



Factors Predicting Response to Chemotherapy in Advanced Non-Small Cell Carcinoma Lung: A Case Study

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Keywords

Advanced; Non-Small Cell Carcinoma lung; Factors; Chemotherapy

Introduction

Lung cancer is the most prevalent cancer both among females and males. It has the highest cancer-related mortality rates worldwide [1]. In India, lung cancer constitutes 6.9% of all new cancer cases and 9.3% of all cancer related deaths in both sexes. Non-Small Cell Lung Cancer (NSCLC) accounts for more than 80% of primary lung cancers and out of these, approximately two-thirds patients present in the advanced-stage (Stage III and IV of 7th TNM staging) at diagnosis [2]. There is a scarcity of data on the prognostic markers of response to chemotherapy from our geographical area. It is known that lung cancer behavior differs between different geographical areas and ethnicities [3]. Hence, we plan to conduct a study to evaluate different prognostic factors that may predict response to 4 cycles of chemotherapy with or without radiotherapy in advanced lung cancer patients.

Aims and Objectives

1. To evaluate the prognostic factor predicting response to chemotherapy with or without radiotherapy in advanced non-small cell carcinoma lung.
2. To evaluate treatment response in advanced non-small cell lung cancer patients.

Materials and Methods

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The study will be conducted in the Department of Pulmonary Medicine in collaboration with the Department of Radiotherapy and Oncology, All India Institute of Medical Sciences Rishikesh, Uttarakhand, India.

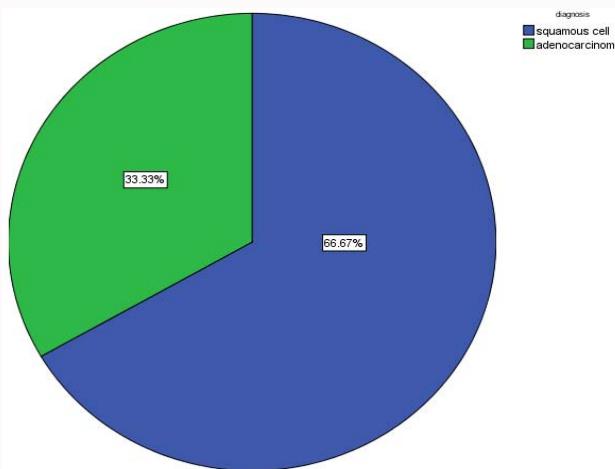
Inclusion criteria

1. Non-small cell lung cancer cases confirmed on histopathology/cytopathology and planned for palliative chemotherapy with or without radiotherapy.
2. Patients with Eastern Cooperative Oncology Group (ECOG) performance status of 0-2 [4].

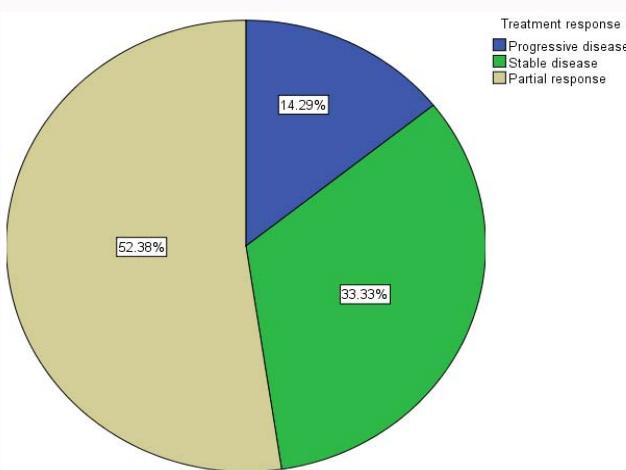
Exclusion criteria

1. Unfit for chemotherapy due to unstable coronary artery disease, recent myocardial infarction (last 6 weeks), and congestive heart failure.
2. Patient not willing for treatment.
3. Patient with ECOG 3.

The study is a cohort study in which 30 confirmed cases of advanced (clinical stage IIIB and IV) non-small cell lung cancer will be enrolled. All subjects have been given information about the study and written informed consent was taken. They were subjected to detailed history and clinical examination especially smoking history, previous TB, co-morbidities and performance status and baseline tumour burden was calculated by CT based tumor size measurement according to revised RECIST 1.1. Routine blood investigations, spirometry and arterial blood gas analysis and exercise capacity using 6-Minute walk test was done. All patients were given 4 cycles of palliative chemotherapy with or without radiotherapy as per indication. Reassessment was done after 4 cycles of chemotherapy in terms of tumor size, spirometry including diffusion capacity, arterial blood gas analysis, mMRC dyspnea grade and six-minute walk test. Univariate and multivariate analysis was done to find out prognostic factors which predict response after 4 cycles of chemotherapy (Pie



Pie Diagram 1: The distribution of non-small cell lung cancer patients.



Pie Diagram 2: The distribution of response to treatment as per RECIST criteria.

Table 1: Baseline characteristics of Non-small cell lung cancer patients.

S. No	Parameter	Value
1	Age (yrs)	58 ± 10.6 years
2	Gender (M:F)	4:1
3	Breathlessness (%)	18 (85)
4	Previous history of TB (%)	4 (19)
5	Diabetes (%)	1 (4.8)
6	Smokers (%)	16 (76)
7	BMI	20.8 ± 3.02
8	Hemoglobin (gm/dl)	10.6 ± 2.8
9	S. Sodium	137 ± 5.0
10	S. Uric acid	6.3 ± 3.3
11	S. calcium	9.7 ± 1.2
12	S. Alkaline phosphatase	109.5 ± 27.06
13	S. Lactate dehydrogenase	581.8 ± 216.7
14	S. albumin	3.3 ± 0.57

Continuous variable is written as mean ± SD and categorical variables as n (%)

Diagram 1, 2 and Table 1).

Results

The mean age of patients was 58+10.6 years. Male outnumber females (M: F=4:1). Eleven patients showed partial response after

4 cycles of chemotherapy whereas 3 had disease progression as per RECIST criteria. On multivariate logistic regression analysis, Alkaline Phosphatase (ALP) was the only factor found to have independent association with response to chemotherapy (adjusted Odds ratio: 1.1; 95% confidence interval: 1.007-1.20; p=0.03).

Conclusion

Alkaline Phosphatase (ALP) was the only factor found to have independent association with response to chemotherapy advanced NSCLC treated with chemotherapy. The identification of prognostic factors can be useful for the correct choice of patients and treatment in clinical practice. Knowledge of prognostic factors might guide in better monitoring of patients with poor prognostic factors and can serve as a basis for future research to evaluate the causes of poor response.

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