A study to assess the effect of Palliative care on quality of life of patients suffering from advance bronchogenic carcinoma

Ajay Kundu
PG resident, Pulmonary Medicine, MMIMSR (deemed to be university), Mullana, Ambala, Haryana, India

Sameer Singhal
Professor, Pulmonary Medicine, MMIMSR (deemed to be university), Mullana, Ambala, Haryana, India

Jai Kishan
Professor & HOD, Pulmonary Medicine, MMIMSR (deemed to be university), Mullana, Ambala, Haryana, India

Achchhar Singh
Associate professor, Pulmonary Medicine, MMIMSR (deemed to be university), Mullana, Ambala, Haryana, India

Ajit Yadav
Assistant professor, Pulmonary Medicine, MMIMSR (deemed to be university), Mullana, Ambala, Haryana, India

Abstract---To assess the effect of Palliative care on quality of life of patients suffering from advance bronchogenic carcinoma. The present cross-sectional study was conducted in the department of respiratory medicine, M.M. Institute of Medical Sciences and Research, Mullana. Total 48 patients presented with Stage IV lung carcinoma to the department of respiratory medicine were considered for the study. After checking the inclusion and exclusion criteria, patient were enrolled in the study. Thorough detailed history was taken from all the patients and recorded on a proforma. Symptoms of the patients will be recorded. For grading of dyspnea, MMRC scale was used. Thorough physical examination was done and recorded. Radiological investigations in the form of X-ray chest and/or CT scan (whenever appropriately required was done). All these patients were then subjected to ECOG (Eastern Cooperation Oncology Group) score and EORTC LC-29 European Organisation for Research and Treatment of

Cancer -Lung Cancer 29) and KP score (Karnofsky Performance Scale index) score for performance status at the time of presentation/diagnosis and receiving palliative treatment. The average age of the participants in the study was 57.39 years. Out of the total 48 patients 38 (79.2%) were males and 10 (20.8%) was female. 47 (97.9%) were married and 1 (2.1%) was un-married. Majority of the study population resides in rural setup (54.2%). Major symptom reported by the study population was pain (93.8%) followed by shortness of breath (75.0%). The most common co-morbidity reported was COPD (41.7%). The most common sub-type of Bronchogenic Carcinoma observed in the study population was squamous cell (39.6%). The following types of palliative care (Analgesics, i.v Fluids, Anti-tussives, Antibiotics, Nebulizations, Reassurance therapy, Physiotherapy, Psychotherapy) was given in all the 48 (100.0%) of the study subjects followed by Palliative Chemotherapy (79.2%), Oxygen support (47.9%). Mean difference of the values of ECOG, MMRC and KP score at admission and at discharge was found statistically significant on paired-test analysis (p=0.001). The incorporation of high-quality palliative care into routine clinical care for patients with lung cancer is critical for preserving function and optimizing QOL through survivorship. An interdisciplinary palliative care model can effectively and quickly connect patients to the appropriate supportive care services.

Keywords---palliative care, lung cancer, QOL.

Introduction

In the beginning of the century, lung cancer was considered to be rare. Since, 1985 lung cancer is the most commonly diagnosed cancer annually and it has reached epidemic proportions. In developed countries lung cancer is the leading cause of death and is rising at alarming pace in developing countries. In India, approximately 63,000 new lung cancer cases are reported each year. Tobacco smoking is the most imperative risk factor for lung cancer, more than 80 % or 1 in 9 smokers develops lung cancer. The cumulative risk of lung cancer in lifelong heavy smokers is 30 % and in non-smoker it is less than 1%. Lung cancer risk is proportional to number of cigarettes consumption, the age of onset of smoking the degree of inhalation nicotine and tar content of cigarette and use of un-filter cigarettes, genetic predisposition and individual susceptibility is also a factor in carcinogenesis. Other known significant risk factors in the pathogenesis of lung cancer include exposure to radon gas, asbestos and air pollution, as well as genetic factors. One of the key factors initiating the pathogenesis of lung cancer is through direct exposure to reactive oxygen species (ROS) and via activation of polymorphonuclear neutrophils. This leads to alterations in cell-signaling and mutations, and ultimately to carcinogenesis.

Several studies have shown that the early palliative care (EPC) along with chemotherapy has beneficial effects not only on the quality of life of the patients, reducing the symptoms of depression, but also it reduces the number of intensive

(not always necessary) medical procedures at the end of life. However, what is most important, EPC prolongs life. Palliative care consisting in the management of the cancer-related symptoms and psychological support is a key element in the treatment of patients with metastatic non-small cell lung cancer (NSCLC). Therefore, the palliative care physician becomes an important member of the multidisciplinary team deciding on the therapy management. The guidelines of international scientific societies emphasize the importance of the implementation of palliative care immediately after metastatic lung cancer was diagnosed. Despite considerable clinical research in multimodality cancer treatment, there has been no significant decline in the cancer-specific mortality over the past three decades. In such a grim scenario, growing importance is now being given to the proper evaluation and maintenance of quality of life (QOL) of these patients.

Over the past few years, several studies have focused primarily on the QOL as the end point in lung cancer. In spite of the growing interest in this area, there are scant data regarding the assessment of QOL from developing countries, and most trials have been conducted in the developed world. Furthermore, since regional, cultural, linguistic and social variations have a significant bearing on QOL and its perception, geographical and ethnic variations are expected. Lung cancer is often associated with multiple symptoms, commonly dyspnoea, cough, haemoptysis, pain and anorexia. Although dyspnoea can negatively influence QOL, the literature describing the relationship between these two complex phenomena in lung cancer patients is scant. Furthermore, adults with lung cancer often report higher levels of symptom distress than adults with other types of cancer. Quality of life has been closely linked with symptom prevalence and intensity in patients with lung cancer.

Performance status has been used as a proxy measure of QOL and correlates well with global QOL. The Karnofsky Performance Status (KPS) is a widely used method to assess the functional status of a patient. It was introduced by David A. Karnofsky and Joseph H. Burchenal in 1949. The ECOG Performance Status (ECOG PS), an alternative status assessment, was developed by the Eastern Cooperative Oncology Group and derived from the KPS. For years, the KPS and ECOG PS have been commonly used in evaluation of performance status. With respect to a patient's functional status, the Eastern Cooperative Oncology Group Performance Status (ECOG PS) is an often used alternative to the KPS. Another questionnaire for accessing the quality of life is LC-29. The European Organization for Research and Treatment of Cancer (EORTC) QLQ-LC13 was the first published in 1994. Since then, major advances have occurred in the treatment of lung cancer. So, the questionnaire was updated and the new questionnaire comprises of 29 questions and is named EORTC QLQ-LC29. It retained 12 of the 13 original items and is supplemented with 17 items that primarily assess treatment side-effects of traditional and newer therapies. In this study, we assessed the effect of palliative treatment in the form modalities like analgesics, pulmonary rehabilitation, counseling on the quality of life of patients with TNM stage 4 lung cancers that may or may not be receiving palliative chemotherapy or radiotherapy. The quality of life was assessed using questionnaire before starting palliative care and after finishing palliative care.

Materials and Methods

The present cross-sectional study was conducted in the department of respiratory medicine, M.M. Institute of Medical Sciences and Research, Mullana, Ambala, Haryana. Total 48 patients presented with Stage IV lung carcinoma to the department of respiratory medicine were considered for the study.

Informed consent and ethical approval

Informed and written consent (in the language they best understand) was obtained from each subject before collecting data and blood sample. The study has not imposed any burden on the subjects and the Institute; therefore, the study is ethically justified. The proposed study was undertaken with the approval granted by Institutional Ethical Committee.

Inclusion criteria

- Patients presented with Stage IV lung carcinoma
- Who volunteer to participate in the study
- As per assessment by Kernofsky Performance Scale and Eastern Cooperative Oncology Group Scale as well as EORTC LC29 Questionnaire.
- Patients who have received palliative chemotherapy or radiotherapy as per the requirement.

Exclusion criteria

- Recent MI within 1 month
- Pediatric Population
- Hemodynamically unstable patients
- Sputum positive pulmonary tuberculosis patients

Palliative care

- Analgesics for pain
- Antitussive for cough
- Antibiotic for secondary infection
- Oxygen, Nebulization for breathlessness
- ICU care with Non invasive Ventilation (NIV) or Mechanical Invasive Ventilator support for extensive disease'
- Anti-fibrinolytic therapy in case of hemoptysis
- Psychotherapy and proper counseling of the patient regarding the disease
- Physiotherapy
- Ryles Tube or surgical management (eg-gastrostomy) for dysphagia
- Reassurance therapy or pen paper methods for hoarseness of voice
- Palliative chemotherapy: if indicated according to KP and ECOG scores
- Palliative radiotherapy: if indicated according to KP and ECOG scores.

Investigations

- CECT Chest was done on patients presenting with a mass on chest x-ray and clinically suspicious of malignancy as it is useful for diagnosing and staging of the lung cancer and also in follow up
- USG Abdomen was done to check for any metastasis in patients diagnosed as lung cancer
- Transthoracic fine needle aspiration- TTFNA was used in appropriate clinical settings for investigation of patients with a lung mass lesion, usually peripheral and was used for histopathological diagnosis of lung cancer
- Bronchoscopy- it was done in appropriate clinical case for confirming the diagnosis. Through bronchoscopy we have collected the BAL fluid and did its cytology, did Trans-bronchial needle aspiration (TBNA) which was sent for cytology and finally a biopsy of the mass also taken and sent for histopathology. Brushing, transthoracic needle aspiration was also done in lesions abutting chest wall.
- Blood investigations mainly CBC, LFT, RFT were done before starting chemotherapy.

Methodology

After checking the inclusion and exclusion criteria, patient were enrolled in the study. Thorough detailed history was taken from all the patients and recorded on a proforma. Symptoms of the patients will be recorded. For grading of dyspnea, MMRC scale was used. Thorough physical examination was done and recorded. Radiological investigations in the form of X-ray chest and/or CT scan (whenever appropriately required was done). All these patients were then subjected to ECOG (Eastern Cooperation Oncology Group) score and EORTC LC-29 European Organization for Research and Treatment of Cancer -Lung Cancer 29) and KP score (Karnofsky Performance Scale index) score for performance status at the time of presentation/diagnosis and receiving palliative treatment. The Karnofsky score runs from 100 to 0, where 100 is "perfect" health and 0 is death. Although practitioners occasionally assign performance scores in between standard intervals of 10. The primary purpose of it is to evaluate a patient's ability to survive chemotherapy.

Statistical analysis

The recorded data was compiled and entered in a spreadsheet computer program (Microsoft Excel 2010) and then exported to data editor page of SPSS version 20 (SPSS Inc., Chicago, Illinois, USA). Descriptive statistics included computation of percentages, means and standard deviations were calculated. The statistical tests applied for the analysis were Pearson's chi-square test (χ^2) and paired t-test was used. The confidence interval and p-value were set at 95% and ≤ 0.05 respectively.

Results

Table 1
Demographic details of the study population

Age (In years)	Frequency (N=48)	%age
18-27	1	2.1
38-47	8	16.7
48-57	15	31.3
58-67	15	31.3
>67	9	18.8
Mean±SD	57.39±12.21	
Gender		
Female	10	20.8
Male	38	79.2
Marital Status		
Un-married	1	2.1
Married	47	97.9
Residence		
Rural	26	54.2
Urban	22	45.8

The average age of the participants in the study was 57.39 years. Only (18.9 percent) of the patients were found to be between the ages of 18-47 years, with the remaining (81.1 percent) being over the age of 47 years. Out of the total 48 patients 38 (79.2%) were males and 10 (20.8%) was female. 47 (97.9%) were married and 1 (2.1%) was un-married. Majority of the study population resides in rural setup (54.2%) and rest (45.8%) resides in urban setting.

Table 2
Distribution of the study population according to presenting symptoms, co-morbidities and deleterious habits

Variables	Frequency (N=48)	%age
Symptoms		
Shortness of Breath	36	75.0
Pain	45	93.8
Hemoptysis	18	37.5
Hoarseness of voice	9	18.8
Weight Loss	19	39.6
Fever	11	22.9

Edema	15	31.3
Cough	23	47.9
Co-morbidities		
Diabetes Mellitus	7	14.6
Hypertension	9	18.8
COPD	20	41.7
CAD	5	10.4
Hypothyroidism	1	2.1
Habits		
Smoker/Ex-smoker	41	85.4
Alcohol	25	52.1

Major symptom reported by the study population was pain (93.8%) followed by shortness of breath (75.0%), cough (47.9%), weight loss (39.6%), Hemoptysis (37.5%), edema (31.3%) and Hoarseness of voice (18.8%). The most common co-morbidity reported was COPD (41.7%) followed by hypertension (18.8%), diabetes (14.6%), CAD (10.4%) and hypothyroidism was reported in (2.1%).

Table 3
Distribution of the study population according to subtypes of Bronchogenic Carcinoma

Subtype of Bronchogenic Carcinoma	Frequency (N=48)	%age
Adenocarcinoma	17	35.4
Squamous cell	19	39.6
Large cell	1	2.1
Small cell carcinoma	9	18.8
Non-differentiated NSC Carcinoma	1	2.1
Un-specified	1	2.1
Total	48	100.0

The most common sub-type of Bronchogenic Carcinoma observed in the study population was squamous cell (39.6%) followed by Adenocarcinoma (35.4%) and Small cell carcinoma (18.8%).

Table 4
Distribution of the study population according to palliative care given

Palliative care	Frequency (N=48)	%age
Analgesics	48	100.0
i.v Fluids	48	100.0
Anti-tussives	48	100.0
Antibiotics	48	100.0

Nebulizations	48	100.0
Oxygen support	23	47.9
Non-invasive ventilation	4	8.3
Mechanical invasive ventilation	2	4.2
Anti-fibrinolytic Therapy	12	25.0
Ryle tube feeding	6	12.5
Reassurance therapy	48	100.0
Physiotherapy	48	100.0
Psychotherapy	48	100.0
Pleural fluid aspiration	12	25.0
ICD tube	5	10.4
Palliative Chemotherapy	38	79.2
Palliative Radiotherapy	12	25.0
Total	48	100.0

The following types of palliative care (Analgesics, i.v Fluids, Anti-tussives, Antibiotics, Nebulizations, Reassurance therapy, Physiotherapy, Psychotherapy) was given in all the 48 (100.0%) of the study subjects followed by Palliative Chemotherapy (79.2%), Oxygen support (47.9%), Anti-fibrinolytic Therapy, Pleural fluid aspiration and Palliative Radiotherapy (25% each), Ryle tube feeding (12.55), ICD tube (10.0%), Non-invasive ventilation (8.3%) and Mechanical invasive ventilation (4.2%).

Table 5
Comparison of Mean ECOG, KP score and MMRC at admission and at discharge

Outcome		Mean	N	Std. Deviation	p-value
ECOG	At admission	3.22	48	0.66	0.001 (Sig.)
	At discharge	2.31	48	0.74	
KP score	At admission	39.58	48	13.36	0.001 (Sig.)
	At discharge	55.83	48	14.26	
MMRC	At admission	3.37	48	0.67	0.001 (Sig.)
	At discharge	2.45	48	0.61	

Mean ECOG at admission was 3.22±0.66 and at discharge 2.31±0.74. The difference between them was found statistically significant on paired-test analysis (p=0.001).Mean KP score at admission was 39.58±13.36 and at discharge 55.83±14.26. The difference between them was found statistically significant on paired-test analysis (p=0.001).Mean MMRC at admission was 3.37±0.67 and at discharge 2.45±0.61. The difference between them was found statistically significant on paired-test analysis (p=0.001).

Discussion

In developing country like India majority of the people live in rural areas, many living below poverty line lacks formal education and health awareness. Usually don't access health services because of poverty, illiteracy, lack of availability in peripheral health institutions. The services of diagnosis and treatment are mainly concentrated in the urban areas and are many times away from the reach of common man. Moreover despite of accessing health services early there is often delay in diagnosis by secondary or tertiary care centers. In our setting patients came to us with IVth TNM stage of lung cancer mainly due to poverty, ignorance, illiteracy, lack of knowledge of disease and taking repeated treatment from quacks before the disease is diagnosed properly and by that time patient progress to extreme stages of lung cancer. In a national cancer database survey of patients diagnosed with non small cell lung carcinoma, majority of the patients were at stage IV (38.1%) at time of initial diagnosis followed by stage III (27.6%), stage 1(26%) and stage II (8.3%).

In the present study the demographic distribution of factors like age and gender are discussed as, the mean age of the patients in the current study are 57.39±12.21which are in accordance with study conducted by Prasad et al. in a clinico-pathological study of bronchogenic carcinoma where the mean age was found to be 58 years. Out of total 48 patients; 38 were males and 10 female. Majority of them are from rural area and are below poverty line where females are taken less care, dependent on males for taking treatment from secondary or tertiary care centers. Similar gender distribution was observed by Bhattacharya et al. his study conducted on bronchogenic carcinoma in young adults.

In the present investigation the major symptom reported by the study population was pain (93.8%) followed by shortness of breath (75.0%), cough (47.9%), weight loss (39.6%), hemoptysis (37.5%), edema (31.3%) and Hoarseness of voice (18.8%). Symptoms of carcinoma usually are cough, chest pain, dyspnea and hemoptysis but these symptoms are usually non specific. In case of complications patient may have hoarseness of voice, dysphagia, svc syndrome which can be more specific of carcinoma and may occur late in course of disease. Same pattern is seen in other studies. The most common co-morbidity reported was COPD (41.7%) followed by hypertension (18.8%), diabetes (14.6%), CAD (10.4%) and hypothyroidism was reported in (2.1%). Some nonmalignant diseases have been associated with an increased risk for lung cancer, the strongest association being with COPD. Tobacco smoking is the primary cause of both lung cancer and COPD. A study of women never smokers with lung cancer showed a statistically significant association between the presence of airflow obstruction and the development of lung cancer. There is other evidence that airflow obstruction is a risk for lung cancer.

Among the histological distribution majority of the cases were squamous cell carcinoma followed by adenocarcinomas and small cell carcinoma. Similar distribution was observed by Jindal SK et al. in a 10 year study on clinical spectrum of primary lung cancer. They also found adenocarcinomas and squamous cell carcinoma to be the commonest histological variant of lung cancer.

Mean mMRC at admission was 3.37±0.67 and at discharge 2.45±0.61. The difference between them was found statistically significant on paired-test analysis (p=0.001). On EORTC LC-29 at discharge after administering palliative care majority patients (91.7%) showed no or little shortness of breath while resting. 79.1% had not at all or little shortness of breath while walking and 56.3% showed not at all or little shortness of breath while climbing stairs.

Similar results were observed in other studies on patients with lung cancer (Smith et al. and Tanaka et al.) and other chronic lung diseases (Moody et al. 1990; Schrier et al. 1990) where dyspnoea demonstrated a close association with QOL, in particular, physical function. Dyspnoea is a multifaceted phenomenon with inter-related physiological, psychological and sociological components (Gift 1990). In the present study mean KP score at admission was 39.58±13.36 and at discharge 55.83±14.26. The difference between them was found statistically significant (p=0.001) improvement after the administration of palliative care. This was found in agreement with the study conducted by Jennifer S Temel et al. conducted a study of early palliative care with cisplatin based chemotherapy regimens in advanced metastatic non small cell lung cancer to that of best supportive care and came to a conclusion that in patients with good performance status early palliative chemotherapy led to significant improvement in quality of life as compared with patients receiving standard care. As compared to patients receiving standard care, patients receiving early palliative care had less aggressive care at end of life but longer survival.

In case of symptomatic response post chemotherapy a similar trend was seen. Those with a high KPS showed better resolution of symptoms post chemotherapy and those patients with low KPS showed lesser resolution of symptoms. Similar results were seen by Mohan et al in a study conducted to see the effect of Change in Symptoms, Respiratory Status, Nutritional Profile and Quality of Life on Response to Treatment for Advanced Non-small Cell Lung Cancer. They concluded that Patients with higher constitutional symptoms, higher smoking burden, and poor KPS are less likely to respond to chemotherapy and patients with a higher KPS score \ have a better prognosis and respond better to chemotherapy. It showed statistically significant association (p≤0.05) between the treatment and outcome. Similar results were seen by M Bhutani et al. in a Retrospective Cohort study conducted in AIIMS, New Delhi regarding Survival in small cell lung cancer in India with regard to Prognostic utility of clinical features, laboratory parameters and response to treatment. They concluded that Cumulative symptom burden, KPS score, disease extent and symptomatic assessment of improvement after treatment, are useful predictors of survival and patients with a higher KPS score respond better to chemotherapy and have a better prognosis.

Conclusion

The present study concluded that the incorporation of high-quality palliative care into routine clinical care for patients with lung cancer is critical for preserving function and optimizing QOL through survivorship. An interdisciplinary palliative care model can effectively and quickly connect patients to the appropriate supportive care services.

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