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Original Article

Study on topographical distribution of carcinoma larynx

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Abstract:

Objectives: To find out the sites of involvement of carcinoma larynx.

Methods: A cross sectional study was carried out from January, 2006 to December, 2007 at the Department of ENT and Head-Neck Surgery of Dhaka Medical College Hospital, Dhaka. This study included 147 cases with of carcinoma larynx.

Results: Among 147 cases in this study near age was 54.53 years the pearl incidence was 6th to 7th decade; male: female rate 28.4: 1. Majority of case were related to cultivation (42.6%), came for rural area (66.7%), socioeconomic group (68%) and illiterate (49.7%). Regarding habit most of them were more than one habits (87.7%) patients were smokers, duration of smoking habit varied from 2 years to more than 40 years and per day consumption from 3-32 sticks. 100% of female had the, habit of betel leaf chewing in this study. The common symptom was hoarseness of voice (93.8%) followed by dysphagia (61.6%) respiratory distress (52.4%), earache (6.8%) cases, haemoptysis and neck pain in small proportion.

Indirect larygoscopic examination: Supraglottic carcinoma extension to one dial wall of pyriform fossa and valecular / bare of the tongue were present in (11.5%) and 8.7 cases respectively.

73.4% cases were more then one subsites involvement. Impaired vocal cord morbidity was found in 30.9% and fixed cord was 49.6%, 55.2% cases were airway inadequate, nodal involvement was 46.9%, 98.6% nodal involvement in supraglotic region, 65.2% were NI stage followed by N2 (21.7% and N3 (13%) distribution of the carcinoma larynx were supraglottic 74.10 glottic 25.10% and subglottic 0.70% more than one insite involvement were 88%, in supraglottic epiglottis 5.5%, any epiglottic folds 4.6% or glend 0.9% and ventricular bands were 0.9%. In the subsite of the glottic carcinoma glottic proper 37.8% followed by more then one insite (32.4%) anterior commissure 18.4% and posterior commissure 10.8%, 55% of the patient were Grade II and 49.6% were stage III.

Conclusion: Incidence of supraglottic carcinoma was more common, involvement of more than one single site also common.

Key words: *Carcinoma larynx, supraglottic.*

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Introduction:

The larynx is the most common site for primary malignant tumour in head and neck region.

International Union against cancer (UICC) and American joint committee (AJCC) on cancer in 1978 divides the larynx into 3 regions a) supraglottic b) Glottic and c) subglottic and carcinoma in supraglottic region is again sub divided according to site of origin, [1, 2] carcinoma of i) laryngeal surface of epiglottis, ii) aryepiglottic fold, iii) arytenoid iv) false cord and v) ventricle. Carcinoma in glottic region is subdivided according to its location, carcinoma of i) volcal cord ii) anterior commissure and iii) Posterior commissure. Carcinoma in subglottic region involves the area from the inferior border of the vocal cord to lower border of the cricoid cartilage including the areas caudal to the anterior and posterior commissure.[3, 4]

The American cancer society estimated approximately 12000 new cases of laryngeal cancer in USA in 1996.[5] A higher incidence of laryngeal cancer has been reported from Asian population. Study in our country also showed that the number of patients suffering from laryngeal carcinoma is increasing gradually, in a study in Dhaka Medical College Hospital, it was seen that 35.32% of all body cancers was in head and neck region and carcinoma of larynx was the commonest in head and neck region (31.58%).[6]

Attention must be paid to the accurate assessment of the location of the tumour because of the wide variation in the treatment planning and disparity of prognosis among the tumour involving different regions and even different subsites of the same region within larynx.[7] Although tumour of the same site may often have various biological potentials for malignancy, the site of laryngeal carcinoma is an important initial prognostic factor, because it comprises the possible way of extension of the primary tumour and modalities of metastasizing.[8]

The present study is done to outline the distribution of carcinoma of the larynx according to frequency in different anatomical regions & sites. The study results will provide us some knowledge to early diagnosis, treatment modalities and prognosis accordingly. The study will also help to find out the association of causative factors i.e. smoking, tobacco, betel-nut chewing, alcohol consumption etc. and carcinoma of larynx, because no single specific factor for laryngeal carcinoma has been cited.

Methods:

Methods of study: Patients were diagnosed as cases of laryngeal carcinoma by detailed history, general physical examination, and examination of neck, chest and abdomen. Then indirect laryngoscopic examination was performed in all cases and FOL in difficult cases for indirect, direct laryngoscopy and CT scan.

Histopathological examination was done for confirmation of malignancy and histological grading. Staging was done by grouping together of TNM features. Nodal status was determined by clinical examination. Stage I & II were marked as early stage. Stage III & IV were marked as advanced stage.

Results:

Table-I

Personal habits of study subjects (n=147).

Type of habit	No. of patients	Percentage (%)
Smoking	59	40.1
Chewing betel leaf with tobacco	15	10.2
Smoking & chewing betel leaf with tobacco	66	44.9
Smoking, tobacco chewing and alcohol	3	2.0
Smoking & alcohol	1	0.7
None	3	2.0
Total	147	100

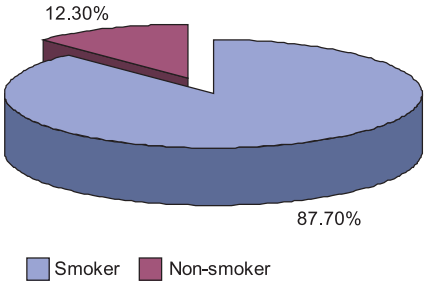

Figure-1: Percentage distribution of smokers among the study subjects.

Table-II

Duration of smoking habit (n=129)

Duration (in year)	Number of patients	Percentage (%)
1-5	4	3.1
5-10	13	10.1
10-15	16	12.4
15-20	21	16.3
20-25	27	20.9
25-30	31	24.0
30-35	7	5.4
35-40	8	6.2
> 40	2	1.6
Total	129	100

Table-III

Distribution of cigarette stick consumption per day (n=129)

No. of Sticks/day	Number of patients (n)	Percentage (%)
1-5	8	6.2
6-10	15	11.6
11-15	25	19.4
16-20	30	23.3
21-25	30	23.3
25-30	12	9.3
> 30	9	7.0
Total	129	100

Table-IV

Chewing betel leaf habit in study subjects (n=147)

Study subjects	Number of subject (n)	Chewing habit	Percentage (%)
Male	142	79	55.6
Female	5	5	100
Total	147	84	57.1

Table-V

Symptoms by site of carcinoma of the larynx (n=147)

Site/Symptom(s)	Supraglottic (%) n=109	Glottic (n=37)	Subglottic (n=1)	Total (n=147)
Change of voice	100 (91.7)	37 (100)	0	137 (93.8)
Dysphagia	84 (77.1)	6 (16.2)	0	90 (61.6)
Respiratory distress	58 (53.2)	18 (48.65)	1(100%)	77 (52.4)
Earache	8 (7.33)	2 (5.4)	0	10 (6.8)
Cough	3 (2.8)	0	0	3 (2.1)
Haemoptysis	2 (1.8)	0	0	2 (1.4)
Neck pain	3 (2.8)	2 (5.4)	0	5 (3.4)

Table-VI (a):
Respiratory distress which compelled to attend hospital

Site	Respiratory distress present	Respiratory distress absent	Total
Supraglottic	58	51	109
Glottic	18	19	37
Total	76	70	146

Table-VI (b)
Dysphagia which compelled to attend hospital

Site	Dysphagia present	Dysphagia absent	Total
Supraglottic	33	76	109
Glottic	1	36	6
Total	34	112	146

Table VI (c)
Hoarseness which compelled to attend hospital

Site	Hoarseness present	Hoarseness absent	Total
Supraglottic	17	92	109
Glottic	18	19	37
Total	35	111	146

Table-VII
Indirect laryngoscopic findings (n=139)

I/L findings/Site	Supraglottic (No.)	Glottic (No.)	Total No. & (%)
A. Nature of lesion-			
- Exophytic	83	16	99 (71.2)
- Ulcerative	21	19	40 (28.8)
B. One sub site involved	14	22	36 (25.9)
C. >One sub-site involved	90	12	102 (73.4)
D. Extended to pyriform fossa	12	-	12 (11.5)
E. Extended to valleula	9	-	9 (8.7)
F. Vocal cord mobility-			
Mobile	22	5	27 (19.4)
Impaired	29	14	43 (30.9)
Fixed	53	16	69 (49.6)
G. Airway inadequate	58	18	76 (55.2)

Table-VIII
Lymph node involvement according to site of carcinoma of larynx (n=69)

Site	Number of patients (n)	Percentage (%)
Supraglottic (109)	68	98.6
Glottic (37)	1	1.4
Subglottic (1)	0	0
Total (147)	69	100

Supraglottic: 109 (70.10%); Other than supraglottic: 38(25.90%)

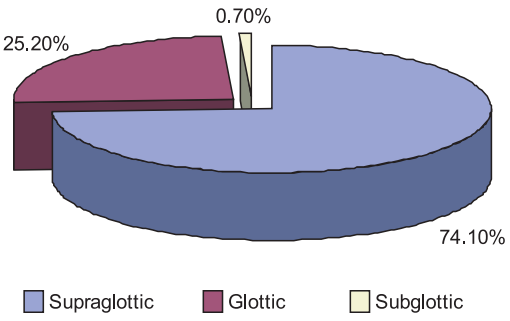

Figure-2: Percentage distribution of site of involvement of the larynx (n= 147)

Table-IX
Subsite involvement of supraglottic carcinoma (n=109)

Subsite involvemet	Number of subjects (n)	Percentage (%)
Epiglottis	6	5.5
Aryepiglottic folds	5	4.6
Arytenoids	1	0.9
Ventricular bands	1	0.9
Ventricular Cavities	0	0
More than one sub-site	96	88.0
Total	109	100.0

Table-X
Sub-site involvement of glottic carcinoma (n=37)

Sub-site involvement	Number of subjects (n)	Percentage (%)
Glottis proper	14	37.8
Anterior commissure	7	18.9
Posterior commissure	4	10.8
More than one sub-site	12	32.4
Total	37	100.0

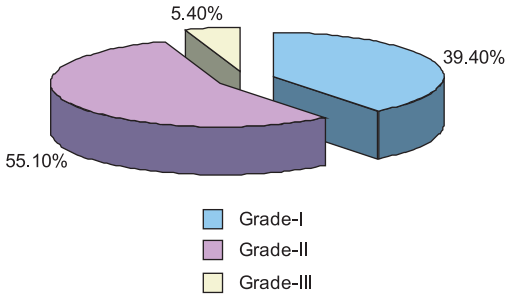

Figure-3: *Histological grading of carcinoma larynx (n=147)*

Discussion:

One hundred forty seven (147) subjects of squamous cell carcinoma of larynx were studied, which were selected from Department of ENT & Head-Neck Surgery, Dhaka Medical College Hospital, Dhaka. The age of study subjects ranged from 33 to 80 years, two previous study in Bangladesh also found similar distribution ,[9, 10] mean age were 54.53±11.52. Here the peak incidence of laryngeal carcinoma were at sixth (38.8%) and seventh (26.5%) decades respectively. Other studies also support that the peak incidence of laryngeal carcinoma is at the 6th or 7th decade.[11 - 14] In this study male 96.6%, female 3.4% and male female ratio were 28:4:1.[15, 16] There is significant association between male & occurring of laryngeal carcinoma (P<0.001).Most of the subjects came from rural areas (66.7%) and from a low socio economic status (68%), which is consistent with other studies.[16, 17] Majority of the subjects were related to cultivation (45.6%) in occupational analysis, which is consistent with the findings of another series.[16] Lack of health care facilities, have a synergistic effect along with smoking in development of carcinoma of larynx.[18]

Majority of the study subjects were smokers (87.7%), other personal habits were betel leaf chewing (55.1%) & chewing tobacco (57.1%) and alcohol consumption only (2.6%). In this series we found duration of smoking maximum in 15-30 years which was consistent with, where maximum duration of smoking was 20-30 years. There is significant association between smoking & laryngeal carcinoma (P<0.001).

In this study we have seen that chewing habit of betel leaves with other ingredient (shada, betel nut, lime, jarda etc.) indifferent combination of proportion is (55.1%), along proportion of study subject had chewing habit along with smoking (44.9%). So that there is a association of smoking and tobacco chewing habit with development of laryngeal carcinoma.[19]

In the context of our country development of supraglottic carcinoma may be related with poor nutrition with personal habit like, smoking and chewing habit of betel leaves with various ingredients, these chemical/physical ingredients are irritants to the mucous membrane of upper aero-digestive tract causing supraglottic carcinoma more common. [20, 21, 22]

In the Western countries cause of high incidence of glottic carcinoma is due to more consumption of alcohol. But due to Muslim country alcohol is prohibited in Bangladesh, for this reason there may be lower incidence of glottic carcinoma.

Majority of the patient attended in hospital during a time interval of 6 months or more

from the first appearance of symptoms (68.8%). It is too delayed in comparison with Western countries.[23] In this study observed out that delayed attendance of hospital was wrong treatment policy by homeopath (32.7%) or by quacks (30.6%), personal negligence/superstition (19.7%) and poverty (19.7%).

Most of the study subjects presented with more than one symptom, which were change of voice (93.8), difficulty in swallowing (61.6%), difficulty in respiration (52.4%) and others, almost similar observation was found by previous studies.[24]

In the glottic carcinoma, the commonest symptoms was the hoarseness of voice found in this series.(a) There is significant association between hoarseness of voice and glottic carcinoma (P<0.001). In previous study shows that change of voice was the common symptoms in case of glottic carcinoma but it was also leading symptoms in case of supraglottic carcinoma.

Difficulty in swallowing was common symptoms in this study which was more significant in supraglottic carcinoma (P<0.001) which is consistent with previous studies.[26]

The finding of indirect laryngoscopy was confirmed by direct laryngoscopic examination. We found incidence of supraglottic carcinoma (74.1%) was predominant over glottic carcinoma (25.2%) but only one patient was affected by subglottic carcinoma (0.7%). Similar observation was found in previous studies.[27] So occurrence of supraglottic carcinoma is more common and it is statistically highly significant (P<0.001).

Lymph node involvement was found in 69 (46.9%) patients. Among them most of the subjects were supraglottic carcinoma (98.6%) and only one was glottic carcinoma. The commonest stage of lymphadenopathy was N_1 (65.2%), relative frequency of N_2 and N_3 stage were (21.7%) and (13%) respectively among the cases of lymphadenopathies. Majority growth were exophytic (71.2%) and ulcerative lesion was less (28.8%) P< 0.001). Similar observation was made in by a study in Bangladesh.[28]

In supraglottic carcinoma of larynx, tumour stages at presentation were T_1 (13.8%), T_2 (35.8%), T_3 (48.7%) & T_4 (2.7%). This result is consistent with study performed in our country (Amin et al. 1991) but differs from studies in western countries. Glottic carcinoma T_1 (13.5%), T_2 (40.5%), T_3 (43.2%) & T_4 (2.8%)). This result also similar to other study, which was not significant with our series (P>0.05).[29]

In this study regarding staging of carcinoma of the larynx most of the patients present at advanced stage, mostly in stage III (49.6%), followed by stage II (32.6%), stage I (13.0%) and stage IV (4.8%). So that majority study subjects were squamous cell carcinoma stage III.

This observation is similar to the studies,[30] but differ with western studies.[31, 32] Staging is more important for better treatment modalities and prognostic value. From this study we have seen majority of carcinoma of larynx is found in advanced stage as they present late & more common in supraglottic.

Conclusion:

Incidence of supraglottic carcinoma is more common, involvement of more than one subsites also common. Hoarseness of voice is the commonest presenting symptom in laryngeal carcinoma.

Incidence is more in male, smoking is the commonest predisposing factor. Most of the cases present at an advanced stage. Extensive studies are required for better evaluation. Progressive intermittent

hoarseness of voice more than 15 days should evaluate by otolaryngologist.

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