Available Online at http://www.journalajst.com

ASIAN JOURNAL OF SCIENCE AND TECHNOLOGY

ISSN: 0976-3376

Asian Journal of Science and Technology
Vol. 08, Issue, 07, pp.5158-5162, July, 2017

RESEARCH ARTICLE

TOPOGRAPHICAL DISTRIBUTION OF LARYNGEAL CANCER

[1]Rajnee Malhotra, [2,*]Sumeet Angral, [3]Ritu Raj and [4]Deepakshi Angral

[1]Senior Medical Officer at Rajiv Gandhi Hospital, Gangyal, Jammu
[2]Post Graduate in Deptt., of ENT and Head & Neck Surgery, Govt. Medical College, Jammu
[3]Post Graduate in the Deptt., of Medicine, Govt. Medical College, Jammu
[4]B.DS Intern at Indra Gandhi Dental College, Jammu

ARTICLE INFO

Article History:
Received 18th April, 2017
Received in revised form
17th May, 2017
Accepted 24th June 2017
Published online 30th July, 2017

Key words:
Laryngeal Cancer,
Metastasis.

ABSTRACT

INTRODUCTION: Laryngeal cancer which is about 2% of all the malignancies occupies an important position amongst all head & neck cancers, since it effects speech and language. Laryngeal carcinoma is predominantly a male disease. The exact cause of laryngeal cancer is unknown. Prognosis is inversely related to N Stage and M stage and persistence of the disease at the primary site.

AIMS AND OBJECTIVES: To evaluate socio- demographic – characteristics, site and subsite distribution of Laryngeal cancer as well as the stage of Laryngeal cancer time of presentation.

MATERIAL AND METHODS: The study was conducted in the Deptt. Of ENT, Head and Neck Surgery, SMGS Hospital Govt. Medical College, Jammu extending over a period of one year from Nov, 2014 to Oct.2015, comprising of 50 patients. Detailed clinical history, clinical examination (including Indirect laryngoscopy and neck examination) was carried out in all the case. Other incestigations like routine investigatins, CT scan, Barrium swallow, direct laryngoscopy were also undertaken. Biopsy was taken from all the fifty patients for histopathological confirmation of diagnosis and for categorizing the type of tumour.

RESULTS: CARCINOMA LARYNX occurs commonly in age group of 50-70 years,with male predominance and is more in smokers. Supraglottic carcinoma was the most common type of malignancy seen (62%), followed by glottic in 34% cases and subglottic in only 4%. Aryepiglottic was the most common subsite. Squamous cell carcinoma was the most common type of lesion seen histologically.

INTRODUCTION

Malignancy has been defined by Sir Rupert Wills "as a group of abnormal mass of tissues, the growth of which far exceeds & is uncoordinated with that of the normal tissues & persists in the same excessive manner after cessation of stimuli which evoked the changes"[WHO Technical Report]. No human tissue is immune to malignancy. The crude incidence rate of cancer in India is 44.1 per 100.000 populations [ICMR 1992]. Head and neck cancer which constitute about 30-35% of total body cancers in india, comprises only 5% in western world (Parkin et al., 1994). Laryngeal cancer which is about 2% of all the malignancies occupies an important position amongst all head & neck cancers, since it effects speech and language. Very high incidence[more than 10 per 1 lakh of population]of the disease has been reported in countries like Brazil, France and India, while there is very low incidence [less than 2 per 1 lakh population] of carcinoma larynx in Sweden and other Nordic countries (Whelan, 1990).

****Corresponding author: Dr. Sumeet Angral,***
Post Graduate in Deptt., of ENT and Head & Neck Surgery, Govt. Medical College, Jammu

The incidence is the highest in asian sub-continent. India being a very vast country, there is a great variation in the frequency of cancer of larynx, being lowest in northern states but increases towards southern and eastern parts (Paymaster, 1959). Laryngeal carcinoma is predominantly a male disease. The male to female ratio for glottis lesions is 12:1, for supraglottic lesions is 4:1 and for subglottic lesions is 5:1, with an average of 6:1 (Whelans, 1992). There is a marked social class difference too, while glottis cancers are seen commonly in both ends of the social classes i.e extremely rich and the poor, supraglottic lesions have highest incidence amongst the poor (Goura, 2004). As with other head and neck cancers the incidence of laryngeal cancers increases with age, mostly occurring in the patients aged between 40-70 years & peak incidence is in the 6th decade. Supraglottic and subglottic tumours seem to occur in slightly younger age which may be due to different etiological factors. The exact cause of laryngeal cancer is unknown. There is no single proven etiological factor, but there are several inter-related factors which are clearly associated with the increased incidence of laryngeal cancers. Personal habits like smoking & alcohol are indisputable risk factors and seem to act synergistically.

Asbestos, wood dust, solvents previous irradiation, prolonged vocal strain and dietary deficiencies have also been blamed. Further studies are needed to identify genetic factor that may be of etiological interest. Laryngeal keratosis &leukoplakia are related to carcinoma of the larynx, metaplasia although related to smoking has not yet received designation as clear precussor of neoplasia (DeStefani et al., 1987). The laryngeal surface of the epiglottis and free edge of the vocal cords are lined with stratified squamous epithelium whereas rest of larynx is lined with pseudostratified columnar epithelium. Nearly all the malignant tumours of the larynx arise from the surface epithelium & therefore are squamous cell carcinomas, or one of its variants. Most of the vocal courd carcinomas are either well differentiated or moderately differentiated, whereas supraglottic lesions are less differentiated than that of the vocal cords. Majority of the malignant tumours of the larynx are squamous cell carcinomas [95%] & other rare histological types include the squamous cell variants- spindle cell carcinoma, adenosquamous carcinoma, adenocarcinoma, sarcoma and verrucous carcinoma [akermen's tumour] which is characterized by a well differentiated keratinizing epithelium. With few mitotic figures and no cellular atypia (Sidransky, 1997). The topographic distribution of laryngeal cancers with various sites and subsites of the larynx has been defined by International Union Against Cancer(IUAC) in its international Classification Of Disease for oncology ICD - 0161 which was revised in 1997 [Walkinson, 2004]. on the basis of topographical study, laryngeal cancer can be divided into supragotic ,glotic and subglotic.

According to IUAC 1997 supraglottis consists of

- Suprahyoid epiglottis including tip ,lingual ,(anterior) and laryngeal surfaces.
- Aryepiglottic fold ,laryngeal aspects.
- Aretynoid
- Infrahyoid epiglottis
- Ventricular bands

While glottis comprises of

- Vocal cords
- Anterior commisure
- Posterior commisure

Glottis carcinoma may be divided into small tumours that arise in one vocal cord and remain localized to it for long periods and those tumours often called transglottis that involve large part of the laryngeal surface .cross the vocal cords and are extensive when seen first. Available literature shows that glottis lesions are most common (55%) followed by supraglottic(40%) & subglottic (less than 5%). As far as site specific distribution is concerned, aryepiglottic folds is the most commonly affected site in supraglottic cancers followed by ventricular bands and the suprahyoid epiglottis. Infrahyoid epiglottis & aretynoid are equally affected. In the glottis lesions the most common site is the free margin of the vocal cord followed by the anterior commisure and the posterior commisure. In the subglottic cancer, extensions from the glottis are far more common as compared to primary subglottic lesions (Raychowdhary et al., 2002). The staging of the carcinoma of larynx is very important for management point of view. At present UICC / AJCC / TNM 1998 Staging System is being followed all over the world. The system is as under :-

Supraglotic cancers

Tis - carcinoma in situ.
T1 - tumour confined to one subsite of supraglottis with normal vocal cord mobility.
T2 - Tumor involving more than one subsite of supraglottis or glottis or both , valleculla , medial wall of pyriform sinus with normal vocal cord mobility.
T3- Tumor limited to larynx with vocal cord fixation and \ or extension to involve the postcricoid area , or preepiglottic space.
T4- Massive tumours beyond the confines of larynx to involve the oropharynx , soft tissue neck, and destruction of thyroid

Glottiic Cancers

Tis- Carcinoma in situ.
T1- Tumour confined to the vocal cord (s), with normal mobility (includes involvement of the anterior or posterior commisure.
T1a- Tumour limited to one vocal cord.
T1b- Tumour involving both vocal cords.
T2 - Tumour with supraglottic or subglottic extension ,or both with normal or impaired cord mobility.
T3 - Tumour confined to larynx with vocal cord fixation.
T4 - massive tumour with thyroid cartilage destruction and or extension beyond the confines of the larynx to other tissues (oropharynx ,soft tissue of the neck)

Subglottic cancer

Tis - Carcinoma in situ
T1 - Tumour confined to subglottic region.
T2 - Tumour extending to vocal cord(s) , with normal or impaires mobility.
T3 - Tumour confined to the larynx , with vocal cord fixation.
T4 - Massive tumour with cricoids or thyroid cartilage destruction and or extension beyond the confines of the larynx to other tissues.

TNM classification of regional nodes

Nx Regional lymph nodes cannot be assessed.
N0 No regional lymph node metastasis.
N1 Metastasis in a single ipsilateral lymph node 3 cm or less in greatest dimention.
N2 Metastasis in a single ipsilateral lymph node, more than3 cm but not more than 6 cm in greatest dimention ,or in multiple ipsilateral lymph nodes not more than 6 cm in greatest dimension , or in bilateral or contraletral lymph nodes ,not more than 6 cm in greatest dimention.
N2a Metastasis in a single ipsilateral lymph node more than 3 cm but not more than 6cm in greatest dimention .
N2b Metastasis in multiple ipsilateral lymph nodes, not more than 6 cm in greatest dimension.
N2c Metastasis in bilateral or contralateral lymph nodes, not more than 6 cm in greatest dimension.
N3 Metastasis in a lymph node more than 6 cm in greatest dimension.

Distant Metastasis (M)

MX Distant metastasis cannot be assessed.
M0 No distant metastasis.
M1 Distant metastasis.

The TNM staging system is only an anatomical means of classification which takes into account neither the biological aggressiveness of various neoplasms nor the other intrinsic host factors. It has been felt by many head and neck oncologists that the TNM stage does not provide the best guideline for treatment and prognosis for an individual patient The Laryngeal cancer Association has collected a worldwide survey of expert's opinion regarding the applicability of the TNM system. The most favourable outcome is seen in a low T stage , a low N stage , and an absence of M. This survey found consensus regarding several factors outside the TNM system [Baliey, 1990] which influence the treatment outcome:

- Absence of extra – capsular spread.
- Clear resection margin.
- Glottic location of primary (rather than supraglottic or Subgblottic or transglottic).
- Cessation of smoking and alcohol intake.

The prognosis and 5 – years survival of carcinoma of larynx after treatment (either surgery radiotherapy or both) depend upon the histological type. Anatomical location and extent of the involvement . An adverse prognosis for laryngeal cancer related to both the size of the primary tumour and the site , with a better prognosis being related to then glottis disease. Prognosis is inversely related to N Stage and M stage and persistence of the disease at the primary site. Since India is known for diversity of its population characteristics, the trends, site pattern and risk factors for laryngeal malignancy also varies from place to place within the country . Site specific data from different n parts of the country provide us various trends and gives clues to the aetiological factors responsible for these significant variations. This study "Topographical Distribution Of Laryngeal Cancer " is an essential indicator of the magnitude and the pattern of carcinoma of larynx in Jammu region. It will also be useful in monitoring patients of carcinoma larynx and preparing further statergies for management of disease in our setup.

AIMS AND OBJECTIVES

- To evaluate socio- demographic - characteristics of Laryngeal cancer.
- To evaluate site and subsite distribution of Laryngeal cancer.
- To evaluate the stage of Laryngeal cancer at the time of presentation,
- To evaluate the cytohistopathological type of Laryngeal cancer .

MATERIALS AND METHODS

The study titled "Topographic Distribution of Laryngeal Cancer" was conducted in Post – Graduate Deptt. Of E.N.T. and Head and Neck Surgery ,SMGS Hospital Govt.
Medical College, Jammu extending over a period of one year from Nov,2014 to Oct.2015. The study comprised of fifty patients who reported in the Deptt. Of E.N.T. and Head and Neck Surgery with signs and symptoms suggestive of Laryngeal malignancy such as hoarseness of voice, dyspnoea\ stridor, dysphagia haemoptysis neck nodes, weight loss and generalized weakness etc. Detailed clinical history, general physical examination , both systemic and local examination (including indirect laryngoscopy) was carried out in all the case.

Indirect laryngoscopy was done to find out:

- The appearance of lesion wheather exophytic, nodular, ulcerative or infilterative.
- To see site and sub- site and also extent of the lesion.
- Vocal cord mobility – wheather freely mobile, impaired or fixed.

Detailed neck examination was carried out in all the patients for metastatic lymph nodes for their size , site , number , mobility and whether they were unilateral, bilateral or contralateral. All the cases were subjected to a protocol of investigation as specified in plan which varied from case to case as per symptomatology and treatment modality. Complete haemogram, Renal function tests, Liver function tests, ECG and X-ray chest carried out in all the patients were within normal limits. All the patients were subjected to X-ray soft tissue neck-AP and lateral views. Barium swallow was carried out in six patients where lesion was suspected to involve Pyriform sinus and Post –cricoid region. In all the six patients, barium swallow study was found to be within normal limits. CT-Scan neck including chest was done in 23 patients to find out the extent of the growt , occult neck and chest metastasis . All the patients were subjected to USG Abdomen to rule out abdominal metastasis. In all the cases it was found to be within normal limits.

Direct laryncoscopy was carried out in 38 patients under general anesthesia to find out:

- Extent of the tumour.
- The clinical type of tumourt-ulcerative, proliferative or infilatgrive.
- To examine blind areas of laryngopharynx.
- To take biopsy from representative site to confirm diagnosis and staging of the primary tumour.

However, in twelve patients who were not fit for general anesthesia, Flexible Fibre- Optic laryngoscopy was done to record the aforesaid observations. Bronocoscopy and Oesophagoscopy was done in three patients who later on underwent total larygectomy. Biopsy was taken from all the fifty patients for histopathological confirmation of diagnosis and for categorizing the type of tumour. Thirty – eight patients with significant palpable neck nodes required Fine Needle Aspiration Cytology.

Observations

PATIENT CHARACTERSTICS AGE & SEX DISTRIBUTION

Age(years)	No. of patients		Total %
	Male %	Female %	
31-40	0 0	01 2	01 2%
41-50	04 8%	04 8	08 8%
51-60	21 42%	01 2	22 42%
61-70	10 20%	01 2	11 22%
71-80	06 12%	01 2	07 14%
81-90	01 2%	0 0	01 02%
Total	42 84%	08 16%	50 100%

66% patients in the study group were from the age group of 51 to 70 years. 16% patients were females while 84% patients were males. The youngest female of 38 years, while the oldest patient was a male of 90 years.

Male to female ratio was 5.25: 1

INCIDENCE OF TOBACCO & ALCOHOL USE IN 50 CASES OF CARCINOMA LARYNX

Addiction	No. of cases		Total
	Male	Female	
Tobacco User	42	8	50
Alcohol User	28	0	28

All patients had a history of tobacco use while only 56% patients were alcoholic. Interestingly all the females were smokers but none was alcoholic.

DURATION OF TOBACCO USE IN 50 CASES OF CARCINOMA LARYNX

Duration in years	No. of cases	percentage
1 - 10	2	4
11 - 20	6	12
21 - 30	18	36
31 - 40	12	24
Above 40	12	24
Total	50	100

84% of the patients were smoking since last 20 40 years.

MODE OF TOBACCO USE IN 50 CASES OF CARCINOMA LARYNX

Mode of tobacco use	No.of cases	Percentage
Bidi smoking	2	4
Hukka	3	6
Cigarette	24	48
Cigarette & hukka	17	34
Bidi & hukka	2	4
Cigarette & bidi	1	2
Chewing tobacco	1	2

Hukka and smoking were the most common mode of tobacco use in patients in the study group. 94% patients had history of using these two modes of tobacco either alone or in the hospital.

PRESENTING SYMPTOMS OF 50 PATIENTS OF CARCINOMA LARYNX

S.no	Complaint	No. of patients	Percentage
1.	Hoarse voice	38	76
2.	Dysponea	05	10
3.	Stridor	10	20
4.	Dysphagia	28	56
5.	Neck swelling	06	12
6.	Pain throat	13	26
7.	Weight loss	18	36

Hoarse voice was the most common (76%) presenting symptom at the time of presentation. 56% patients presentd with history of dysphagia. Deep cervical lymphadenopathy was the 3rd most common symptom observed.

REGIONAL DISTRIBUTION OF 50 CASES OF CARCINOMA OF LARYNX

Region	Male	Female	Total
Supraglottic	24	07	31(62%)
Glottis	16	01	17(34%)
Subglottic	02	00	02(4%)
Total	42	08	50(100%)

Supraglottic region was the most common site (62%) involved,while glottis involvement was seen only in 34% and subglottic in 2% patients.

SUBSITE DISTRIBUTION OF SUPRAGLOTTIC CARCINOMA

Subsite involved	No. of cases	percentage
supraglottic epiglottis	03	16.12
Infrahyoid epiglottis	14	45.16
Aryepiglottic fold	26	83.87
Aretynoid	13	41.93
Ventricular bands	03	16.12
ventricular sinus	02	06.45

Aryepiglottic fold was the most common subsite involved(83.87%) in supraglottic carcinoma.nfrahyoid epiglottis was the 2nd most common subsite involved in supraglottic carcinoma. Arytenoids involvement was seen in 41,93% cases.

SUBSITE DISTRIBUTION OF GLOTTIC CANCER

Subsite involved	No. of cases	Percentage
Vocal cord	17	100
Anterior commisure	10	58.82
Posterior commisure	02	11.76
Supraglottic extension	03	17.64
Subglottic extension	02	11.76

Vocal cord involvement was present in all 17 cases of glottis carcinoma. Anterior commisure was the 2nd most common subsite involved in glottis carcinoma. Supraglotic extension seen in 17.64% patients. Posterior commisure involvement and subglottic extension was present in 11.76% cases each

CLINICAL STAGING AT THE TIME OF PRESENTATION

Stage	I	II	III	IV
No. of cases	5(10%)	7(14%)	18(36%)	20(40%)

Majority of the patients (76%) were in stage III and IV at the time of presentation.

HISTOPATHOLOGY REPORTS OF 50 CASES OF CA LARYNX

TYPE OF TUMOURS	No. of cases	Percentage
Squamous cell Carcinoma	48	96
Verrucous carcinoma	02	04
Total	50	100

96% patients were having squamous cell ca of varying degree of differenciation 4% patients were having verrucous carcinoma.

Conclusion

- CARCINOMA LARYNX occurs commonly in age group of 50-70 years .

- The disease is more prevalent in males as compared to females. Male to female ratio in the study is 5.25:1
- All the 50 patients included in the study were smokers.
- Hukka and cigarette were the most common mode of tobacco use. 84% of the patients were smoking since last 20 – 40 years.
- 56 % patients were alcoholic, though all the female patients were smokers none was alcoholic.
- Supraglottic carcinoma was the most common type of malignancy seen (62%) ,followed by glottic in 34% cases and subglottic in only 4%.
- Aryepiglottic was the most common subsite involved in the supraglottic carcinoma followed by infrahyoid epiglottis and aretynoid.
- Vocal cord involvement was seen in all the cases of glottic carcinoma. Anterior commissure was the second most common subsite involved in glottis type.
- 40% of patients had a stage IV disease while 36% patients were with stage III disease at the time of 1st presentation
- Squamous cell carcinoma was the most common type of lesion seen histologically.

REFERENCES

American Joint – Committee on Cancer : Manual for staging of cancer . 5 th edition Philadelphia Lippincott. Ravan 1998;177-186 .

Baliey BJH : Beyond the ‘ New ‘ TNM Classification Arch Otolaryngology Head and Neck Surg. 1990;117:369-370.

DeStefani E , Correa P , Oreggia F et al : Risk factors for Laryngeal cancers . Cancer 1987;60:3087-3091.

Goura K. Rath . Bidhu K . Mohanti : Text book of Radiation Oncology – Principles and Practice . 1st edition 2004.Page:162

Parkin DM , Pisani P ,Lopej AD , et al: At least one in seven cases of cancer is caused by smoking . global estimates for 1985 . Int J Cancer 1994;59:494-504.

Paymaster J. C . : Tata Memorial Hospital Report 1941 – 1957 Bombay , India. Tata Memorial Hospital 1959;34-38.

Raychowdhary R , Rashid H.A , Ghosh L. M : Topographical Distribution Of Laryngeal Carcinoma –A studyof fifty cases .Ind J Otolaryngology Head and Neck Surg 2002;54(4):291-294.

Sidransky . D :Molecular genetics of Head and Neck cancer ; Curr . Opin . Oncol. 1997;7:229-233.

Walkinson J . C ,Gaze M. W ,2 Wilson J. A . Stell and Maran’s Head and Neck Surgery . 4th Edition 2004 page no:233.

Whelan S , Parkin DM , Masuyer E ,Patterns of cancer in five continents , IARC ,Lycon , France , 1990.

Whelans S, Parkin DM : Patterns of cancer in five continents 1992 : Volume VI, IARC Scientific Publication No. 120 : Lycon.

****