

**Keywords:** Squamous-adenocarcinoma; Dyspnea; Chemotherapy; Chest pain; Dysphagia

## Introduction

Carcinoma of the lung forms 5.6% of patients presenting with cancer at the Tata Memorial hospital in India and 65% of these have advanced stages of disease [1]. Seventy percent of the patients receiving radiation therapy have stage III or IV disease. Treatment with radiotherapy alone has an extremely poor outlook in patients with lung cancer, with only 5% of patients surviving for 5 years [2-4].

A number of randomized clinical trials have compared different fractionation schedules in the palliation of thoracic symptoms [5 -14]. Only one of these studies [9] compared single fraction radiotherapy of 10 Gy with two fractions of 8.5 Gy each one week apart. Five studies have compared two fractions of 8.5 Gy radiotherapy with more protracted schedules (30 Gy in 10 fractions or 27 Gy in 6 fractions [8], 36 or 39 Gy in 12 or 13 fractions [10] and 22.5 Gy in 5 fractions [11], 21.5 Gy in 5 fractions of 4.25 Gy given over 2 days [15] and 42 Gy in 15 fractions daily as well as 50 Gy in 25 fractions daily [16]). The most commonly used regimen in the USA for palliative treatment has been 30 Gy in 10 fractions within 2-3 weeks.

The effectiveness of radiotherapy in palliating pulmonary symptoms due to non-small cell lung cancer (NSCLC) ranges from 50-90% [6-11,15,17-19]. In general, hemoptysis has the highest response rate (76-95%), followed by chest pain (50-80%), cough (50-65%) and dysphagia (37-60%). The optimal schedule for palliation of these symptoms has not been determined.

Citation: Sharma V, Sanghavi V, Agarwal JP, Deshpande R, Levin CV, et al. (2012) Single Institution Prospective Randomized Trial of Radiation as a Sole Modality in Palliation of Advanced Non-small Cell Lung Cancer-an International Atomic Energy Agency Study.

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Parameters	Number	\ HDU V X U Y L Y D O	Multivariate
Age group	37	11	0.03
	60	8	
KPS	22	4.5	0.09
	60	10	
Fraction	20	5	0.01
	20	0	
	20	20	
Stage	24	8	0.57
	36	5	
Metastases	30	13	0.98
	30	7	
Endo-bronchial lesion	36	8	0.84
	24	8	
Sex	53	5	0.08
	7	0	
Histology	25	12	0.18
	25	8	
	10	0	

Table 5: Parameters versus survival.

Parameters	\ U 6 X U Y L Y D O			Univariate P value
	1 Fraction	2 Fractions	5 Fractions	
KPS	0	0	12.5	0.73
	9	0	25	0.09
Stage	25	0	17	0.51
	0	0	25	0.11
Metastases	0	0	37.5	0.01
	14	0	8	0.29
Endo-bronchial lesion	0	0	8(13mths)	0.29
	0	0	14	0.07
Sex	5.5	0	23	0.07
	0	0	0	0.82

Table 6: Prognostic factors versus fractionation.

fraction of 10 Gy provided relief in 87.5% patients as against 62.5% Most studies have reported relief of hemoptysis ranging from 60-80% noted by two fractions of 8.5 Gy each one week apart. In contrast, 100% using different radiation regimens [5, 8,9,15,20,26]. In the present study, 83-86% of patients had relief of hemoptysis when treated with 3 dose schedules. Rees et al. [11] have reported a higher rate of relief of hemoptysis in comparison to other symptoms.

Relief in chest pain was reported by various groups [5,8,9,26,29,30] ranging from 44-83%. Seventy-five percent of patients had pain relief with five fractions of 4 Gy each delivered daily in comparison to 64% patients with two fractions of 8.5 Gy each one week apart in the present series. The relief was significantly higher for patients who had at least a partial response but the addition of boost radiation in the present study did not improve pain relief further as has been reported by Donato et al. [31]. The 10 fraction schedule reported by Erridge et al. [21] resulted in a significant reduction of chest pain (p=0.004) in comparison to a single fraction of 10 Gy in a study of 149 patients. Teo et al. [7] have noted significantly better palliation of 71% with 45 Gy in 18 fractions as compared to 51% with 31.2 Gy in 4 fractions given once weekly (p=0.02). Bezdek et al. [28] have reported the results of multi-institutional trial comparing 10 Gy single fraction radiotherapy with 20 Gy in 5 fractions in the palliation of thoracic symptoms from lung cancer. The fractionated radiotherapy group had a greater overall improvement in symptoms related to lung cancer (p=0.009) and pain (p=0.0008). There was no difference between symptom relief in the 3 arms in our study and similar results have also been reported by three MRC trials [8-10].

Dyspnea improvement was noted in 30-97% patients depending on the rates of palliation for hemoptysis, chest pain, cough and on different schedules [5,8,13,20,29,31]. In the present study, dyspnea was improved in 36-65% of patients. The 10 fraction schedule reported by Erridge et al. [21] resulted in better palliation of dyspnea than single treatment. The biological effect of radiation on tumors is increased as the overall treatment is shortened [33].





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