included in the study, if they had histologically proven squamous cell carcinoma with varying degrees of differentiation.

Exclusion criteria

7 Subjects were excluded from the study for the following reasons,

- Presence of pseudoepithelimataous hyperplasia without any evidence of malignancy
- Cases reported as adenocarcinoma arising from Ulcer in the lower lip
- Cases with adenoid cystic carcinoma of the buccal mucosa

Hence the final sample size of the study was 60 subjects. On admission, a complete medical history including the nature of the complaints, duration and other associated conditions was obtained from the patients. More attention was paid to factors that contribute towards malignancy like the presence of a non-healing ulcer, throat pain for a duration of more than 2 weeks, Red or white patch in the oral cavity, a neck mass that is enlarging and non-tender in nature, addiction towards tobacco and/or betel leaves chewing, alcoholism, stuff sniffing, irradiation to head and neck in the past, previous treatment for other carcinomas of the head and neck. Further note was made on the triangle and side of the neck, the total number of nodes that are palpable, the involved groups, consistency, size, tenderness, fixity to the skin and the node and the N stage of the nodes. On enlargement of the nodes that belong to the deep cervical chain, they were included in the cervical triangle of the anterior with respect to their position. This is because the standard description of the cervical triangle does not include the nodes that are deep to sternocleidomastoid muscles from either of the two major triangles. Midline nodes were taken as homolateral nodes. In assessing the size of the nodal mass, allowances were made for the soft tissues that intervene. Informed consent to participate in the study was obtained from the patients. Ethical approval was obtained from the institutional ethics committee of the Raja Muthiah medical college and hospital.

Indirect laryngoscopy

Complete physical examination of the patients was done. This included an indirect laryngoscopy in selected cases to elucidate the characteristics of the primary in terms of extent, size and the site. Further attention was paid to the appearance of macroscopic structures, extent of local infiltration, T stage of tumor and the presence of other synchronous lesions. Briefly, the patient was asked to sit upright with a straight back and slightly leaning with the chin that points upward. The presence of laryngeal mirror, gauze sponges, alcohol lamp or hot water, adequate lighting was ensured.

Sitting in a position higher to that of the patient, anesthetic was applied to the pharynx and the patient was asked to gargle and spit. The patient was asked to stick out the tongue which was then covered with gauze and pulled with the thumb and middle finger. The patient was made to breathe in and out and the mirror was directed into the mouth and towards the back of the throat ensuring the position of the glass side to be downward. Then the mirror was pressed up, against soft palate and uvula. The desired structures were visualized using various angles and the vocal cord activities were checked.

Biopsy

Biopsy of the primary site was done for all study participants as a histological confirmation and the degree of differentiated was also noted. This was expressed as three grades as follows: well differentiated, moderately differentiated and poorly differentiated.

Statistical analysis

All statistical analyses were performed using SPSS version 15.0 for Windows (SPSS, Inc., Chicago, IL). Frequencies and percentages were used to represent nominal data like gender, causes of lower gastrointestinal bleeding etc.

RESULTS

Figure 1 displays the prevalence of cervical node metastases in the study population. 73% of the subjects had palpable nodes in the neck on admission.

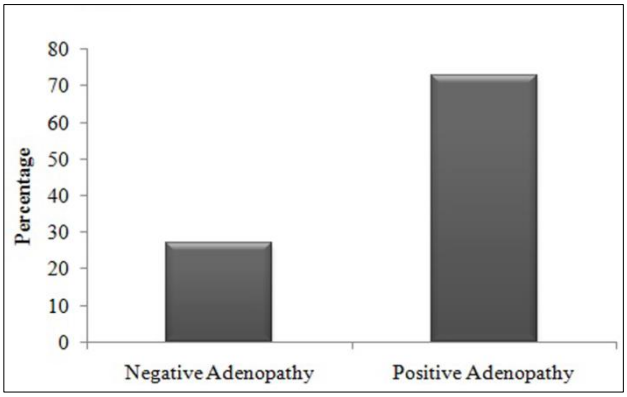

Figure 1: Incidence of cervical node metastases.

Figure 2 elicits the age wise distribution of subjects with secondary node metastases. It was found that 20% of the patients were in the age group of 31 to 40 years, 55% were in the age group of 41-50 years, 16.6% were in the age groups of 51 to 60 years and 8.3% were in the age group of 61 to 70 years. Hence secondary node metastases were found to be highly prevalent in the fourth and fifth decades of life. Among the 60 patients with proven squamous cell carcinoma proven histologically, 58% were males and 42% were females. On admission palpable neck nodes were detected in 68% males and 32% females.

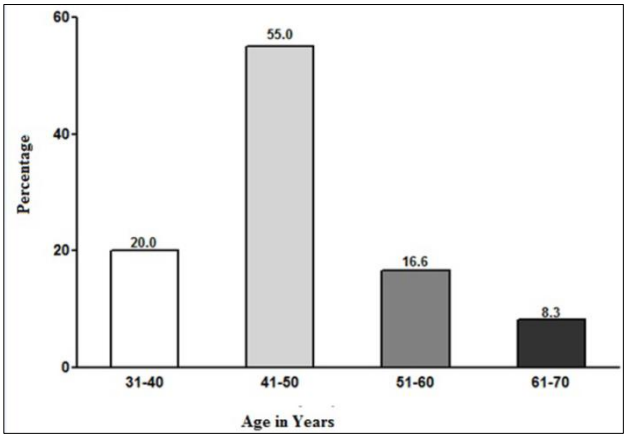

Figure 2: Age incidence of primary cervical node metastases.

Figure 3 shows the correlation between the size of the tumor and cervical node metastases. A progressive increase in the prevalence of cervical node metastases was observed with increase in the tumor size. In patients with lesions smaller than 2 cm, 44.44% percent subjects had cervical node metastases; whereas in patients with lesion size between 2.1 to 4 cm, 75% had cervical node metastases. However, in subjects with lesion size above 4 cm, 100 % of the patients had cervical node metastases.

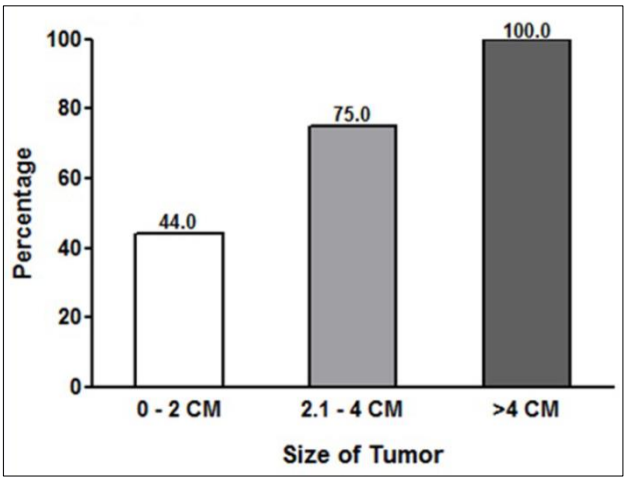

Figure 3: Correlation between tumor size and cervical node metastases.

Figure 4 shows the correlation between the grade of tumor and the prevalence of cervical node metastases. Patients with large primaries of greater than 4 cm and those with higher histological grade ranging from moderate to poorly differentiated metastases showed a greater prevalence of nodal regional metastases compared to the rest. With decreasing degree of differentiation, an increased prevalence of nodal metastases was observed.

Regional nodal metastases showed a good correlation with the site of the primary. Tumors situated posteriorly and arising from the orapharyngeal regions like the base of the tongue, tonsils and soft palate displayed a greater propensity for regional metastases (66 to 100%) as compared to tumors situated in the anterior region and arising from the oral cavity (33 to 83%). Carcinoma of the tonsils and carcinoma of the buccal mucosa showed highest progression to nodal metastases in the posterior (100%) and anterior regions (83.33%) respectively. When the topographical distribution of the primary was analyzed, involvement of certain nodal groups of the neck was observed in a higher proportion. Carcinoma of the buccal mucosa, alveolus, floor of the mouth and maxillary antrum metastasized predominantly to the submandibular nodes. Carcinoma arising in the tongue, tonsils and soft palate predominantly metastasized to the upper deep cervical group. Though not frequent, bilateral metastases were observed more commonly in the carcinoma of the base of the tongue and carcinoma of the anterior 2/3rd portion of the tongue.

DISCUSSION

The major findings of the study were as follows: study subjects in the age groups of 41 to 50 years had a higher prevalence of secondary node metastases compared to those in the younger and the older age groups. Palpable nodes in the neck were present in a higher proportion in males compared to females. With increase in tumor size, a progressive increase in the prevalence of cervical node metastases was observed. With decreasing degree of differentiation, an increased prevalence of nodal metastases was observed. Posterior tumors displayed a higher propensity towards regional metastasis compared to anterior tumors.

Squamous cell carcinoma of the head and neck is a heterogeneous disease in terms of anatomical as well as molecular biology aspects. Owing to the easy acceptance of unhealthy lifestyle habits by males, the prevalence of oral cancer has been shown to be higher in males in many of the populations. In our population the male: female ratio was found to be 1.3:1. In case of other populations like the Greek population, a ratio as high as 9.2:1 was observed.[6] Chewing betel leaves, tobacco and smoking tobacco in higher numbers by males predisposes them to develop oral cancers. In the Indian scenario, both alcohol and tobacco consumption by females is considered a taboo by the society and this could be the reason behind the lower prevalence of oral cancers in female. However, an increase in the adoption of these habits by females is now making them catch up fast with the trend.

Our study showed that the highest prevalence of head and neck squamous cell carcinoma was observed in the fourth and fifth decades of life. Also patients in the age group of 31 to 40 years also showed a higher incidence. Our results agree with a study done earlier in the eastern part of India.[7] On the other hand, the mean age of diagnosis has been shown to be around 65 years by the U.S national cancer institute.[8] This increasing prevalence of oral cancers in early decades of life compared to western population could be due to the fact that oral hygiene is better observed in the western world and the tobacco products are available at a cheaper cost in India.

The site of occurrence of oral cancers has been shown to vary widely in many studies. Some of the common sites of lesions were found be lip, tongue and mouth floor, labial mucosa, lateral tongue border, retromolar region, palate etc.[9] However in our study base of the tongue, tonsils and soft palate and buccal mucosa were found to be the frequent sites of occurrence that progressed to metastases. Our study also showed that, with increase in the size of tumor and a decrease in the degree of differentiation, the prevalence of cervical node metastases increased.

A considerable proportion of study participants had advanced stage of the disease which shows that there is a negligence of oral hygiene and health care among the population. In order to prevent the increasing incidence of squamous cell carcinoma of the head and neck, there is an urgent need for educational campaigning against tobacco, betel leaves and nut and alcohol consumption.[10] Also, the high risk populations should be screened early and the importance of diagnosing the disease early for the survival of the patient should be emphasized. Early diagnosis could also improve the quality of life and reduce cost of treatment in patients with squamous cell carcinoma of the head and neck.

Though the study findings require validation through large scale studies, this study, in conclusion projects an early age of occurrence of squamous cell carcinoma in our population and increase in cervical nodal metastases with increasing tumor size and decrease in degree of differentiation.

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