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A Study on Prescribing Pattern of Chemotherapy in Head and Neck Cancer



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ABSTRACT

Introduction: Head and neck cancers are the most common cancers in developing countries, especially in Southeast Asia. Head and neck cancers are more common in males compared to females. This is mainly attributed to tobacco, areca nut, alcohol, etc. Oral cavity cancer was most common among all Head and Neck Squamous Cell Carcinoma. **Objectives:** Evaluation of the Treatment Approach and Prescribing Pattern of Chemotherapy in Head and Neck Cancer. **Methodology:** This was a Prospective and Observational study was performed on 108 Head and Neck Cancer patients. This study included inclusion and exclusion criteria, this study was assessed and evaluated by suitable statistical method. **Results:** Among the 108 patients included in the study, 65.7% male & 34.3% were female. Oral cavity Cancer (34) was the most diagnosed type of cancer. With multiple treatment approaches, Chemotherapy was commonly used. Cisplatin was the most prescribed chemotherapeutic agent with 94.3% recovery. Among 91 patients treated with surgery 83.51% recovery was seen and Wide Local Excision was the highest performed procedure. Among different doses of radiation, 66gys was the most prescribed dose of Radiation and had 71.42% recovery. **Conclusion:** The treatment for Head and Neck Cancer is often determined by a multidisciplinary team. Cisplatin is most commonly used chemotherapeutic agent because Cisplatin has high patient compliance and can be administered along with other therapies like radiation and surgery without any complication along with efficacy. Wide local Excision helps in overall patient compliance and reduces the chance of recurrence.



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INTRODUCTION

Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells. When a cell has become cancerous, it does not respond to the normal processes that regulate cell growth, proliferation and survival, and they cannot carry out the normal cell physiological functions¹. Cancer may be either benign or malignant type, malignant cancers are more life threatening and can spread to other organs of the body. Cancer affects the lifestyle of an individual and worsens the quality of life of an individual.

Head and neck cancer (HNC) is a type of cancer that affects the upper aerodigestive tracts like oral cavity, sinonasal tract, larynx, pyriform sinus, pharynx, and esophagus. Head and neck cancer is a malignant tumor and can affect the normal function of adjacent organ or even spread to close or distance organs, though some head and neck cancer are benign in nature. Head and neck cancer develop from thin, flat cells called squamous cells, which are in the epithelium, the innermost layer lining these structures. As Head and neck cancer starts in this layer of cells they are also called Head and Neck Squamous Cell Carcinoma (HNSCC).

Head and neck cancer is more common in males than in females, with smoking and chewing tobacco as the major cause. Alcohol and some infectious disease like human papillomavirus, Epstein-bar virus are also a key factor in the origin of head and neck cancer worldwide. In Asian population smokeless tobacco, betel nuts, are also etiological agent responsible for HNC². Head and neck cancer are associated with pain in the affected area, swelling or sores that does not heal, red or white patch in the mouth, lumps in the area, persistence sore throats, foul mouth odor and other different signs and symptoms which are experienced differently.

Worldwide, head and neck cancer accounts for more than 650,000 cases and 330,000 deaths annually³. In the United States, head and neck cancer accounts for 3 percent of malignancies, with approximately 53,000 Americans developing head and neck cancer annually and 10,800 dying from the disease⁴. In Europe, there were approximately 250,000 cases (an estimated 4 percent of the cancer incidence) and 63,500 deaths in 2012. HNSCC is the sixth leading cancer by incidence worldwide⁵. While head and neck cancers form one of the most common cancers in South and Southeast Asian countries, they form only 1%–4% of all malignancies in the Western world⁶. Oral cancers are predominant forms of head and neck squamous cell cancer (HNSCC) in India, Pakistan, and other Southeast Asian countries.

The overall prevalence of HNSCC due to HPV is around 50%⁷, with the highest prevalence in cancers of the tonsil and base of tongue⁸. The HPV prevalence in India ranges from 33.6% in the Eastern region to 67% in South India and 15% in Western India^{9, 10}.

Anticancer drugs were mostly prescribed in combination. This finding is consistent with the existing utilization pattern of anticancer drugs. Among combination chemotherapeutic regimens, 5-FU and platinum based combinations were commonly prescribed. Numerous experimental and clinical studies have revealed pronounced antitumor activity of cisplatin and 5-FU in various types of head and neck cancer.

Chemotherapy is especially required in advanced stages (III/IV) of head and neck cancers. Cisplatin and continuous infusion of 5-FU have been established as the standard induction regimen for such advanced cases with response rates of 20-50%. Docetaxel has proven to be an effective agent with response rate of 21-42% when used alone in patients with locally advanced, recurrent, and/or metastatic disease. Addition of Taxane to 5-FU and platinum based regimens has also been observed¹¹.

Head and neck cancer diagnoses were associated with significantly greater odds of opioid prescription. Data suggest that patients with HNCA have a higher prevalence of pain than patients with other cancer types, which may explain a necessity for more intensive pain management regimens¹². There is an urgent need for further quantification and understanding of post procedural and chronic opioid use in this patient population.

The purpose of head and neck cancer treatment, as in other neoplasms, is to obtain locoregional control and thereby improve survival. Owing to the anatomical regions involved in this pathology, its treatment has an important impact on patient quality of life in aspects such as ventilation, swallowing, and phonation and the quality of life is therefore of key importance in the therapeutic algorithm. Therapeutic goals in head and neck cancer are as follows: (a) To prevent lesions resulting from procedures intended to aid the patient, (b) to offer efficacious services based on scientific knowledge and avoid therapeutic options without proven benefit, (c) to offer individualized treatment that respects and answers to the patient's preferences, needs, and values, (d) to offer opportune care, reducing waiting time and harmful delays, (e) to increase services' efficacy by optimizing the teams, supplies, ideas, and energy, and (f) to offer equitable care without personal, gender, ethnicity, geography, or socioeconomic characteristics having any influence¹³.

With regard to therapeutics, it is important to specify that, at early clinical stages, single treatment either with surgery or radiotherapy (RT) is the cornerstone, and that in locally advanced disease, multidisciplinary treatment is necessary, and that surgeons, medical oncologists, and radiotherapists are therefore the professionals responsible for tumor control. In patients undergoing surgery, chemotherapy (CT) associated with RT in the adjuvant setting is indicated when there are adverse prognostic factors in the surgical specimen such as resection margins or adjacent in-involvement, multiple lymph node metastases or when there is lymph node extracapsular dissemination. Concomitant chemoradiotherapy (CTRRT), preceded or not by induction CT (ICT), is indicated at locoregionally advanced stages or organ preservation intent, mainly the larynx. In patients with recurrent and/or metastatic carcinoma, CT and best supportive approach are the main options, although local treatments, such as irradiation and rescue surgery, are also considered depending on the case. The treatment of locally advanced and recurrent and/or metastatic carcinomas has evolved, and important efforts have been made to further improve the outcomes, especially with the addition of new biologics such as those targeting the epidermal growth factor receptor for the management of locally advanced, recurrent, or metastatic disease in concomitance with RT or CT¹⁴.

Multidisciplinary Management (MDM) is the backbone of high-quality management in the treatment of cancer in general and head and neck cancer in particular. MDM groups are working teams comprised by different health specialists who gather relatively frequently and regularly to prospectively and individually (one by one) analyze together clinical cases to formulate recommendations on the best clinical management. The objective of MDM is to ensure that all patients benefit from a team of specialists able to share their experience, knowledge, and personal insight. Studies showed that specialist physicians focus their attention mainly on body structures (88%), their functions (76%), and environmental factors (21%); however, several functioning aspects related to daily life activities and socioemotional aspects are not addressed by medical oncologists and must be opportunely treated by other health professionals, members of the MDM team¹⁵.

The treatments of head and neck cancers are usually done in either surgically, radiation and/or chemotherapy. The use of these treatment modality help in controlling the tumor, especially in the metastatic stage, the treatment is sometimes combined with immunotherapy to archive increase in the patient quality of life¹⁶.

Immunotherapy also called biologic therapy, is designed to boost the body's natural defenses to fight cancer. It uses materials made either by the body or in a laboratory to improve, target, or restore immune system function. Pembrolizumab (Keytruda) and nivolumab (Opdivo) are major immunotherapy drugs approved by the U.S. Food and Drug Administration (FDA) for the treatment of people with recurrent or metastatic head and neck squamous cell carcinoma (HNSCC) that has not been stopped by platinum-based chemotherapy (see below for information in metastatic cancer and recurrent cancer). Both are immune checkpoint inhibitors that are also approved for the treatment of some people with advanced lung cancer or melanoma.

The increasing number of head and neck cancer patient is alarming with the involvement in the treatment of head and neck cancer, the decision of the type of treatment approach to be done for better patient life quality, highly lies on the multidisciplinary team to deliver. Therefore the evaluation of the different treatment approach for head and neck cancer for better quality of life of patient becomes a priority.

This study is focused on the evaluation on the management of different head and neck cancers, which helps in reviewing the major three approaches like, chemotherapy, surgery and radiotherapy to the treatment of head and neck cancers for effective approach for better survival or quality of life.

METHODOLOGY:

Study site:

The study was conducted in the Head and Neck Oncology Department of Apollo Multi Specialty Hospital & Research Center, Bengaluru.

Study design:

This was a Prospective and Observational study and was performed on 108 patients to assess prescription pattern of Chemotherapy in Head and Neck Cancer patients.

Sample size:

A total of 108 patients from the Head and Neck Oncology department of Apollo Multi Specialty Hospital & Research Center, who satisfied the study criteria and consented to participate in this study were included for the study.

Study period:

The study was conducted over a period of 6 months starting from September 2018 to February 2019.

Ethical approval:

Ethical committee clearance has been obtained by the institutional ethical committee of Apollo Multi Specialty Hospital & Research Center.

Study criteria:

Inclusion Criteria:

- Patients diagnosed with any type of Head and Neck cancer
- Patients prescribed with chemotherapy and other multidisciplinary treatment approaches
- Patients treated in daycare as well as inpatients
- Patients belonging to all age group

Exclusion criteria:

- Pregnant and lactating women
- Patients who have no record of Head and Neck Cancer.

Source of data:

Patient demographics, clinical findings and therapeutic data were collected from inpatients and the main sources for the collection of data were;

- Patient's case notes

- Treatment chart/Medication chart
- Patient discharge cards

Study procedure:

1. Patient Enrollment:

Patients diagnosed with different types of Head and Neck Cancer and admitted in Head and Neck Oncology department of the Apollo Multi Specialty Hospital in Bengaluru during the study period, for different treatment approaches, were selected and screened based on the inclusion and exclusion criteria. Patients who met the inclusion and exclusion criteria were enrolled for the study.

2. Methods of data collection:

All patients admitted to the Head and Neck Oncology department of the Apollo Multi Specialty Hospital in Bengaluru- during the study period- were screened for the prescription pattern of chemotherapy in Head and Neck Cancer Patients. Those who met the inclusion and exclusion criteria were enrolled for the study. Follow ups were carried from day of admission to the day of discharge of the enrolled patients. After the diagnosis was confirmed by the physician, the relevant & necessary baseline information such as the socio-demographic details of the patient & details on the visit for the treatment was obtained from patient case notes and even the patient age, gender, date of admission etc. was also collected. Therapeutic data such as the name of the drugs, doses, route of administration, duration, and other data's are collected in a suitably designed data collection form.

3. Determination of prescribing pattern of Chemotherapy:

All patients admitted with Head and Neck Cancer during the study period in the Head and Neck Oncology department were studied to determine the prescription pattern of chemotherapy prospectively. Once the diagnosis was confirmed along with different patient characteristics and diagnostic imaging studies prescription pattern of chemotherapy was also evaluated. To determine the prescription pattern, therapeutic data from patient's case file is evaluated. Prescription were collected from patients diagnosed with Head and Neck Cancer and these prescription were analyzed for chemotherapeutic agents prescribed and evaluated for the choice of drugs given, class, type of therapy i.e., monotherapy/dual therapy, dose

frequency and duration of therapy. Chemotherapeutic agents used were grouped into classes like Alkylating agents, Monoclonal Antibodies, Taxanes etc. Monotherapy was defined as a prescription for one agent or two within the same drug class. Dual therapy is defined as prescription for one or more agents belonging to different classes.

4. Assessment and Evaluation of Multidisciplinary approach:

After the treatment approach was confirmed the patient's diagnostic parameters such as imaging studies, Histopathological tests was evaluated to draw the current condition of the patient. Once the treatment approach was completed the patient is reevaluated for the patient's condition after therapy using the same diagnostic parameters. Both the results are then compared to assess and evaluate the multidisciplinary treatment approach. Imaging studies include CT scan, PET, MRI and Ultrasound. Imaging studies measures the size of tumor and helps in diagnosis and evaluation of treatment outcome. Histopathological studies collect a tissue sample of affected area and analyze for metastasis and nodal involvement.

Statistical methods:

This method was descriptive statistics, frequency and percentage was drawn and charts were used to represent the consolidated data for inferential statistics. Chi-square test of independent of attribution were used to test the categorized data.

Significant figures:

1. Suggestive significant (p value: $0.005 < p < 0.10$)
2. Moderately significant (p value: $0.01 < p \leq 0.05$)
3. Strongly significant (p value: $p \leq 0.01$)

Statistical software:

This statistical software namely SPSS version 23.0 used for the analysis of the data and as drawn charts and graph etc.

RESULTS:

Figure No. 01: Gender wise distribution of the sample population:

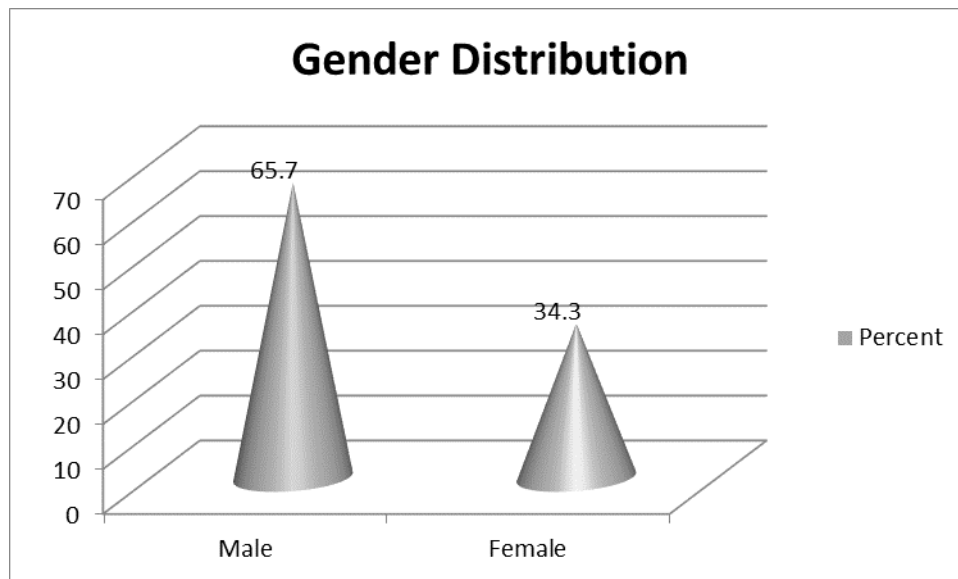


Figure No 01 shows that total participation of male and female patients out of the 108 patients, 71 are male and 37 are female patients giving percentage of 65.7% and 34.3% respectively.

Table No. 01: Age wise distribution of the sample population:

Age Group	Frequency	Percentage
20-30 Years	11	10.2
30-40 Years	11	10.2
40-50 Years	18	16.7
50-60 Years	29	26.9
60-70 Years	25	23.1
70-80 Years	9	8.3
80 and Above	5	4.6
Total	108	100.0

Table No 01 shows distribution of participants in different age groups that were selected for the study. Out of 108 total patients the maximum distribution was seen in the age group of 50-60 years, which showed a total of 29 (26.85%) patients, and the least distribution was seen in the age group of 80 years and above, which had a total of 5 (4.6%) patients.

Figure No. 02: Distribution of sample according to social history:

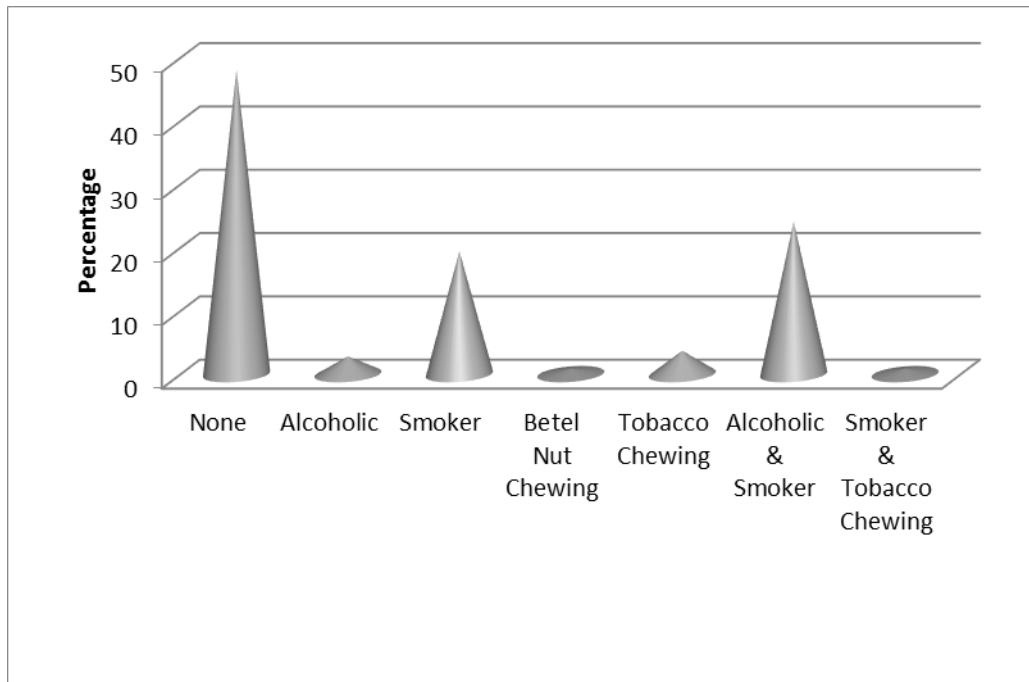


Figure No 02 show sample distribution according to their social history. Out of the total 108 patients 48.1% patients had no history of smoking or alcoholism. 24.1% of patients had smoking as well as alcoholism, 19.4% of patients were smokers.

Figure No. 03: Distribution of data according to age and gender group:

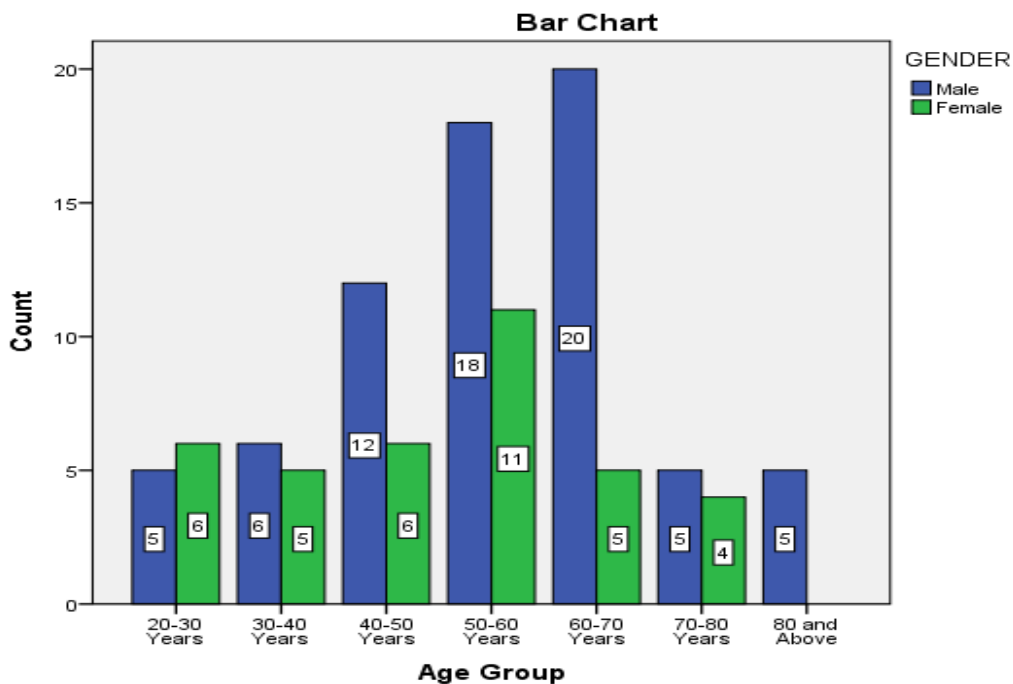


Figure No 03 show distribution of sample population according to age group and gender. The maximum numbers of participants seen were male participants 71(65.7%) out of 108 total population. Maximum participation was seen in the age group of 60-70 years with 20 patients in males and 50-60 years with 11 patients in females.

Table No. 2: Distribution of sample according to Final Diagnosis and Gender:

Final Diagnosis	Male	Female
CA Thyroid	4	9
CA Larynx	21	1
CA Hypopharynx	5	1
CA Oral Cavity	21	13
CA Oropharynx	3	1
CA Parapharynx	0	2
CA Nasopharynx	1	2
CA Parotid Gland	5	3
CA Supraglottis	1	0
CA Pyriform Fossa	3	0
CA Pyriform Sinus	1	0
CA Vocal cord	2	0
Posterior Cricoid Growth	0	2
CA Right Temporal Bone	1	0
CA Nasal Cavity	1	0
Basal Cell Carcinoma	1	0
CA of neck	1	0
Tumor on Right Pinna	0	1
Glomus Tympanicum	0	1
Malignant Melanoma Of Maxillae	0	1
Total	108	

*CA = Carcinoma

Figure No. 04: Distribution of sample according to Final Diagnosis and Gender:

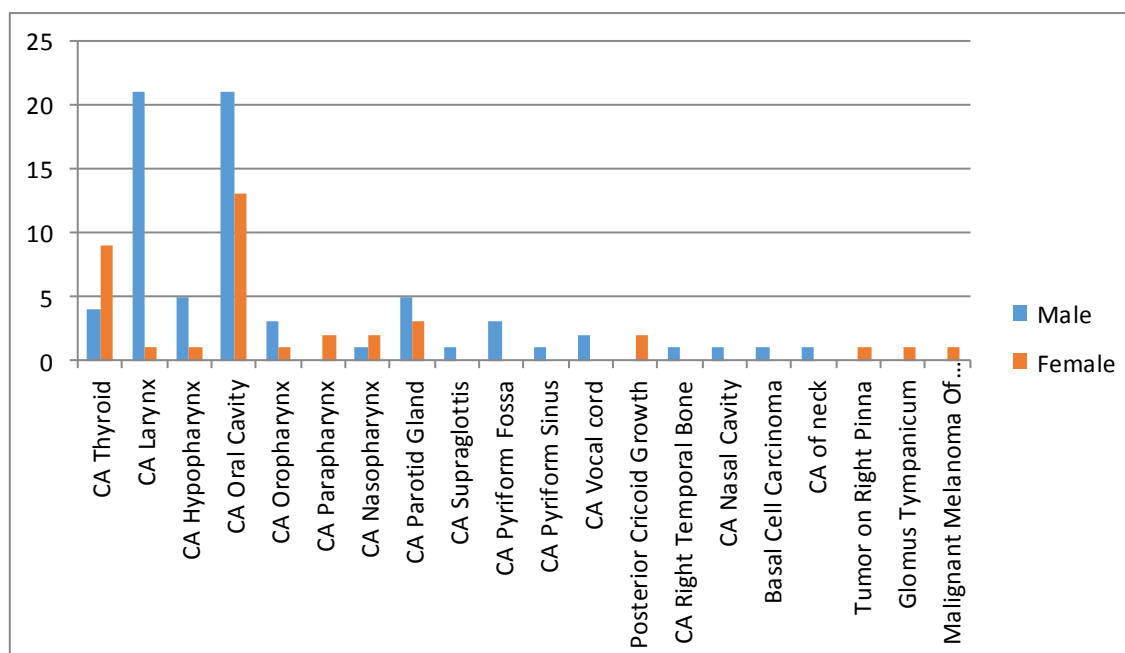


Table No 02 and Figure No 04 shows distribution of patients according to their final diagnosis and gender. Oral cavity cancer was the most common type of cancer seen among patients. 21 male patients and 13 female patients were diagnosed with Oral Cavity Cancer. The second common type of cancer was Carcinoma of Larynx which was seen in 21 male and 1 female patients.

Table No. 03: Chemotherapy patient distribution based on Gender:

Chemotherapy	Gender		Total
	Male	Female	
Surgery / Radiation	40	25	65
Carboplatin	2	2	4
Cetuximab	1	0	1
Cisplatin	11	2	13
Carboplatin + Paclitaxel	4	3	7
Carboplatin + Paclitaxel +Cetuximab	1	0	1
Carboplatin + RT	1	2	3
Cetuximab + RT	2	1	3
Cisplatin + Paclitaxel	0	1	1
Cisplatin + RT	6	0	6
Cisplatin + Paclitaxel + Carboplatin	1	0	1
Cyclophosphamide + Doxorubicin	0	1	1
Docetaxel + Carboplatin + Erlotinib	1	0	1
Paclitaxel + Carboplatin + 5 - Fluorouracil	1	0	1
Total	71	37	108

RT*= Radiation Therapy

Table No: 03 shows distribution of male and female patients according to different chemotherapeutic agents prescribed. Only 31 out of 71 male patients and 12 out of 37 female patients received chemotherapy as an intervention. Among 43 patients prescribed with Chemotherapy, Cisplatin (alone) was the most prescribed chemotherapeutic agent (11) and Erlotinib and 5-Fluorouracil were the least prescribed.

Table No. 04: Prescription pattern of analgesics with combination before surgery:

Analgesics prescribed	Combination	Gender		Total
		Male	Female	
Not Prescribed	Not Prescribed	19	8	27
Fentanyl	Not Prescribed	3	1	4
	Total	3	1	4
Paracetamol	Not Prescribed	35	16	51
	Fentanyl	3	5	8
	Tramadol	1	0	1
	Xylocaine	2	5	7
	Total	41	26	67
Tramadol	Not Prescribed	2	0	2
	Total	2	0	2
Xylocaine	Not Prescribed	4	2	6
	Fentanyl	2	0	2
	Total	6	2	8
Total	Not Prescribed	63	27	90
	Fentanyl	5	5	10
	Tramadol	1	0	1
	Xylocaine	2	5	7
Total		71	37	108

*NS=Not Significant

Table No: 04 shows pattern of prescribing analgesics among male and female patients before therapy. Paracetamol was the most prescribed analgesic in 41 male and 26 female patients (67 out of 108 total patients) and Fentanyl was mostly prescribed as a combination with Paracetamol in 3 male and 5 female patients. P-value 0.077 shows that there is no significant difference in the pattern of prescribing analgesics in male and female patients.

Table No. 05: Prescription pattern of analgesics with combination after surgery:

Analgesics prescribed	Combinations	Gender		Total
		Male	Female	
Not Prescribed	Not Prescribed	9	3	12
Fentanyl	Not Prescribed	8	4	12
	Diclofenac	2	0	2
	Tramadol	1	0	1
	Xylocaine	1	0	1
	Total	12	4	16
Paracetamol	Not Prescribed	18	7	25
	Fentanyl	22	11	33
	Diclofenac	1	4	5
	Tramadol	6	5	11
	Total	47	27	74
Tramadol	Fentanyl	1		1
	Total	1		1
Xylocaine	Fentanyl	2		2
	Total	2		2
Morphin	Fentanyl		2	2
	Total		2	2
Paracetamol & Ibuprofen	Fentanyl		1	1
	Total		1	1
Total	Not Prescribed	35	14	49
	Fentanyl	25	14	39
	Diclofenac	3	4	7
	Tramadol	7	5	12
	Xylocaine	1	0	1
Total		71	37	108

*NS=Not Significant

Table No: 05 shows pattern of prescribing analgesics among male and female patients after therapy. Paracetamol was the most prescribed analgesic in 47 male and 27 female patients (74 out of 108 total patients) and Fentanyl was mostly prescribed as a combination with Paracetamol in 22 male and 11 female patients. P-value 0.146 shows that there is no significant difference in the pattern of prescribing analgesics in male and female patients.

Table No. 06: Table represents the overall evaluation of outcome in different therapy:

Type of Therapy	Total No. of Pts	Recovered	Not Recovered	Percentage of Recovery
Chemotherapy	43	36	7	83.7
Radiotherapy	35	25	10	71.42
Surgery	91	76	15	83.51
Concurrent Chemo-Radiotherapy	25	20	5	80

Figure No. 05: Figure represents the overall evaluation of outcome in different therapy:

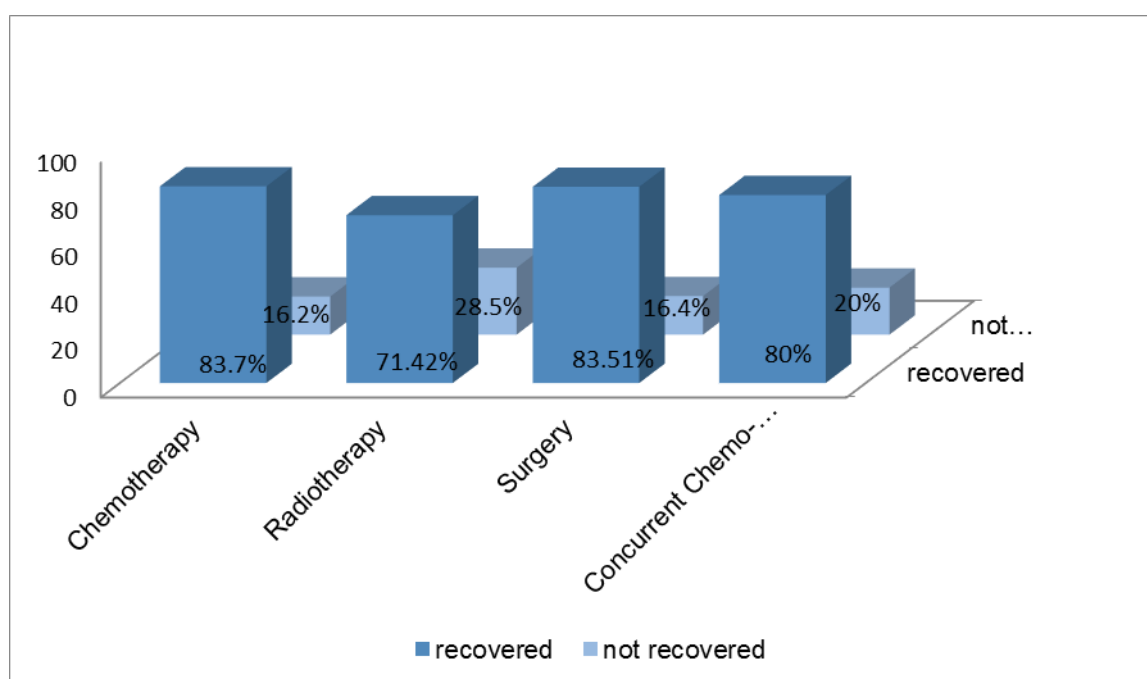


Table No 06 and Fig No 05 show the percentage of patients recovered after different multidisciplinary approaches. Chemotherapy showed the highest recovery of 83.7%, followed by Surgical therapy 83.51% recovery.

DISCUSSION:

Head and neck cancer (HNC) is defined as malignant tumors located in the upper aerodigestive tract (paranasal sinuses, nasopharynx, oropharynx, hypopharynx, oral cavity, nostrils and salivary glands). HNCs are often referred to as squamous cell carcinomas. It is necessary to emphasize that the most important risk factor continues to be tobacco along with alcohol, but the infection by Human Papilloma Virus (HPV) is a key factor in the origin of some these tumors and confers them special characteristics that possibly in the future

conditions could provide better understanding in the treatment modality. HNCs are one of the most common cancers worldwide with case of over 77000 diagnoses per year. It is a neoplasm with high possibility of cure if diagnosed in early stages, but unfortunately, two-thirds of the patients are diagnosed at an advanced locoregional stage (stage III and IV, without metastasis). There are mainly five types of HNCs based on the location they develop; laryngeal and hypo-pharyngeal cancer, nasal cavity and paranasal sinus cancer, nasopharyngeal cancer, oral and oropharyngeal cancer and salivary gland cancer. Other types of cancer include brain tumors, esophageal cancer, eye cancer, parathyroid cancer, thyroid cancer. The treatment approach for HNCs could be done by any of these three, singly or by combination therapy (palliative and adjuvant therapy), surgery, chemotherapy and radiation. Radiotherapy traditionally offered higher rates of organ preservation and for some cancers where organ function is important. It is also the treatment of choice for carcinomas of the larynx and tongue base as it allows preservation of natural speech and swallowing. The choice of treatment modality therefore depends on individual factors including patient preference. For advanced squamous cell carcinoma of the head and neck single modality treatment (either surgery or radiotherapy alone) is associated with poor outcomes. For these tumors, the combined use of surgery and postoperative radiotherapy or use of combined chemotherapy and radiation offers the highest chance of achieving cure. More than one million cases of head and neck cancer are reported in India annually. The health professionals together with clinical pharmacist are concern about preserving the function of the affected areas as much as they can and helping the patient return to normal activities as soon as possible after treatment.

Gender: The study conducted on head and neck cancer patients showed that the highest numbers of patients diagnosed with different types of Head and Neck cancer were male, constituting 65.7% of the total population included in the study. Figure no. 1 shows a detailed representation of distribution of patients according to their gender, where male patients constitute 65.7% and female patients constitute 34.3%. A similar result was see in a study conducted by Poonam Joshi, et al. on Head and Neck Cancers in Developing Countries, which showed that Head and Neck cancers are the most common type of cancer in males and fifth most common type of cancer in females. Figure no. 3 give a description about the relationship between different age groups and gender; it was found in the current study that there is no significant association in distribution of patients based on age groups and gender, using chi-square tests. Maximum number of male patients belonged to the age group of 60-70

years and female patients belonged to the age group of 50-60 years. The same study by Poonam Joshi, et al. also showed that oral cavity cancer (cancer of tongue) was the most common type of head and neck cancer seen in developing countries like India. The current study also showed that cancer of oral cavity is the most diagnosed type of cancer accounting for 34 cases out of 108 patients included in the study, which included both male (21) and female (13) patients, which are represented in Table no. 02 and Figure no. 04.

Age: As illustrated in table no. 1, patients of various age group was enrolled for the current study, among them the maximum number of patients was seen in the age group of 50-60 years having 29 patients out of 108 total patients with a percentage of 26.9% compared to other age groups of shown in the table. Next, highest number of patients was in the age group of 60-70 years and 40-50 years with 25 (23.1%) and 18 (16.7%) patients respectively. The lowest number of patients was seen in the age group of 80 year and above with 5 patients out of total 108 patients, with percentage of 4.6%. The youngest patient included in our study was of 23 years and the oldest patient included in the study was of age 91 years. Similar results were seen in a study conducted by George S. Stoyanov, et al. on Demographics of Head and Neck Cancer Patients: A Single Institution Experience. The study result showed that maximum number of cases was seen in the mean age of 65 years or in an average age group of 50-70 years. Figure no. 3 gives a representation of patient distribution based age and gender. From the current study, it was found that maximum number of patients was present in the age group of 50-60 years with a total of 29 patients out of which 18 were male and 11 were female. The lowest number of patients was seen in the age group of 80 year and above with 5 patients out of which all were male. A statistical test done to determine whether there was a significance association in distribution of patients based on age groups and gender, using chi-square tests showed negative significance.

Social history: As shown in figure no. 02, patients with various social histories were selected for the study. 51.9% of the patients had history of alcohol intake or tobacco use either in the form of cigarettes or chewing tobacco or betel nut chewing. 52 out of 108 patients selected for the study had no history of alcohol or tobacco use, among which 30 were the female patients included in the study. It shows that in male patients head and neck cancer occurs predominantly because of their social history than females. The highest number seen was that of patients with both smoking and alcohol use, with 26 patients. Smokers were the second highest group with 21 patients. In a study conducted by Poonam Joshi, et al. on Head and

Neck Cancers in Developing Countries, showed similar results which stated that, in countries like India tobacco use is one of the major cause for Head and Neck Cancer. Since 52 patients had no history of either tobacco or alcohol usage, we cannot comprehend that tobacco and alcohol usage alone is causing head and neck cancer. In a largely populated city like Bangalore, exposure to various pollutants and carcinogenic toxins also play a major role in development of Head and Neck Cancer. India has a large cultural connection with use of tobacco and betel nut, it is a common habit of most rural/village people to use chewing tobacco or betel nut in most of the circumstances and any occasional events. This would be a major reason for development of large number of oral cancer in India, in both males and females.

Surgical intervention and distribution of patient data: Among the 108 patients included in the study 91 patients were treated with surgical approaches out of which 59 were male and 32 were female. Various surgical procedures were selected according to the patient's final diagnosis. Surgical approaches like Total Thyroidectomy, Total Parotidectomy, Total Laryngectomy, Selective Neck Dissection, Wide Local Excision, Tracheostomy, etc. were some of the commonly done surgical procedures. Patients were selected for surgical procedure based on the data obtained from their imaging studies. In the current study conducted a total of 17 patients did not receive any kind of surgical intervention, out of which 12 were male patients and 5 were female patients. The commonly repeated surgical procedure was Wide Local Excision in total of 11 patients out of which 7 were male and 4 were female patients. The next commonly seen approach was Total Thyroidectomy in total of 9 patients out of which 4 were male and 5 were female patients. From the current study, it was shown that Oral Cavity cancer was the most diagnosed type of cancer patients and Wide Local Excision was the most prescribed surgical intervention for this type of cancer. Out of 29 oral cavity cancer patients who received Surgery, Wide Local Excision was performed in 9 patients, followed by Hemi Mandibulectomy and Partial Mandibulectomy in 3 patients each respectively. The next most diagnosed type was Carcinoma of Larynx and Tracheostomy and Total Laryngectomy was the most performed surgical approach. Out of 20 Laryngeal cancer patients who received Surgery, Tracheostomy and Total Laryngectomy was performed in 5 patients, followed by Salvage Neck Dissection and Total Laryngectomy in 3 patients each respectively.

Chemotherapeutic intervention and distribution of patient data: Table no. 03 shows prescription pattern of chemotherapy in male and female patients included in the study. Based on the different diagnosis done, only 43 patients received chemotherapy as a treatment intervention, out of which 31 were male and 12 were female patients. 65 patients out of total 108 patients received either surgery or radiation as a treatment option. Chemotherapy was only prescribed to those patients who had a chance of metastasis shown in imaging study. Chemotherapeutic agents like Cisplatin, Carboplatin, Cetuximab, Paclitaxel, etc. were the most commonly prescribed chemotherapeutic agents. Among these Cisplatin alone was the most prescribed chemotherapeutic agent in a total of 13 patients out of which 11 were male and 2 were female, followed by Carboplatin and Paclitaxel given as a combination in a total of 7 patients out of which 4 were male and 3 were female patients. Cisplatin was also the most prescribed chemotherapeutic agent in case of concurrent chemo-radio therapy (CTRT) with 6 patients who were all male patients. Oral cavity cancer was the most diagnosed type of cancer, out of 29 cases of Oral Cavity Cancer 14 were prescribed with Chemotherapy. The most commonly prescribed chemotherapeutic agent was Cisplatin in 7 patients, i.e., 4 patients as Chemotherapy alone and in 3 patients as Concurrent Chemo-Radiotherapy.

Radiotherapy intervention and distribution of patient data: 35 patients out of 108 patients included in the study, received radiotherapy out of which 25 were male patients and 10 were female patients. Different cycles of 58gys, 60gys, 66gys and 70gys were the different doses of radiation used. Dose and cycle for radiation therapy were selected based on different patient characteristics. 60gys was the most commonly prescribed dose for radiotherapy. Cycles for the therapy varied according to the progress of the patient. In case of concurrent chemo-radio therapy the most prescribed drug was cisplatin and the dose of radiation varied according to individual characteristics of the patient. It was shown that Oral cavity cancer was the most common type of cancer diagnosed and various cycles of 60gys of radiation was the most commonly prescribed dose of the radiation, other doses prescribed were 58gys, 66gys and 70gys. Concurrent Chemo-Radiotherapy was also used, where Cisplatin and Carboplatin were used along with various doses of radiation therapy.

Pain management before surgery: As shown in table no. 04, Pain Management was done based on the pain score value evaluated during the time of admission of the patient. Out of 108 patients, 27 patients (21.4%) had no complaint of pain during the time of admission, rest 81 patients were treated with various analgesics according to their pain score. Different

Analgesics used were Paracetamol, Fentanyl, Tramadol, and Xylocaine. The most commonly prescribed analgesic was Paracetamol in 67 patients (53.1%) out of 108 total patients. Similar results were seen in a study conducted by Mirabile A, et al., which showed that Paracetamol was mostly prescribed as analgesic in various hospitals setting in India. Using Chi-Square test it was shown that there was no significant association between prescribing the combinations with other analgesics. The other analgesics were Xylocaine in 15 patients (11.9%), Fentanyl in 14 patients (11.1%) and Tramadol in 3 patients (2.3%).

Pain management after surgery: As shown in table no. 05, Pain Management was done based on the pain score value evaluated after the surgery. Out of 108 patients, 12 patients (7.1%) had no pain management required. Remaining 96 patients received analgesics according to their pain score. Different agents used to manage pain after surgeries were Paracetamol, Fentanyl, Xylocaine, Tramadol, Morphine, Paracetamol + Ibuprofen and Diclofenac. Among these the most commonly used analgesic was Paracetamol in 74 patients (44.3%) out of 108 total patients. Similar results were seen in a study conducted by Mirabile A, et al., which showed that Paracetamol was mostly prescribed as analgesic in various hospitals setting in India. Using Chi-Square test it was shown that there was no significant association between prescribing the combinations with other analgesics. Other analgesics were Fentanyl, Xylocaine, Tramadol, Morphine, with 55 (32.9%), 14(8.3%), 8 (4.7%), 2 (1.1%) patients respectively.

Outcome evaluation: As shown in table no. 06, outcome after each treatment approach was evaluated to determine the best treatment option in Head and Neck Cancer patients. From the current study, it was determined that Chemotherapy alone had a recovery rate of 83.7%, i.e., out of 43 patients who received chemotherapy 36 patients recovered i.e., showed no signs of metastasis or recurrence and 7 patients were not recovered i.e., showed signs of recurrence or metastasis. Surgery alone had a recovery rate of 83.51% i.e., out of 91 patients who undergone surgery 76 patients recovered i.e., showed no signs of metastasis or recurrence and 15 patients were not recovered i.e., showed signs of recurrence or metastasis. Concurrent Chemo-Radiotherapy had a recovery rate of 80% i.e., out of 25 patients who undergone surgery 20 patients recovered i.e., showed no signs of metastasis or recurrence and 5 patients were not recovered i.e., showed signs of recurrence or metastasis. Radiotherapy alone had a recovery rate of 71.42% i.e., out of 35 patients who undergone surgery 25 patients recovered i.e., showed no signs of metastasis or recurrence and 10 patients were not recovered i.e.,

showed signs of recurrence or metastasis. This result has been illustrated in table no. 06 and figure no. 05. Similar results were seen in a study conducted by Cristiana Lo Nigro, et al., on Head and neck cancer: improving outcomes with a multidisciplinary approach.

CONCLUSION

Head and Neck cancer are one of the most common types of cancer in most of the developing countries. It is the most common type of cancer in males and the fifth most common in females. Among various types of Head and Neck cancers, Oral cavity or oral cancer was the most common type seen. This may be due to the traditional use of tobacco and betel nut etc. The main risk factors like tobacco use as cigarette, chewing tobacco, betel nut chewing and alcohol use were mostly seen in the patients involved in the study. Due to exposure to various toxic pollutants can also result in head and neck cancer.

Chemotherapy was the treatment option with most recovery. Chemotherapy can be easily performed and had higher degree of patient acceptance than other treatment approaches. Cisplatin is most commonly used chemotherapeutic agent because cisplatin has high patient compliance and can be administered along with other therapies like radiation and surgery without any complication. Cisplatin has highest recovery rate (94.3%) almost all patient treated with Cisplatin has been recovered, it is also cost effective and has causes reduced side effects an improved efficacy when compared to other chemotherapeutic agents like Carboplatin, Cetuximab, Paclitaxel, etc. Surgical approach depends on patient specific characteristics; Wide local Excision is helps in overall patient compliance and reduce the chance of recurrence than other surgical approach followed because in wide local excision all the affected tissue is removed up to a margin of normal tissue. Radiation therapy was prescribed in patients who have lesser affinity towards other treatment options and Radiation therapy was commonly prescribed as concurrent chemo-radiation therapy to improve the efficacy of the treatment option. Cisplatin and different doses like 66gys, 60gys, and 70gys were commonly prescribed options. Pain score of the patient was analyzed before and after therapy mainly in case of surgical patients and their management was also studied. Paracetamol, Fentanyl, Tramadol, Xylocaine, etc. were commonly prescribed analgesics. Among these Paracetamol was most prescribed.

Treatment option in Head and Neck cancer should be appropriately chosen specific to the patient by the multidisciplinary team. The treatment option must not only cure the patient but

should also retain the function of the affected organ or tissue. For the above reason Chemotherapy is the better option with better efficacy and safety of the patient.

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