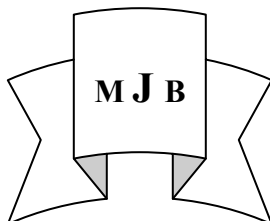


Studing the Relationship between 5'-Nucleotidase Activity and Body Mass Index in Obese Individuals

Sawsan Hassan Kadim
Babylon technical Institute, Hilla, Babylon, Iraq.



Abstract

In this study, 38 lean individuals (normal weight) and 27 obese individuals (over weight) were chosen randomly to show the activity of 5'- nucleotidase in the sera of those individuals.

Body mass index (BMI) was estimated to determine the lean and obese individuals. It was seen that the enzyme activity was increased in obese individuals particularly in those whose their BMI was higher than 30 kg/m². Also , it was found that enzyme activity also increased in the obese individuals whose their age group was above 50 years old.

دراسة العلاقة بين فعالية انزيم ٥-نيوكليوتايديز ومعامل كتلة الجسم في الاشخاص البدينين

الخلاصة

في هذه الدراسة ، خضع ٣٨ شخص نحيف (وزن طبيعي) و ٢٧ شخص بدين (وزن زائد) لدراسة مستوى انزيم ٥- نيوكليوتايديز في مصلهم . وقد تم تقدير معامل كتلة الجسم في جميع الاشخاص قيد الدراسة . وقد وجد ان هناك علاقة طردية بين معامل كتلة الجسم والزيادة في فعالية الانزيم خصوصا عند الاشخاص الذين لديهم معامل كتلة الجسم اعلى من ٣٠ كغم/م^٢ . كما اظهرت النتائج ان فعالية الانزيم تزداد مع تقدم العمر حيث لوحظ زيادة فعالية الانزيم في مصل الاشخاص الذين تجاوزت اعمارهم الخمسين عاما فما فوق .

Introduction

Obesity is a disorder of body weight regulatory systems characterized by an accumulation of excess of body fat. In primitive societies, in which daily life required a high level of physical activity and food was only available intermittently. The amount of body fat is difficult to measure directly , and is usually determined by an indirect measure - the body mass index (BMI) -

which has been shown to correlate with the amount of body fat in most individuals[1].

BMI gives a measure of relative weight, adjusted for height. This allows comparisons both within and between populations. The BMI is calculated in both men and women as follows:

$$BMI = (\text{weight in kg}) / (\text{height in meters})^2$$

The healthy range for the BMI is between 19.5 and 25.0 . Individuals with

a BMI between 25 and 29.9 are considered overweight, those whose BMI is equal to or greater than 30 are defined as obese [1].

5'-nucleotidases (5'- NT , (E.C. 3.1.3.5) catalyze the hydrolysis of the phosphoric ester bond of 5'-ribonucleotide to the corresponding ribonucleoside and phosphate [2]. In human sera there are seven types of 5'-nucleotidases (eN1, eN11, eN111, cdN and mdN) with different sub-cellular localization which have been cloned .

These enzymes (eN1, eN11, eN111) has been found in bacteria , animals , plants and human and they display significant differences in the range of substrates hydrolysed [3].

The main function of 5'-NT is the hydrolysis of AMP (Adenosine mono phosphate) to adenosine , so it is a part of the cascade to terminate the action of nucleotides such as ATP as extracellular signaling molecules [4].

Like other surface-located enzymes, 5'-NT , also known as CD₇₃, has been implicated in non-enzymatic function such as T-cell activation and cell-cell adhesion [5]. Besides, 5'-NT is believed to have a role in renal protection from ischemia and suggested treatment with soluble 5'-nucleotidase as a novel therapeutic approach in the treatment of renal diseases [6]. However, this enzyme may be elevated in some diseases or remain within normal. So, the aim of this study to show the levels of 5'-NT among obese individuals, and to compare that with normal individuals.

Materials and Methods

1- Subjects: 38 lean individuals(normal weight) and 27 obese individuals (over weight) were subjected in this study to show the level of 5'-NT in their sera.

2-Body mass index (BMI) was estimated by dividing the body weight in kilogram on the square of height in meters [7].

3-5'-nucleotidase was estimated according to the procedure mentioned by wood et al. [8], by using 5-AMP as substrate.

Results and Discussion

5-nucleotidase was estimated in all individuals under study .It was seen that the enzyme was higher than the normal in all obese individuals whose body mass index higher than 30 . This increase has not signification ($P > 0.05$) when compared with those individuals where BMI is below 25 (Table 1).

Table 1 Mean value of 5'-NT activity and BMI

BMI (kg / m ²)	Class	Number	Mean values of 5'-NT (U/L)
16- 20	Under weight	15	9 ± 3.2
21-25	Normal weight	٢٣	١٤ ± 4.2
26-30	Over weight	١٨	19.4 ± 3.6
31-35	Obese	٩	21.9 ± 2.2

* Normal value of 5'-NT was (2-17 U/L) [9].

Although the increase of 5'-NT is not significant as shown in Table 1 this increase may be due to an increase in some oxidative stress factors and also may be due to the increase in lipid Peroxidation[10].

Some authors have mentioned that the increase in this enzyme is seen in some obese individuals who are on levostatin treatment and who may have high

activity of 5'-NT . The effect of this drug could be supported by an inhibition of enzyme endocytosis through a decrease of Rho-GTpase isoprenylation[6,11]

The results also showed that this enzyme was insignificantly increased in elderly individuals (particularly in those above 50 years old) but this increase is not significant (P>0.05) as shown in Table (2).

Table 2 Relation between 5'-NT activity and age

Age	Number	Mean values of 5'-NT (U/L)
25 – 30	4	13.5 ± 2.1
31 – 35	12	15.4 ± 3.2
36 – 40	10	16.01 ± 3.0
41 – 45	14	16.7 ± 1.9
46 – 50	11	16.2 ± 2.2
51 – 55	9	18.7 ± 2.8
> 55	5	20.9 ± 1.8

* Normal values of 5'-NT was (2 – 17) U/L

The effect of age on enzyme activity may reflect the function of cells responsible for ecto-5'-NT ptoduction but this effect is not clear whether the effect is on extracellular or intracellular enzymes[4].

References

- 1-Harvey ,R. and champe , P: Biochemistry .(2005).3rd .ed Lippincott Williams and Wilkins .
- 2- Hunsucker ,S.Michell B.and Spychala J. (2005). Pharmacol Ther.107:1-30 .

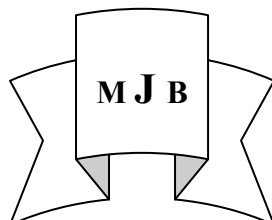
- 3- Strater,N.(2006) .P urin . Signal., 2: 343-350 .
- 4-Jackson,E.and Dubey, R.(2001). Am. J.Physiol Rena Physiol: 281:597-612.
- 5- Resta ,R.,Hoder, W.and Laurent, A.(1999) J.,Clin invest.99: 676-683.
- 6-Grenz,A.,Zhang,H.,Eckle,T.etal.(2007) .J.Am soc Nephrol., 18:833-843.
- 7- Human,W,Wrate R, Cowen S and Freeman C.(1995).Int. disorders ,18:91-97.
- 8-Wood,R.and Williams, D.(1981). Clin. chem.27:464-465.
- 9- Chakraborti,A.,Roycho,P.,Das,A.and Macherjes,M.1980. JBC.2:171-179.
- 10- Argani,H.,Amir,G.Nadera R .and Rhabnino, M. 2004.Lipidsin health and disease 3: 1-5 .
- 11- Furukawa ,S.,Fujita,T. and Michio .S.(2004).J.Clin.Invest. 114:1752 – 1761 .

Carcinoma of Larynx A Clinical Study

Sadiq Musa Ahmed Safa Noury Mohammad Ali*

Al-Sadder General Hospital Amarah-Missan, AlNajef, Iraq.

*Al-Hillah General Teaching Hospital Hillah, Babylon, Iraq.



Abstract

This thesis is a retrospective study of 270 patients with carcinoma of larynx admitted from January 2, 1991 to May 31, 1995 in E.N.T. - Head and Neck Surgery Center in Medical City in Baghdad. The age ranging between 5th – 8th decades with peak incidence in the 7th decade in males and 6th decade in females.

77.4% were males and 23.4% were females and male: Female ratio was 3.3:1. The majority of the patients presented with hoarseness. Supraglottic carcinoma was the commonest region.

The incidence of lymph node metastases was 23.5% and it was highest in transglottic carcinoma followed by supraglottic carcinoma.

Stage T1N0M0 was more common than other stages and radiotherapy was the mainstay of treatment of our patients.

الخلاصة

البحث عبارة عن دراسة استرجاعية لبحث ٢٧٠ مريض يعانون من سرطان الحنجرة ادخلوا الى شعبة جراحة الانف والاذن والحنجرة في مدينة الطب في بغداد ما بين الفترة من ٢ كانون الثاني ١٩٩١ الى ٣١ حزيران ١٩٩٥.

اعمار المرضى تراوح بين العقد الخامس والعقد الثامن (اعتمدت نسبة كانت العقد السابع للرجال والسادس للنساء). (٧٧,٤%) من الرجال و (٢٣,٤%) من النساء وكانت نسبة الرجال الى النساء (٣,٣:١)

اغلب المرضى كانت الشكوى لديهم هي بحة الصوت واكثر المناطق في الحنجرة تضررت بالمرض هي المنطقة العليا من الحنجرة. وجود غدد لمفاوية متضخمة في الرقبة بسبب انتشار المرض عن طريق اللمف هو (٢٣,٥%) وهو اكثر لدى المرضى المصابين بالورم الذي يعم كل اجزاء الحنجرة متبوعا باورام اعلى الحنجرة.

اغلب المرضى كانوا ضمن التصنيف T1N0M0 وكان العلاج الاشعاعي هو الوسيلة الاساسية في العلاج.

Introduction

Laryngeal cancer is common in Iraq [1]. It constitutes 5.8% of the cases recorded by the Iraqi Cancer Registry 1989- 1991, it ranked the 5th commonest cancer in Iraq, and it was the third commonest cancer in males and the tenth commonest cancer in females [2].

In United States it constitutes 1.2 percent of all cancers and it is estimated that that about 12,000 new cases are diagnosed annually, and almost 4,000 patients die every year [3].

Laryngeal cancer has a high rate of cure, therefore, places upon the clinician a much greater responsibility than usual, for careful evaluation and treatment bring a probability of cure while, in common with number of other head and neck neoplasms, failure may be followed by relatively uncomfortable and unsavory death [4].

The aims of the study

The aims of the study are to clarify the following points about carcinoma of the larynx:

Clinical presentation.

The commonest region.

(3) Incidence of lymph node metastases.

(4) Stages and the modalities of treatment.

Patients and Methods

A retrospective study of patients who were diagnosed in E.N.T. Head and Neck Center in Medical City, as having carcinoma of the larynx from January 2, 1991 to May 31, 1995.

Most of the patients who came to our centre were referred cases from different areas of Iraq.

They were analyzed with respect to their age, sex, chief complaints, region of the tumor, lymph node metastases and histopathology of the tumor. The

diagnosis was according to the clinical E.N.T. examination and direct laryngoscopy done under general anesthesia and using rigid laryngoscopes to determine the site, extent of the tumors , for biopsy taking and examine for cord mobility .

The types of the tumors and their degrees of differentiation were obtained from histopathological reports.

The stage of the disease was based on the clinical findings utilizing the UICC-TNM classifications of carcinoma of larynx, 1978.

Results

Results which were collected in tables and figures have been made by using pie histograms.

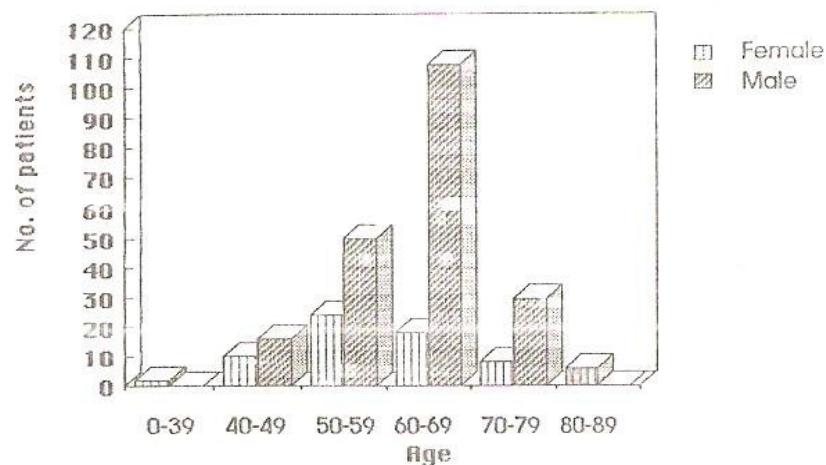


Figure 1: Age distribution

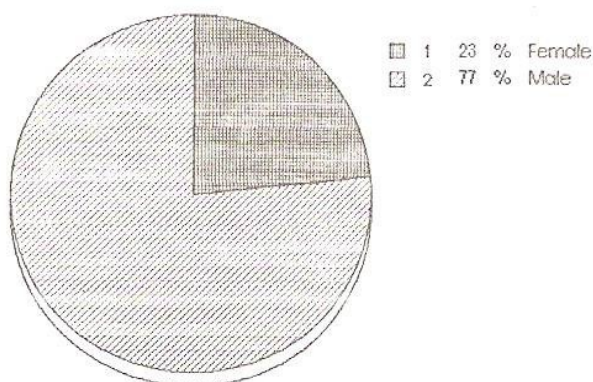


Figure 2 Sex distribution

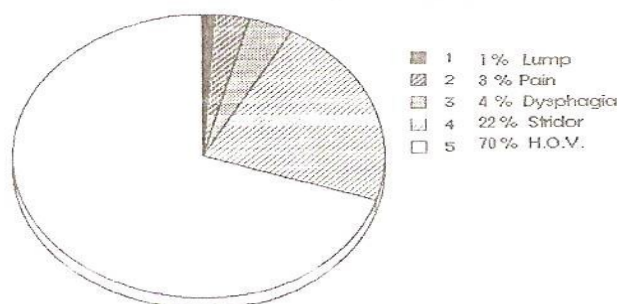


Figure3 Chief complaint

Table 1 The chief complaint according to the region.

Region	Hoarseness		stridor		Dysphasia		pain		Lump	
	No.	%	No.	%	No.	%	No.	%	No.	%
Supraglottic	95	70	23	17	10	7	5	4	3	2
Glottic subglottic	79	70	33	30	=	=	=	=	=	=
Transglottic	1	25	2	50	=	=	1	25	=	=
	14	84	2	8	=	=	2	8	=	=
Total	189	70	60	22	10	4	8	3	3	1

Table 2: The duration of the chief complaints according to the region of the cancer.

Duration	Supraglottic		glottic		subglottic		transglottic		total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Less than 2m	16	12	28	25	=	=	1	9	45	17
2 – 6 months	35	26	65	58	=	=	6	36	69	39
More than 6m.	85	62	19	17	4	100	11	55	165	44

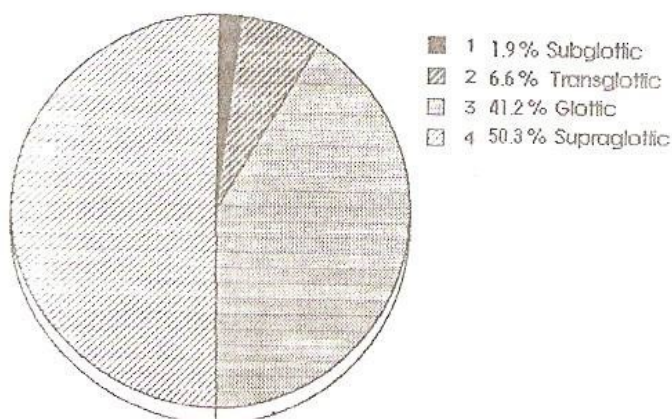


Figure 4 Region of the tumor

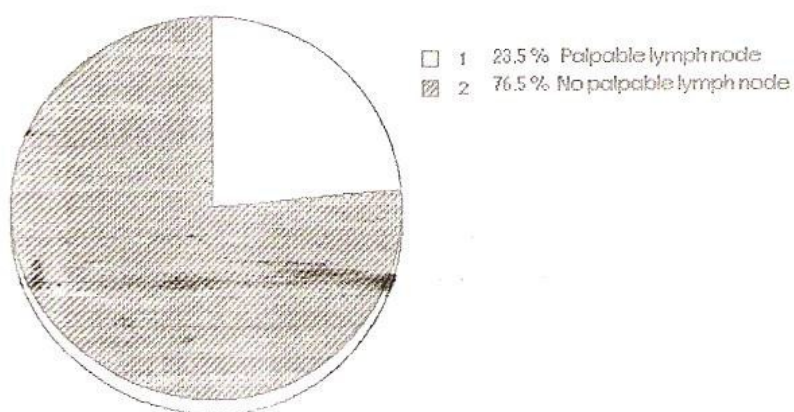


Figure 5 Nodal Status:

Table 3 Shows the percentages of palpable lymph nodes according to the Region of carcinoma.

Region	No		N1		N2		N3		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
Supraglottic	93	68	24	18	10	8	8	6	42	32
Glottic	102	94	5	5	=	=	1	1	6	6
subglottic	4	80	1	20	=	=	=	=	1	20
Transglottic	14	64	4	18	2	9	2	9	8	36
total	213	76.5	34	15	12	4	11	4.5	5.7	23.5

Table 4 Shows relation of T stage with lymph node.

T stage	NO		N1 – N3	
	No.	%	No.	%
T1	90	89	11	11
T2	33	82.5	7	17.5
T3	69	74.2	24	25.8
T4	21	59	15	41

Table 5 Stages and their managements.

Stage	No.	%	Radiation	Total Laryngectomy	Radiotherapy and surgery	Chemotherapy and Radiotherapy
T1NO MO	90	33	83	5	-----	2
T2NO MO	33	12.2	20	10	3	-----
T3NO MO	69	25.5	54	11	4	-----
T4NO MO	21	7.7	17	1	3	-----
T1N1 MO	7	2.5	7	—	-----	-----
T1N3 MO	4	1.4	4	—	-----	-----
T2N1 MO	7	2.5	5	1 Total laryngectomy and radical neck dissection	-----	1
T3N1 MO	10	3.7	8	2 total laryngectomy and radical neck dissection	-----	-----
T3N2 MO	8	2.9	8	-----	-----	-----
T3N3 MO	6	2.2	6	-----	-----	-----
T4N1 MO	5	1.8	4	-----	-----	1
T4N2 MO	5	1.8	5	-----	-----	-----
T4N3 MO	5	1.8	5	-----	-----	-----

Discussion

Chief complaints and duration:

In our study, the most common presenting symptoms were hoarseness of voice (70%) and stridor (22%). Less common symptoms include dysphagia (4%), Pain (3%) and lump (1%). The majority of the patients with glottic, supraglottic and transglottic cancers complained of hoarseness, whereas those with subglottic cancers stridor were the commonest presenting symptom. Saad S. Tahir et al reported that the most common presenting features were hoarseness of voice (86.4%), stridor (27%), odynophagia (16.2%) and earache (5.4%) [1].

"MEREDITH 1987" reported that hoarseness was the predominant presenting symptom at all sites [5].

With regard to the duration of symptoms, 17% of the patients had symptoms for less than 2 months, 39% had symptoms for 2 to 6 months, and 44% had symptoms for over 6 months. 56% of the patients had symptoms for 6 months or less. 83% of patients with glottic cancers had symptoms for 6 months or less, while 62% of patients with supraglottic cancers had symptoms for more than 6 months and this may be due to the majority of our patients who were of low educational class, so they delayed in consulting the otolaryngologist or may be due to misdiagnosis by general practitioners and because of supraglottic cancers which comprised (50%) of our patients are delayed in their presentation.

"Jason 1989" reported that 49% of the patients had symptoms for less than 2 months, 45% had symptoms for 2-6 months, and 5% had symptoms for more than 6 months [6].

Region of tumor:

Our study showed that the supraglottic region more affected than other regions and it comprised about

50.3%, the glottic was 41.2%, subglottic 1.9% and transglottic was 6.6%.

Many studies reported higher incidence of supraglottic involvement. "Al-Mansouri, A. 1990" reported 51.6% supraglottic, 25.8% glottic, 4.9% subglottic, 9.7% transglottic and 8% epiglottis [7].

"SAAD S. TAHIR et al" reported 39.2% presented with glottic, 59.5% with supraglottic and 1.3% with subglottic [1]. However, in many studies the glottic region has been found to be involved more than others.

"Jason D. Eiband et al 1989" reported 51% were glottic, 42% supraglottic, 6% transglottic and 1% subglottic [6].

"Meredith 1987" reported 51% of tumors involve glottic region, 39% involve supraglottic, and 10% involve the subglottic [5].

Lymph node involvement:

In our study we found that 23.5% of the patient with laryngeal cancer had lymph node metastases at the time of referral and the lymph node metastases was highest in transglottic carcinoma followed by supraglottic carcinoma 32%, whilst 20% in subglottic carcinoma and 6% in glottic carcinoma and the incidence of palpable lymph nodes increases with the extent of the primary tumor.

"Som 1970" reported the high incidence of lymph node metastases for supraglottic carcinoma 32% [8].

"P.M. Stell and A.G.D Maran 1978" reported 35% lymph node metastases for supraglottic carcinoma, 30% for transglottic carcinoma, 20% for supraglottic carcinoma and rare for glottic carcinoma [9].

"Jason D. Eiband et al 1989" reported lymph node metastases were noted 24% of the patients with supraglottic tumors and in 12% of those with glottic tumors [6].

" B. Morra et al 1987 " reported that a significant increase of clinically suspected node in supraglottic tumors was found while no significant relationship was demonstrated between the extension of the neoplasia and nodal involvement [10].

The incidence of palpable lymph nodes increases with the extent of the primary tumor [4].

Stage and treatment

TINOMO STAGE was the most common stage which comprised 33%, followed by stage T3NOMO which comprised 25.5%. Mainstay of treatment of our patients was radiotherapy and it's indicated for stage I and stage II and total laryngectomy with or without radical neck dissection reserved for patients with failure of radiation and for stage III and stage IV. Chemotherapy was indicated as an adjuvant therapy. But the management of our patients influenced by the choice of the patients because some patients refuse surgery when it was indicated or they prefer surgical treatment.

Tracheostomies were done in 150 patients (55.6%) as emergency tracheostomies for stridorous patients or as elective tracheostomies prior to direct laryngoscopy when tumor interfered with endotracheal intubations. Advances in radiotherapy have made it possible to cure a high percentage of the early glottic tumors (T1 or T2) without sacrificing the voice [11]. Controversy exists, however, regarding the initial treatment of the more advanced stages. Although total laryngectomy with or without neck dissection offers a higher cure rate in the advanced glottic carcinomas than radiotherapy. It is argued that patients pay a heavy price for this increment in cure rate in terms of loss of the voice and a permanent tracheostomy [12]. Proponents of laryngectomy feel that a curative with radiotherapy makes little sense in advanced disease with cord fixation,

since the probability for requiring subsequent surgery is so high that only a few patients are likely to benefit by preservation of the larynx [13].

Radiotherapists, on the other hand, strongly favour radiotherapy, with salvage surgery only for persisting or recurring disease. By so doing, they believe they can save some larynges with cure rates comparable with patients initially treated by laryngectomy [14].

Conclusion

The majority of the patients with laryngeal cancer are presented with hoarseness.

Supraglottic carcinoma is more common than others.

The incidence of lymph node metastases was 23.5% and it was highest in transglottic carcinoma followed by supraglottic carcinoma.

Stage TINOMO is more common than other stages and radiotherapy is the mainstay of treatment of our patients.

References

1. Saad S. Tahir, Muzhir Al- Doury, Mohammed A. Al- Hashimi, Sadeq F. Al - Bayati. Radiotherapy for laryngeal cancer. Iraqi Medical Journal 1991: 41: 112 – 117.
2. Iraqi cancer Board. Results of Iraqi Cancer Registry 1989 – 1991. Baghdad, Ministry of Health of Iraq, 1993:18-20.
3. Ferlito A. Histological classification of larynx and hypopharynx cancers and their clinical implications. Acta otolaryngol 1976: 342: 1-37.
4. Michael Glesson : Malignant Alan G. Kerr . Salivary gland tumors. In: Scott – Brown's otolaryngology, sixth edition, vol.5. London, Butterworth and Heinemann, 1997: 5/11/9.
5. Meredith A.P.DE et al. Advanced Laryngeal cancer: A management perspective. Journal of Laryngology and otology 1987: 101: 1046 – 1054.
6. Jason D. Eiband et al. Prognostic factors in squamous cell carcinoma of

the larynx. The American Journal of surgery 1989: 158: 314 – 317.

7. Al - Mansouri A. Incidence of carcinoma of larynx. Iraqi Med. Journal 1990: 2: 36 – 40.

8. Som M.L. Conservation surgery for carcinoma of the supraglottis. Journal of laryngology and otology 1970: 84: 655 – 678.

9. Stell P. M. Dalby J.E., Singh S.D., Ramadan M.F. and Bainton R... The management of glottic T3 carcinoma. Clinical otolaryngology 1982: 7: 175 – 180.

10. Morra B. et al. Relationship between cervical nodal metastases and laryngeal

cancer. Journal of laryngology and otology 1987:101:1168-1174.

11. Marks RD Jr, Fitz - Hughes GS, Cox-Stable WC. Fourteen years experience with cobalt - 60 radiation therapy in treatment of early cancer of true vocal cords. Cancer 1971: 28: 571 - 6.

12. Pradhan SA et al. Radical radiotherapy and salvage surgery for T3NOMO glottic cancer: is feasible in Indian population? Indian J. Cancer 1985: 22: 29- 32.

13. De Santo L.W., Lillie JC, Devine KD. Surgical Salvage after radiation for laryngeal cancer. Laryngoscope 1976: 86: 649 - 57.