Original Research Article

Study on locoregional response with combined modality using conventional dose radiation therapy and concurrent single agent cispatin chemotherapy in locally advanced hypopharyngeal and laryngeal squamous cell carcinomas

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Abstract

Background: In the Indian situation, as of now, there can only be two ways of controlling malignancies. One is by way of primary prevention and the other being managing the advanced disease. Thus, comparatively newer modalities of concurrent chemoradiation particularly with cisplatinum are producing high locoregional control.

Aim: To describe the loco-regional response with combined modality treatment using conventional dose radiation therapy and concurrent single agent cisplatin chemotherapy in locally advanced hypopharyngeal and laryngeal squamous cell carcinomas, to describe the toxicity profile and feasibility of treatment regimen with combined modality chemo-radiation therapy, to describe the success with organ preservation in locally advanced hypopharyngeal and laryngeal cancers using combined modality chemo- radiation therapy.

Materials and methods: Total number of patients available for analysis was 26. All the patients were assessed for immediate response and for acute local and systemic toxicities. The end points of the study included. The initial tumor response - immediately on completion of treatment and at 6 weeks,

Acute local and systemic toxicity due to concurrent chemotherapy and radiation therapy, Organ preservation.

Results: Concurrent chemoradiation using conventional dose radiation therapy (6600 CGy) and single agent CDDP given on days 1, 22, 43 as studied in this cross sectional study achieves significant local control rates and organ preservation goals. The toxicities seen in this combined modality regimens appeared to be tolerable. Study showed with statistical significance, that the T stage and stage of a disease affects response at local and regional node sites respectively.

Conclusion: Concurrent chemoradiation using conventional dose radiation therapy (6600 CGy) and single agent CDDP given on days 1, 22, 43 as studied in this cross sectional study achieves significant local control rates and organ preservation goals.

Key words

Squamous cell carcinomas, Chemotherapy, Head and neck tumors.

Introduction

Head and neck cancers comprise a heterogeneous group of lesions. It has a complex anatomy of four major sites and seventeen subsites. Each bears its unique set of epidemiologic, pathologic and treatment consideration.

At the Barnard Institute of Radiology and Oncology, head and neck cancers constituted about 689 of 2361 cancer cases registered in 2004. This represented about 29% of the total number of cases. The incidence of head and neck cancers is significantly higher in males (M:F=3 to 4:1), more than 80% of these patients present with Stage III and IV disease, and most of them are operable.

Substantial alcohol intake and cigarette smoking in males, and tobacco chewing in Indian females are major risk factors. Alcohol augments the effect of smoking by increasing the absorption of carcinogens contained within the cigarette smoke.

Tobacco smoke contains more than 3500 chemicals, of which more than 20 are carcinogens. Specific chemicals include N-Nitroamines, aromatic amine, ethylene oxide and agents that cause oxygen free radical damage. An increased frequency of P-53 tumor suppressor gene mutation has been reported in smokers with Head and Neck cancers, especially in conjunction with alcohol consumption. A dose response relation exists between the number of cigarettes smoked per day and cancer of head and neck. Tobacco use is responsible for more than 90% of tumors of oral cavity cancers among men and 60% among women. A variety of other heritable environmental occupational and hygiene factors are of lesser importance.

Squamous cell carcinoma constitutes at least 95% of head and neck cancers except those in the hard palate and salivary glands. Muco-epidermoid carcinoma, adenocarcinoma, sarcoma, melanoma, plasmacytoma and lymphoma are infrequently seen. Squamous cell carcinoma can be categorized into three classic differentiations.

I. Well differentiated carcinoma shows greater than 75% keratinization.
II. Moderately differentiated carcinoma shows 25-75% keratinizations and
III. Poorly differentiated carcinoma constitutes less than 25% keratinization.

Patients with squamous cell carcinoma of head and neck region respond well to standard treatment, namely surgery and/or radiation therapy when diagnosed in the early stage. Unfortunately in India more than 2/3rdof these case are locoregionally advanced and unresectable at presentation. Hence, there is a definite call to make use of a combined modality

approach. Radiation therapy and chemotherapy in different combinations achieve good lecoregional loco control thereby improving the survival, organ preservation and quality of life the achievement of local control in this disease with initial definitive treatment with radiation therapy with or without chemotherapy is an important treatment strategy for overall survival.

Radiation therapy oncology group (RTOG) has explored various combinations of treatment aimed at improving the results in these advanced tumors

- Pre-operative radiation therapy followed by surgery.
- Initial surgery followed by post-operative radiation therapy.
- Neo adjuvant chemotherapy followed by radiation therapy.
- Sequential chemotherapy and radiation therapy.
- Concurrent chemotherapy and radiation therapy.

Materials and methods

Patient selection criteria

- Previously untreated patients with a proven histology. Squamous cell carcinoma of the head and neck region were included for this study.
- The primary sites were hypopharynx and larynx.
- For selection UICC / AJCC - 2002 TNM staging was followed.
- All patients were stage III and Stage IVA without any bony involvements.
- Histology - only squamous cell carcinoma.
- Patients considered eligible were those with age less than 60 years and Performance status > 70 KPS.
- Blood Parameters: Hb>10gm / dl and above, Platelet > 1.5 lakhs and above, Total count 4500 cells / mm^3 and above, Blood urea: 20-40 mg%, Serum creatinine: 0.6 -1.2 mg%, Creatine clearance 90- 130 ml / 24 hr

Exclusion Criteria

- Any previous treatment for cancers
- Age: More than 60 years
- Performance status < 70 / KPS
- Stage I, II and IVB, IVC, IVA with bone involvement
- Associated medical disease like hypertension, diabetes mellitus, and tuberculosis.
- General Condition - HB%: <10 gm, Platelets: < 1.5 lakh / mm^3, Total count: < 4500 cells / mm^3, Blood urea:> 40 mg%, Serum creatinine:1.2 mg%, Histology other than squamous cell carcinoma

Patient history

- Detailed present history of the patient regarding the disease.
- Any past illness: Tuberculosis, Hypertension, Diabetes Mellitus, H/o Surgery, previous H/o Cancer, Syphilis, Ischemic Heart Disease.
- Habits: Smoking, No. of Cigarette / Beedi / day, No. of years of smoking, Tobacco and betel nut: No. of times tobacco used per day, Alcohol: Regular or occasional, Consumer of alcohol, Pan Chewing: No. of times / day and No. of years used.

Local Examination

Oral hygiene: Dental carries tooth, dentures, oral occluded, illfitting tooth.

Tongue: Fissures and Glossites, Hard and soft palate.

Preparation of Patient before treatment planning

- All the patients were persuaded to quit smoking and alcohol.
- All the patients were subjected to dental examination by a dentist regarding dental extraction of loose and caries tooth.
- Patients were instructed to maintain good oral hygiene.

- Renal parameters, auditory study on and neurological status were assessed.

Patient informed consent

Patients were informed about the study. The objective of the study was explained to them and they were educated about the complications that they were likely to encounter. All the patients underwent treatment as in-patients.

Treatment Protocol

All the patients enrolled in this study were subjected to the following treatment protocol.

Concurrent Chemotherapy

- Patients were pre-hydrated with one litre of intravenous fluids the day before to starting chemotherapy.
- On the day of administration of chemotherapy patients were hydrated with 1 litre of IV fluid.
- Injection cisplatin 100mg / m^2 was administered in 200 ml of normal saline over 30 minutes.
- Injection ondansetron 8 mg and injection dexamethasone 8 mg were used as antiemetics and were administered 20 minutes before chemotherapy.
- Injection 20% mannitol 175 ml IV was infused 2 hour after administration of CDDP.
- Post - chemo hydration: 1 litre IV fluid over 2 - 3 hrs. This schedule was given on Day 1, Day 22, and day 43.

Radiotherapy

A total planned dose of 66 Gy in 200 CGy daily fraction was delivered to the selected treatment fields. Radiation was given 5 days a week. Iradiation was performed using a Cobalt 60 phoenix theratron machine at 80 cm SSD.

Treatment Portals

Opposing laterals were used. Target volume included the primary lesion with clearance for microscopic disease and included the draining lymph node. Dose was calculated at Mid plane for all cases using opposing laterals.

Verification

All patients were planned in treatment position and were simulated and the treatment portals were verified, corrections were made when necessary.

The treatment was delivered in 3 phases

I phase: Entire target volume received 44 Gy

II phase:

- Field was shifted off the spinal card
- N_0 cases -> whole neck was treated up to 50 Gy
- N + Cases -> whole neck was treated up to 60 Gy

III Phase

In N_0 cases primary area was treated up to 66 Gy. Ni cases primary and nodal region were treated up to 66Gy

Patients were examined weekly during chemo RT for assessing toxicity that resulted from treatment. Attention was paid to the airway patency and the maintenance of an adequate oral intake. Chemotherapy dosage modification was not permitted. Weekly hemogram, renal parameters were assessed carefully.

After completing the full courses chemotherapy and radiation therapy patients were analysed clinically for primary tumor and nodal regression. Indirect laryngoscopy was done to assess the response, immediately and after **6** weeks of treatment. CT Scan was taken to assess the response at 6 weeks.

Response Parameters

- A complete response was defined as the complete disappearance of all clinical and radiographic evidence of disease.
- Partial response was defined as any response less than complete, but more than 50% reduction of measurable disease.
- Static Response defined as any response with tumor shrinkage <50% but no progression.
- Progressive disease was defined as a greater than 25% increase in the initial size or as the appearance new lesions or metastatic disease.

- Local control was defined as the achievement of disease free period of at least 3 months after obtaining a complete response.

Separate evaluations were carried out for the primary tamor and the palpable nodes.
The end points of the study included.

- The initial tumor response - immediately on completion of treatment and at 6 weeks.
- Acute local and systemic toxicity due to concurrent chemotherapy and radiation therapy.
- Organ preservation.

Follow up

First follow up: At 6 weeks, for response assessment
Review : Every 1 month during the first year.
Proposed follow up:
Every 2 months - 2nd year
Every 3 months - 3 rdyear
Every 6 months - 4th year and 5th year
Every year - from 6th year.

Results

The study period was from March 2004 - March 2005. Total number of patients included in the study was 30. 4 patients discontinued treatment. Total number of patients available for analysis was 26. All the patients were assessed for immediate response and for acute local and systemic toxicities.

Mean age of patients was 51.69 years with range from 34-60 years. Out of all patients, 84.6% were male and 15.4% were female. Karnofsky performance status was as per **Table – 1**.

Table – 1: Karnofsky performance status.

Score	No. of Patients	Percentage (%)
90	10	38.5
80	14	53.8
70	2	7.7
Total	**26**	**100**

All except 2 patients gave a history of tobacco use in one form or other, while 12 patients gave history of alcohol use (**Table – 2**). Patient distribution according to primary site was as per **Table – 3**.

Histology

All the patients had histologically proven squamous cell carcinoma. Distribution of patients according to different grades was as per **Table – 4**. Patient distribution according to UICC staging was as per **Table – 5**.

Table – 2: Prevalence of Habits.

Habits	No of Patients	%
No Habits	2	7.7
Smoking alone	9	34.6
Smoking + Alcohol	10	38.5
Alcohol	2	7.7
Tobacco alone	3	11.5
Total	**26**	**100**

Table – 3: Patient distribution according to primary site.

Primary Site	No. of Patients	%
Pyriform Fossa	13	50%
Post Cricoid region	1	3.8
Pharyngeal wall	2	7.7
Glottis	4	15.4
Supraglottis	6	23.1
Total	**26**	**100**

Table – 4: Distribution of patients according to different grades.

Differentiation Grade	No. of Patients	%
Well Differentiated	8	30.8
Moderately differentiated	14	53.8
Poorly differentiated	4	15.4
Total	**26**	**100**

Initial Tumor Response

We included 30 patients in our study. Out of these 26 patients were eligible for analysis. Males constituted 22 patients and females 4 patients (**Table – 6**).

Analysis by Gender

Out of 22 male patient 16 patients had complete response and 6 patients partial response i.e. 72.7% of male patient had complete response and 27.3% male patients had partial response (P=0.02).

Table – 5: Patient distribution according to UICC staging.

N Stage	T Stage			Total No, of Patients
	T2	T3	T4	
No	--	2 (7.7%)	—	2 (7.7%)
N1	1 (3.8%)	7 (26.9%)	1 (3.8%)	9 (34.6%)
N2a	3(11.5%)	—	—	—
N2b	2 (7.7%)	3(11.5%)	—	5 (19.2%)
N2c	3(11.5%)	5 (19.2%)	2 (7.7%)	10(38.5%)
Total	**6(23.1%)**	**17 (65.4%)**	**3 (11.5)**	**26 (100%)**

Table – 6: Initial tumor response.

Patient	Total Patients	CR	PR	Static	Overall Response
Male	22	16(72.7%)	6 (27.3%)	—	100% (22)
Female	4	3 (75%)	1 (25%)	—	100% (4)

Table – 7: Response by Histological Grade.

Grade	No. of Patients	CR	PR	Static
Well differentiated	8	8(100%)	—	—
Moderately differentiated	14	13 (92.9%)	1 (7.1%)	—
Poorly differentiated	4	2 (50%)	2 (50%)	—

Table – 8: Analysis according to site.

Primary site	Total Patients	CR	PR	Static
Pyriform Fossa	13	12(92.3%)	1 (7.7%)	--
Postcricoid Region	1	1 (100%)		
Posterior Pharygeat wall	2	1 (50%)	1 (50%)	--
Glottis	4	4 (100%)	--	--
Supraglottis	6	5 (83.3%)	1 (16.7%)	
Total	**26**	**23/26 (88.5%)**	**3/26 (11.5%)**	--

Of the 4 female patients, 3 patients had complete response while 1 patient had partial response i.e. 75% of females patient had complete responses 25% of female patients had partial response.

When patients were analyzed according to histological grade, well-differentiated carcinoma constituted 8 cases and the 8 patients had complete response. Moderately differentiated carcinoma constituted 14 cases, of these 13 patients had complete response [i.e. (92.9%) of cases] and one patient had partial response (i.e. (7.1%) of cases] Poorly differentiated carcinomas constituted 4 cases, of these 2 cases had complete response (i.e. 50% of cases) and 2 cases had partial response (i.e. 50% of cases) as per **Table - 7**.

Patients had pyriform fossa lesion. Out of these 12 patients (92.3%) had complete response and one patient had (7.7%) partial response. One patient in post curcoid region showed complete response. Out of two patients having posterior pharyngeal wall tumor, one patient showed

complete response (50%) and 1 patient showed partial response (50%) as per **Table – 8**.

4 patients had glottic lesion, all the 4 patients had complete response (100%). 6 patients had supraglottic lesion of which these 5 patients had complete response (83.3%) and one had partial response (16.7%).

Response by T Stage

Six patients had T2 disease. All the 6 (100%) patients had complete response. 17 patients had T3 disease. All the 17 patients had T3 disease. All the 17 patients had complete response (100%). Three patients had T4 disease. All the 3 patients had partial response (**Table – 9**).

Table – 9: Response by T Stage.

T Stage	CR	PR	Static
T_2	6/6 (100%)	—	
T_3	17/17(100%)	—	—
T_4	0/3	3/3 (100%)	—
Total	**23/26 (88.5%)**	**3/26 (11.5%)**	

(p = 0.000)

Table – 10: Response by Nodal Stage.

Nodal Status	CR	PR	Static
N,	9/9(100%)	--	
N_2a	—	—	—
N_2b	5/5 (100%)	—	
N_2c	4/10(40%)	6/10(60%)	—
Total	**20/26 (76.9%)**	**6/216 (23.1%)**	

(p = 0.006)

When we analyzed according to nodal stage, 9 patients were in **N** group. All the 9 (100%) patients had complete response. 5 patients were in **N_2b** category. All the 5 patients (100%) had complete response, 10 patients were in N_2c category. Out of these 4 patients (40%) had complete response while 6 patients (60%) had partial response. Thus overall 20 patients (76.9%) had complete response and 6 patients (23.1%) had partial response (**Table – 10**).

One patient had T2N1 disease, showed complete response two patient was in T2N2b stage, all the patient had complete response. Three patient was in T2N2c disease, Only 1 patient showed complete response (33.3%). The remaining 2 patient showed partial response (66.6%). Two patient had T3N0 stage, both patient showed complete response (**Table – 11**).

Seven patients were in T3N1 stage, all the seven patients had complete response.

Table – 11: Analysis according to Stage Grouping.

Stage Grouping	CR	PR
T_2N,	1/1 (100%)	
T_2N_2b	2/2(100%)	
T_2N_2c	1/3 (33.3%)	2/3 (66.6%)
T_3N0	2/2(100%)	
T_3N,	7/7(100%)	
T_3N_2b	3/3 (100%)	
T_3N_2c	2/5 (40%)	3/5 (60%)
T4N1	0	1/1 (100%)
T4N2C	0	2/2(100%)

Three patients were in T3N2b stage, all the three patients had complete response. Five patients had T3N2c stage out of these only two patients showed complete response (40%), three patients

had partial response (60%) one patient was in T4N1 stage showed only partial response. Two patient had T4N2c, both patient had partial response.

Out of the 26 patients 18 patients had complete response (69.2%) and 18 patients had partial response (30.8%) as per **Table - 12**.

Table – 12: Final analysis of response.

Particulars	**No. of Patients**	**%**
Total number of patients	26	100%
Complete response	18	69.2%
Partial response	8	30.8%

Stage wise twelve patients were in stage III disease, all the 12 patients showed complete response.

14 patients were in stage IVA disease, out of which only six patients had complete response, and 8 patients had partial response. This shows concurrent chemo radiation shows higher locoregional control rate in stage III disease.

Acute local and systemic toxicity

Local Reactions

Almost all patients had either one or more toxicities. Mucositis was the lost common toxicity observed in our study diagnosed by scopy examination, lucositis was graded according to RTOG criteria (**Table – 13**).

Table – 13: RTOG criteria.

Grade	**Definition**	**No. of Patients**
Grade	No reaction	--
Grade I	Erythema	--
Grade II	Patchy mucosities	10 (38.4%)
Grade III	Confluent mucosities	16(61.6%)
Grade lV	Ulceration	—

Out of the 26 patients 10 patients developed Grade II mucositis and 16 patients developed Grade III mucositis. Grade IV was not reported in any patients.

Patients were instructed to gargle with 2% soda bicarbonate solution 4-5 times a day. In between, patients were instructed to gargle with plain water frequently in order to reduce oral microbial flora. Inj. Placentrex was given I from the second week onwards on alternate days and daily from third week.

Two patients had oral thrush treated with Clotrimazole mouth paint.

Skin Reactions

Skin reactions were the second most common complication encountered in our study. Skin reactions were graded according to RTOG Criteria (**Table – 14**).

Analysis of Skin reaction

About 3 patients only had Grade II skin reactions, Hyperpigmentation was seen in all 26 patients. 23 (8%A6%) patients had Grade I reaction.

Systemic toxicities

Weight loss

All the patients had weight loss. 21 patients had grade I weight loss. Five patients had grade II weight loss (**Table – 15**).

All the 26 patients were given nutritive diet. Eleven patients required Kyle's tube feeding. Patients having pyriform fossa postcricoid tumors had Kyle's tube feeding from the beginning. At the end of treatment, they were able to take feeds orally. None required feeding gastrostomy.

All 26 patients complained of nausea, either Grade I or Grade II. Fifteen patients had vomiting (Grade I or II). However, only few patients required parenteral support because of nausea or vomiting. They were managed with additional dose of Inj. Ondensetron with Dexamethasone (**Table – 16**).

All the twenty six patients showed a decrease in haemoglobin levels. Four of them had Grade II

decrease and were n fresh whole blood transfusion with compatible group. They also had aie I in platelet, WBC and neutrophil levels (**Table – 17, 18, 19, 20**).

Table – 14: RTOG criteria.

Skin	**Grade 0**	**Grade I**	**Grade II**	**Grade III**	**Grade IV**
	No change over base line	Follicular faint erythema epilation dry desquamation reduced sweating	Tender bright erythema patchy moist desquamation moderate edema	Confluent moist desquamation other than skin fold pitting edema	Ulceration haemorrhage necrosis
No. of Patients	--	23/26	3/26	--	--
percentage	--	88.46	11.34		--

Table – 15: Weight Loss.

Weight loss	**Grade I**	**Grade II**	**Grade III**	**Grade IV**
Percentage	5-9.9	10-19.9	>20	—
Patients	21/26 (80.8 %)	5/26 (19.2%)	--	—

Table – 16: Nausea and Vomiting.

Nausea	**Grade I**	**Grade II**	**Grade III**	**Grade IV**
	Reduced but reasonable intake	Intake significantly decreased but still can eat	No significant intake	--
Patients	10/26 (38.5%)	10/26 (38.5%)	6/26 (23%)	--
Vomiting	**Grade I**	**Grade II**	**Grade III**	**Grade IV**
	One episode in24hr	2-5 episodes in24hr	6-10 episodes in 24 hr	> 10 episodes in 24 hr, or requires parenteral support
Patients	15/26	9/27	2/26	--
	(57.7%)	(34.6%)	(7.7%)	

Table – 17: Hemoglobin.

Hemoglobin	**Grade I**	**Grade II**	**Grade III**	**Grade IV**
g/dl	10-N	8-10	6.5-7.9	<6.5
Patients	22/26 (846%)	4/26 (15.4%)	—	—

Table – 18: Platelets.

1 Platelets	**Grade I**	**Grade II**	**Grade III**	**Grade IV**
Per μL	150,000-75,000	< 75,000-50,000	< 50,000-25,000	< 25,000
Patients	6/26 (23%)	--		--

Table – 19: WBC.

	Grade I	**Grade II**	**Grade III**	**Grade IV**
μL	3000-4000	2000-3000	1000-2000	<1000
Patients	6/26(23%)	--	--	--

Table – 20: Neutrophils.

Neutrophils	**Grade I**	**Grade II**	**Grade III**	**Grade IV**
Per μL	1500-2000	1000- 1500	500-1000	<500
Patients	6/26 (23%)	--	--	--

Sepsis

Sepsis was noted in six patients. Mixed flora of microbial agents were i in their culture report. They were treated with Inj. Cefatoxime 1 g IV bid 5-7 days.

Renal parameters were routinely checked every week out of the 26 Patients only 2 patients shows mild elevation blood urea, serum creatimine.

Ototoxicity and anaphylactic reactions were not observed in any patient.

Discussion

Surgery is the oldest treatment for cancer and until recently was the only treatment that could cure patients with cancer. The development of alternate treatment strategies that can control microscopic disease has prompted to reassess the magnitude of surgery necessary.

The introduction of chemotherapy in the 5th and 6th has resulted in the development of curative therapeutic interventions patients with several type of cancers. The important obstacles encountered in the use of chemotherapy have been the toxicity to the normal tissues.

Progress in radiation oncology was initially linked to technological developments in the planning and delivery of precise treatment, but the past 20 years has witnessed the application of biological concepts defined from experimental work in radiation biology [1].

The major clinical application of the principles of radiation biology has n in the design and testing of novel fractionation strategies for radiation therapy.

It is obvious that the goal of any treatment approach should be the latest probability of uncomplicated cure. Although it is desirable, circumstances actually may direct a different policy. But the worst complication of treatment is tumor recurrence.

Literature showed about 40-60% of death in head and week caners are due to locoregional failure. Concomitant chemo radio therapy isprimarily aimed at overcoming mechanisms of radiation resisted at the leoregional tumor site.

The possible mechanism of chemoradiation is that they have activity against different tumor cell sub population. Cells with intrinsic resistance against one treatment modality may be sensitive to the other [2, 3].

The early eradication of such resistant cells by the second treatment modality may prevent their subsequent proliferation which otherwise would lead to a larger number of therapy resistant cells. This mechanism implies an additive interaction of the two modalities at the loco regional level no divert cellular interaction [4].

Steel G.G and Peckham M.J. et al., have proposed three additional mechanisms of interaction between the two modalities. These include spatial co-operation, toxicity independence, and radiation protection [5].

In our study Injection Cisplatinum on day 1, 22, 43, of the radiation treatment period was given concomittantly with External beam radiation, 6600 cgy/200cgy per # 5 / week to a total of 33# in 6-3 weeks.

Our study was based on the RTOG 81-17 protocol, and inter group Phase-Ill study concomitant chemotherapy and radiotherapy in advanced mucosal. Squamous cell carcinoma of the Head and Neck [6].

Our Barnard Institute of Radiology and Oncology is consider to be an apex centre, in the Public Sector, rendering recent less service for cancer patients of South India. At this Premier Institute, a total number of 24, 415 new cancer cases have been registered over the last 10 years. Among them head and neck cancers draw a lion's share of 8131 cases. The average number of new cases per year in our Institute is 2500. The head and neck cancers are 827 (29.2%) cases per year. More than 60% of these patients present with advanced stages (Stage III and IV) [5, 6].

In our study, there were 30 evaluate patients, 26 were males and 4 females. 4 male patients discontinued treatment. The mean age was 51.69 years ranging from 34 years 60 years. All patients in our study had a performance status of above 70 KPS.

Out of the 26 patients 24 patients had history of smoking, alcohol intake and tobacco chewing in different combinations. We observed a complete response rate of 69.2 (18 Patients) and Partial response rate of 30.7 (8 patients) with an overall response rate of 69.2 Static response was not seen in any patients [4].

Out of the 26 patients, 10 patients were in Stage III disease, 16 patients with stage IV a disease. In the subset analysis the following were the primary tumor sites: Pyriform fossa - 13, Post cricoid - 1, Pharyngeal wall - 2, Glottis - 4, Supraglottis – 6.

In the response analysis by tumor stage T_2 (6 patients) showed complete response, T_3 (17 patients) show complete response. Only in T_4 (3 patients) all the patients showed only partial response (P = 0.009) [7, 8].

The T_2 stage with Node presentation group (6 patients) 5 patients showed could cafe response (83.3%) only one patient showed partial response (16.7%).

In T_3 stage with nodal presentation (17 patients) 14 patients showed complete response (8 patients) 3 patients showed partial response (17-6%).

In T_4a stage with nodal presentation out of the 3 patients only one patient showed complete response (33.3%) 2 patients showed partial response (66.7%).

Toxicities

Treatment related toxicity most commonly include Grade-1 weight loss which was experience by 21 out of 26 patients and mild skin reaction in 23 out of 26 patients.

Weight loss was due to a combination of factors including loss of taste, anorereia, nausea vomiting and anorexia. Intravenous fluid replacement in elected patients could often reverse anorexia and enhance a sense of well-being during the rest day [9].

Mucositis was diagnosed by IDL scopy examination, was really troublesome factor that we came across during the treatment.

- Grade 1 mucositis was observed in 9 patients (34.65) Grade II / III mucositis in 17 patients (65.3%)
- No patient developed grade IV mucositis.
- Regarding skin reactions, we observed grade I skin reaction is 23 patients (88.5%) and grade II skin reactions in 3 patients (11.3%).

- Most patients and experienced grade II and grade II Nausea.

Most patients experienced grade I and grade II vomiting - due to chemo therapy, but were well controlled by anti-emetics and I.V. fluids.

Only two patients reported with mild elevation of renal parameters. No tit developed life threatening CDDP induced acute renal failure [10].

Grade I myelo suppression was observed in only 4 patients (15.3%). The overall response rate in our study was 69.2% which is comparable the institutional studies.

Conclusion

In the Indian situation, as of now, there can only be two ways of controlling malignancies. One is by way of primary prevention and the other being managing the advanced disease. Thus, comparatively newer modalities of concurrent chemoradiation particularly with cisplatinum are producing high locoregional control.

Concurrent chemoradiation using conventional dose radiation therapy (6600 CGy) and single agent CDDP given on days 1, 22, 43 as studied in this cross sectional study achieves significant local control rates and organ preservation goals.

The toxicities seen in this combined modality regimens appear to be tolerable.

This study also shows, with statistical significance, that the T stage and stage of a disease affects response at local and regional node sites respectively.

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