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CORRELATIVE STUDY BETWEEN HISTOLOGICAL GRADE AND LYMPH NODAL METASTASES IN HNSCC

Medicine

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ABSTRACT

Background: Head and Neck squamous cell carcinoma (HNSCC) are among the top 3 cancers in India and accounts for 30 % of the country's cancer burden. In this study, we will focus on the lymph nodal metastasis from Head and Neck cancers regarding facts, such as incidence; stage, histopathology and grade of primary tumor. **Study design:** All patients of head and cancer who were operated in a period of four years in the department of surgical oncology, Sri Aurobindo Medical College & Hospital, Madhya Pradesh, were included in the study. Data is gathered from in patient files, operative records and Histopathology records. **Results:** Buccal mucosa is the most common site of cancer (42.6%). Incidence is common in male population and male to female ratio is 2.5:1.Most patients presented in middle age and stage IV is the most common presentation. 86.4% of tumors are low grade. High grade tumors presented with advanced stage and more number of metastatic lymph nodes. **Conclusion:** Location of primary tumor pattern of invasion, histologic grade, disease stage, will influence the lymph node metastasis, and prognosis in HNSCC. Assessments of mentioned parameters are beneficial in selecting patients who need more aggressive treatment modalities.

KEYWORDS:

Squamous Cell Carcinoma, Metastasis, Histological Grade,

Introduction:

Squamous cell carcinoma is the most common histological type of cancer of the oral cavity, and has an important and well-established pattern of dissemination to cervical lymph nodes. [1] Even in patients clinically without evidence of metastatic lymph nodes (N0), elective neck dissection in conjunction with resection of the primary tumor, is part of the standard treatment of the disease because the risk of occult metastasis is greater than 20%. [1-6]. The status of the regional lymphatics is one of the most important prognostic indicators in patients with head and neck cancer. HNSCCs that are localized to the primary site without regional lymph node metastases have excellent cure rates with either surgery or radiation therapy. The presence of regional metastases results in cure rates that are approximately half of those obtainable if metastasis to the regional lymphatics is not present. Thus the treatment of the neck has become one of the most actively debated topics in the field of head and neck oncology. For the regional metastasis to occur, it is necessary for tumor cells to enter the micro vessels to gain the pathway to the lymphatic channels. After entering the tumor-draining lymphatic channels, the tumor cells migrate to the regional lymph nodes in the neck, in which they settle and form the foci of micro metastasis. The present study aimed to evaluate the risk of lymph node metastases in patients with HNSCC submitted to resection and neck dissection, in order to identify factors related to the development of nodal metastases.

Methodology:

Two hundred and thirty seven patients with HNSCC who underwent surgical management between 2012 and 2016 were analyzed retrospectively. All patients had curative surgery as their initial treatment for the primary tumor and neck. A total of 237 neck dissections were performed. Unilateral neck dissections were done in 208 patients, bilateral neck dissections in 12 patients and SOHND in 17 patients. Specimen is sent in 10% formalin solution to the pathology department. Tumor size, tumor differentiation, lympho vascular invasion, perineural spread and total number of positive lymph nodes were recorded. Data was analyzed using SPSS (Statistical Analysis Software Package).

Results:

Table 1 shows the distribution of cases according to age and sex. Mean age at presentation is 57 years with a range of 30 to 90 years. Incidence is more among male population with a ration of 2.5:1. Most of the patients have history of tobacco addiction in form of chewing or smoking.

Table 1: Demographics and distribution of cases

Demographics	Distribution of cases
male	170
female	67
Male: Female	2.5:1
Mean age	57 years

Most common sub site was buccal mucosa {42%) followed by alveolus and tongue. Central arch and maxillary tumor have the lowest incidence in our study with incidence of 2% each.

Table 2: Diagnosis of the patient

Site	Frequency	Percent
Buccal Mucosa	101	42.6%
Alveolus	43	18.1%
Tongue	42	17.7%
Larynx	13	5.5%
Lip	7	3.0%
GB Sulcus	12	5.1%
Central Arch	5	2.1%
Maxilla	5	2.1%
RMT	9	3.8%
Total	237	100.0

86% of tumors are low grade and only 1% is high grade tumors. Most tumors are stage IV (51%) followed by stage II (24%) at presentation. All high grade tumors presented with late stage disease.

Table 3:Tumor grade * stage of the patient Cross tabulation

		Stage of tumor at presentation				Total
		Stage I	Stage II	Stage III	Stage IV a	
Tumor grade	Low grade	13	52	38	102	205(86.4%)
	Intermediate grade	1	6	6	16	29(12.2%)
	High grade	0	0	0	3	3(1.2%)
Total		14	58	44	121	237

Of the 237 patients 203 patients presented with low grade disease. 31 were the lowest age at presentation and 92 was the maximum age. Most of the patients presented between 45 to 75 years of age group. There was no relation between age and tumor grade.

Table 4: Age of the patient * tumor grade Cross tabulation

		Tumor Grade		
		Well differentiated	Moderately differentiated	Poorly differentiated
Age of the patient	30-40	7	0	0
	40-50	40	6	0
	50-60	55	8	2
	60-70	51	9	0
	70-80	41	4	1
	80-90	8	1	0
	90-100	2	1	0
Total	86.4%	12.2%	1.2%	

All the patients underwent resection of primary with neck dissection. Out of 237 cases 119 cases had no nodal disease. There is correlation between tumor grade and number of positive lymph nodes.

Table 5: Number of positive lymph nodes

		No Positive Nodes	≤4 Lymph Nodes	5-10 Lymph Nodes	> 10 Lymph Nodes	Total
Tumor Grade	Low Grade	108	95	2	0	205
	Intermediate Grade	11	5	11	2	29
	High Grade	0	0	1	2	3
Total		119	100	14	4	237

Discussion:

HNSCC is a multifactorial disease. It has a remarkable incidence worldwide and has fairly burdensome prognosis. Though some of the factors proved to be causative agents like tobacco, alcohol and human papilloma virus, the prognosis of disease is also determined by many other factors. These factors range from simple demographic factors like age and sex to clinical and histopathological factors. Chen et al. suggested that predictive factors in oral and pharyngeal carcinoma survival are: Ethnic groups, period of diagnosis, gender, diagnostic age, anatomic site, type, and therapy [7]. It has been observed in literature that many authors have tried to show the correlation of some independent factors or group of factors with prognosis of patients with HNSCC. But none of the factor can alone influence the prognosis of individual with HNSCC. While determining the prognosis of individual with HNSCC all the factors like demographic, general physical factors, clinical factors, histological factors, and molecular factors should be taken in to consideration. Following are various clinical implicators in the prognosis of HNSCC.

Prognostic factors in HNSCC

	Demographics factors	Pathological factors	Lymph node Factors
Parameters	Age Gender Race Habits Co morbidities	T Stage Tumor thickness Total tumor volume Tumor margin Tumor grade Perineural spread Lympho vascular spread	Number of positive lymph nodes Nodal location Nodal size Extra capsular extension

In the present study incidence of HNSCC is higher in mean compared to women (2.5:1) as men indulge in high risk habits compared to women. Mean age at presentation is 57 years as compared to study conducted by Warnakulasuriya where the mean age is 45 years [8]. In western countries mean age at presentation is 62 years. The anatomic location of the lesion could also be considered as a prognostic indicator, since the tumors behave differently depending on anatomic location. Tumors of tongue, soft palate and floor of the mouth have worst prognosis for HNSCC due to the frequent presence of cervical metastases, inaccessibility, and late reporting by patients[9][10].

Histological parameter contributed most strongly in determining the prognosis and pattern of invasion was an independent predictor for prognosis. Tumor cells invading in the form of small clusters or groups or in a dispersed pattern was associated with poor prognosis. In addition to pattern of invasion, lymphoplasmacytic infiltration also had a prognostic implication. In the present study most of the tumors were of low grade and only 1% of tumors presented with high grade disease. The presence of perineural invasion (PI) in primary tumor is a predictor for cervical metastasis, loco regional recurrence. Centripetal and centrifugal propagation of tumor cells along perineural spaces and away from primary tumor is responsible for local recurrence. [11] Vascular invasion is defined as, "the presence of neoplastic cells within an endothelial cell lined channel." It occurs in more than 50% of head and neck squamous cell carcinomas (HNSCCs). It correlates with the presence of concomitant cervical metastases and showed an increased risk of distant metastatic disease. [12] The skin of face and scalp is most commonly affected by metastases, suggesting that blood vessels and patterns of innervations may influence the spread of metastases. [13]

Lymph nodes histologically positive for HNSCC provide one of the simplest and perhaps the most important markers in head and neck cancer. Small well-differentiated, low-grade oral SCCs usually metastasize to regional lymph nodes only after invading connective tissue, muscle or bone. On the other hand, poorly-differentiated, high-grade oral SCCs are biologically more aggressive and tend to metastasize to regional lymph nodes early in the course of the disease [15].Lymph node number exhibited a strong dose-response correlation with distant metastasis and survival.[14] It also indicated the risk for regional recurrence and distant metastasis. In the present study there is correlation between grade of tumor and number of positive lymph nodes.

Conclusion:

The relationship of stage of disease, degree of differentiation and lymph node metastasis was analyzed in this study. A significant relation was noticeable between the degree of differentiation and metastasis in the lymph nodes, indicating that the histological grade could serve as a predictor for metastasis in the cervical nodes. Location of primary tumor pattern of invasion, histological grade, disease stage, will influence the lymph node metastasis, and prognosis in HNSCC. Assessments of mentioned parameters are beneficial in selecting patients who need more aggressive treatment modalities.

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