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Original Research Article

A comparative study of quality of life with respect to EORTC scale in lung cancer patients undergoing chemo radiation

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ABSTRACT

Background: In lung cancer patient's data regarding comparison of quality-of-life pre and post treatment as per EORTC score is sparse. So, we conducted this study on lung cancer patients to compare the quality of life.
Methods: Demographic data were collected from new lung cancer patients (not taking treatment elsewhere) attending the Radiation and Oncology Department of Government Medical College, Nagpur. ECOG performance score noted before starting treatment. Pre-treatment and 6 weeks' post-treatment quality of life score measured according to EORTC QLQ-C30 and EORTC QLQ-LC13 and compared. Treatment given was either chemotherapy, radiotherapy or chemo-radiotherapy according to standard guidelines.
Results: 79 patients received treatment and completed regular follow-up. The mean age of the patients was 56.06 years (SD±10.46). The number of male patients was 47, and the number of female patients was 32. The number of patients with ECOG scores 0, 1, 2, 3, and 4 was 3 (3.8%), 35 (44.3%), 24 (30.4%), 14 (17.7%), and 3 (3.8%), respectively. EORTC QLQ-C30 score pre- and post-treatment was 70.14 (±16.309) and 53.58 (±16.445), respectively ($p<0.001$).
Conclusions: QoL in lung cancer patients improves after chemotherapy, radiotherapy, or chemo-radiotherapy. EORTC is a simple and useful score system for comparing pre- and post-treatment QoL.

Keywords: Lung cancer, ECOG, EORTC, Quality of life

INTRODUCTION

Quality of life (QoL) is a very important determinant of cancer treatment and its outcome. Any cancer treatment, when tested, is tested not only for lengthening of survival and total cure but also for a better quality of life. Earlier studies have shown that disease-related symptoms and quality of life improve after chemo-radiotherapy, even if there was no measurable tumor response.[1-3]

The burden of lung cancer is increasing day by day in India, and it remains the most prevalent cancer since 1985.[4] Each year, approximately 63000 lung cancer cases are registered in India.[5] Lung cancer treatment has a major impact on QOL by improving social and mental health.[6,7]

Health-related QoL measures are well-validated questionnaires that gauge individuals' observation of their physical, mental, and social health grade, or aspects of their status resulting from cancer and its treatment.[8]

However, there is very limited data on the QoL of lung cancer patients in India. The present study assesses QOL response to chemo-radiation on the EORTC scale in lung cancer patients.

Aim and objectives

Aim and objectives of the study were to compare the quality of life on the EORTC scale in pre- and post-treatment of lung cancer patients undergoing chemotherapy, radiotherapy, or chemo-radiotherapy.

METHODS

The study was done in the Department of Radiation and Oncology, Government Medical College, Nagpur, from January 2017 to June 2018. It was an observational prospective study. Before commencing the study, approval was taken from the Institutional Ethics Committee and the Maharashtra University of Health Sciences, Nashik. All the participants were informed about the study, and consent was taken from each patient. Utmost importance was given to the counselling part and follow-up of treatment to reduce the attrition rate. Data was processed on software statistical package for the social sciences (SPSS) version 20. All newly diagnosed, biopsy-proven patients of lung cancer, treatment naïve patients attending the Radiotherapy department of Government Medical College, Nagpur, willing to sign an informed consent form, were included in the study. Already been diagnosed with lung cancer and had taken treatment elsewhere, and only fine needle aspiration cytology (FNAC) reports were excluded. Sampling was done by the purposive sampling method based on previous studies.

Study procedure

All patients underwent informed consent and detailed assessment of demographics, clinical history, risk factors, clinical examination, TNM staging, performance score, and quality of life assessment, followed by investigations and appropriate treatment according to the institute protocol. Performance status was measured by the European Cooperative and Oncology Group (ECOG) treatment.[8]

Quality of life was measured before and 6 weeks after completion of treatment according to European Organization for Research and Treatment of Cancer Quality of Life- C30 (EORTC QLQ-C30) and lung cancer specific EORTC quality of life - lung cancer 13 (EORTC QLQ-LC13) questionnaire in English, Hindi and Marathi according to preference of the subject.

Treatment was given according to cancer type, staging, ECOG performance score, and department protocols. Patients were divided into chemotherapy (CT), radiation therapy (RT), and chemo-radiotherapy (CT-RT).

RESULTS

98 patients with lung cancer were screened. Out of these, 88 patients became eligible for the study, of which 9 patients were lost to follow-up. 79 patients were treated and followed up regularly. The mean age of the patients was 56.06 years (SD±10.46) (Table 1). The number of male patients was 47, and the number of female patients was 32. The number of subjects in stages I, II, III, and IV was 0, 9 (11.4%), 19 (24.1%), and 51 (64.5%) (Table 2). The number of subjects diagnosed with adenocarcinoma, squamous cell carcinoma, and small cell carcinoma was 54, 24, and 1, respectively.

Table 1: Number and mean age of the subjects.

Variables	N
Total number of subjects	79 (male=47 and female=32)
Mean age	56.06 years (SD±10.46)

Table 2: Disease stage-wise distribution.

Stage	1	2	3	4
Number of subjects	0	9 (11.4%)	19 (24.1%)	51 (64.5%)

Risk factors associated with lung cancer found were home smoke 51.9%, passive smoking 45.6%, kerosene 40.50%, dust exposure 39.24%, smoking 32.9%, air pollution 26.6% and animal fat 12.65%. Other risk factors arsenic, nickel, asbestosis, mining, chloromethyl, soot/tar and lack of vegetables were absent.

Symptoms and signs found were cough 83.5%, breathlessness 74.7%, chest pain 54%, anorexia 43%, fever 26.6%, hoarseness of voice 20.3%, bone pain 16.5%, haemoptysis 15.2%, hemiplegia 7.6%, puffiness of face 6.3%, wheeze 5.1%, headache 5.1%, DVT 3.8%, stridor 2.5% and seizure 1.3% (Table 3).

ECOG score

Pre-treatment mean ECOG score was 1.74. Number of subjects with ECOG score 0, 1, 2, 3, and 4 were 3 (3.8%), 35 (44.3%), 24 (30.4%), 14 (17.7%), and 3 (3.8%), respectively (Table 4).

Quality of life

Mean EORTC QLQ-C30 score pre-treatment was 70.14 (±16.309) and post-treatment was 53.58 (±16.445). Mean EORTC QLQ-C30 score reduced significantly post-treatment, $p<0.001$ (Table 5) (Figure 1).

Mean EORTC QLQ-LC13 pre-treatment was 22.95 (±4.728), and post-treatment was 18.48 (±4.888). EORTC QLQ-LC13 score reduced significantly post-treatment, $p<0.001$ (Table 5).

Table 3: Symptom distribution of the subjects.

S. no.	Symptoms	Percentage of subjects	S. no.	Symptoms	Percentage of subjects
1	Cough	83.5	9	Hemiplegia	7.
2	Breathlessness	74.7	10	Puffiness of the face	6.3

Continued.

S. no.	Symptoms	Percentage of subjects	S. no.	Symptoms	Percentage of subjects
3	Chest pain	54	11	Wheeze	5.1
4	Anorexia	43	12	Headache	5.1
5	Fever	26.6	13	DVT	3.8
6	Hoarseness of voice	20.3	14	Strider	2.5
7	Bone pain	16.	15	Seizure	1.35
8	Haemoptysis	15.2			

Table 4: Performance score distribution of the subjects according to ECOG criteria.

ECOG score	0	1	2	3	4
Number of subjects	3 (3.8%)	35 (44.3%)	24 (30.4%)	14 (17.7%)	3 (3.8%)

Table 5: Comparison of quality of life before and after treatment according to EORTC score.

QOL score	Pre-treatment	Post-treatment	P value
EORTC QLQ-C30	70.14 (±16.309)	53.58 (±16.445)	<0.001
EORTC QLQ-LC13	22.95 (±4.728)	18.48 (±4.888)	<0.001

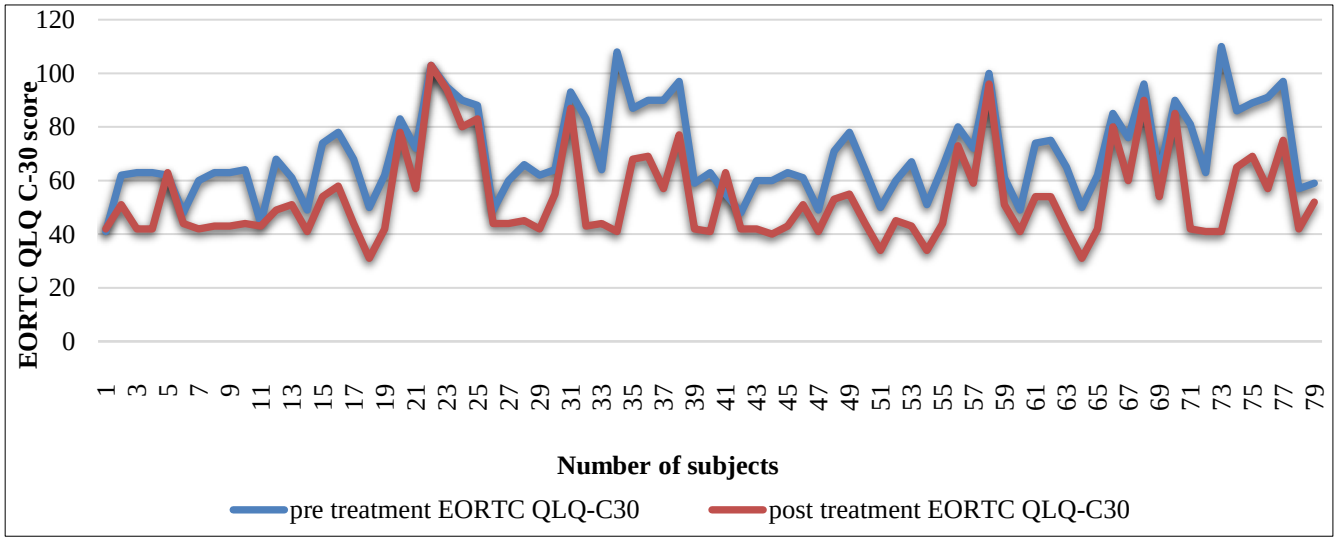

Figure 1: Frequency polygon showing comparison of EORTC QLQ-C30 score pre- and post-treatment.

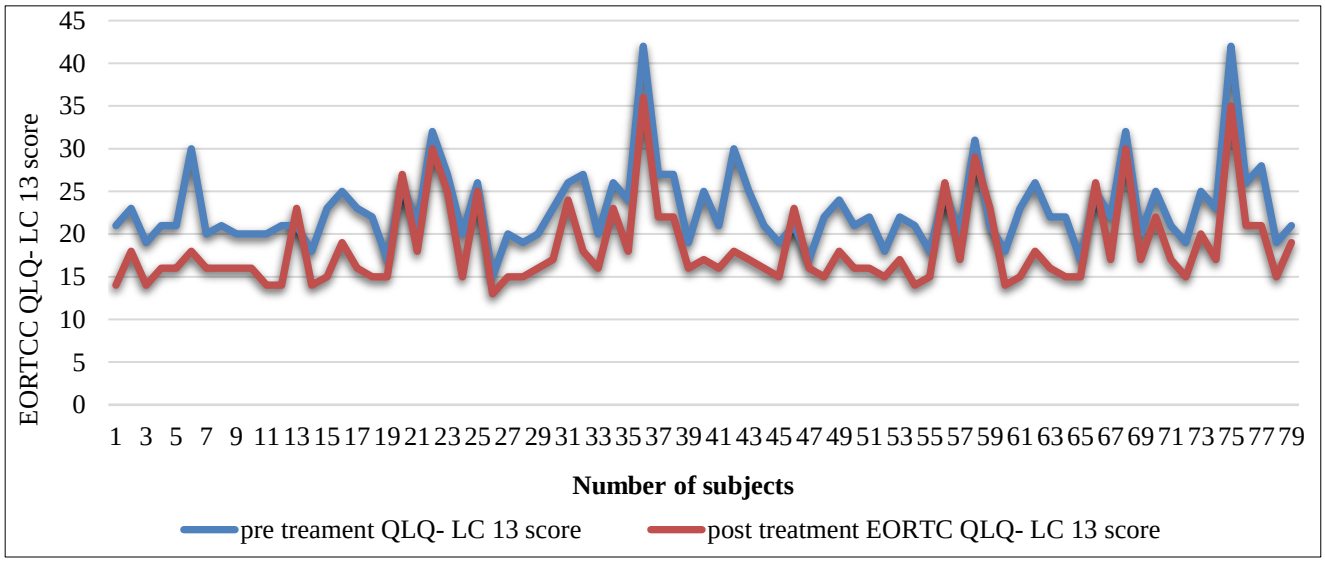

Figure 2: Frequency polygon showing comparison of EORTC QLQ-LC13 score pre- and post-treatment.

DISCUSSION

Age and sex

In this study, the mean age of the lung cancer patients was 56.06±10.46 years. The maximum number of lung cancer patients was in the 61 to 70-year age group. Male to female=1.5:1. In a study in North India by Singh et al, mean age was 57.9 [±11.3] years and male to female ratio was 4.:1.[11] At AIIMS, Malik et al found that median age was 55 years with a male: female ratio of 4.6:1.[12] As compared to previous studies a lesser male to female ratio was found in the present study.

Type of malignancy

In our study, most of the subjects were having adenocarcinoma 68.35% (n=54) followed by squamous cell carcinoma 30.4% (n=24) and small cell carcinoma 1.26% (n=1).

In a study by Noronha et al, 8% of patients had small-cell carcinoma (SCLC) and 92% had non-small cell carcinoma. Out of 92% of patients with non-small-cell carcinoma (NSCLC), the most common histology was adenocarcinoma (43.8%), followed by squamous cell carcinoma (26.2%), large cell carcinoma (2.1%), and other (8.3%).[13] In a study by Malik et al, there were 85.3% NSCLC and 14.7% SCLC cases. Among NSCLCs, adenocarcinoma 45.41% was the commonest type, followed by squamous cell carcinoma 29.46% and large cell 1.9%.[12] Our study matches some previous studies in terms of the most common lung cancer type as adenocarcinoma, while some studies state that squamous cell carcinoma is the most common. However, the percentage of small cell carcinoma in our study is very less, only 1.26%.

Stage of disease

64.5% (n=51) subjects were diagnosed in stage IV, 24.1% (n=19) in stage III and 11.4% (n=9) in stage II. This finding matches with the previous Indian studies.

In a study by Malik et al, among NSCLC, 56.75% of patients were of stage IV. The early-stage (I-IIIA) was present in only 24.99% of the patients. The remaining 54 (14.59%) patients had stage IIIB disease.[12]

In a review by Behera et al, 75-80% of all lung cancers are occupied by non-small cell lung cancer. More than 70 % of lung cancer patients are diagnosed in stages III and IV.[14]

Thus, like other studies in India, our study also showed that lung cancer patients in central India present in the advanced stages of the disease.

Symptoms

In our study most common symptoms were cough 83.5%, breathlessness 74.7%, chest pain 54% and anorexia 43%. Other symptoms and signs were fever 26.6%, pleural effusion 26.6%, fever 26.6%, hoarseness of voice 20.3%, bone pain 16.5%, haemoptysis 15.2%, hemiplegia 7.6%, puffiness of face 6.3%, wheeze 5.1%, headache 5.1%, DVT 3.8%, stridor 2.5% and seizure 1.3%.

In a study by Jindal et al common symptoms were cough in 88%, chest pain 52.2%, loss of weight 90%, breathlessness was not reported, generalised weakness in 90%, haemoptysis 69.2%, fever 19.6%, anorexia 90%, hoarseness of voice 29.9%, nausea and vomiting 6%, puffiness of face 19.8%, dysphagia 20.8 and others 30.5%.[15]

In a review by Ganie, et al, less than 5% of patients were asymptomatic in initial stage of disease, cough 70-90%, haemoptysis 25-40%, dyspnoea 58%, wheezing 2-10% and other common symptoms were chest pain, weight loss, hoarseness of voice, phrenic nerve palsy, dysphagia, stridor, superior vena cava syndrome, pleural effusion 15-20%, pericardial effusion 5-10%.[16]

Thus, our study matches more or less with other previous studies in terms of symptoms.

Quality of life score

In the present study, both the mean EORTC QLQ-C30 score and EORTC QLQ-LC13 reduced significantly after treatment, $p<0.001$. Thus, the quality of life improved significantly as the symptoms were reduced after taking treatment.

Hechtner et al collected data from NSCLC patients who had survived 1 year or longer after diagnosis and were collected cross-sectionally in a multicentre study. QoL assessment was done with the EORTC-QLQ-C30 and EORTC-QLQ-LC13. 657 NSCLC patients participated in the study. Compared to the age- and sex-standardized general population, clinically meaningful differences in the QoL detriment were found on almost all domains. Whereas in 12 months or longer treatment-free patients, this detriment was small (8.3), it was higher in patients currently in treatment (16.0).[9]

Słowik-Gabryelska et al had shown that chemotherapy in most patients improved the performance status and minimized cancer symptoms in advanced non-small cell lung cancer.[10] However, the scale used was the lung cancer symptom scale.

In the literature, there is no direct comparison of the mean EORTC-QLQ C-30 and EORTC-QLQ-LC13 scores before and after treatment in lung cancer. The present study signifies that mean EORTC scores reduce after current chemotherapy, radiotherapy, or chemo-radiotherapy, and present treatment regimens have a positive effect on quality of life and reduce the symptom burdens in lung cancer patients. Thus, large prospective

studies are required to directly evaluate the quality of life according to the EORTC scale.

Limitations

The present study was done at a single centre. Due to a shortfall in the inflow of lung cancer patients, the study utilized a small sample size, which limited generalizability but allowed for in-depth analysis. Long-term follow-up is needed to assess the quality of life during the treatment-related late-occurring reactions.

CONCLUSION

Lung cancer treatment, either chemotherapy, radiation therapy, or chemo-radiotherapy, has a significant positive effect on the improvement of quality of life in lung cancer patients.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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