



Palliative thoracic radiotherapy for patients with advanced non-small cell lung cancer and poor performance status



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ABSTRACT

Objective: The evaluation of efficacy of palliative thoracic radiotherapy (PTR) in patients with advanced non-small cell lung cancer (NSCLC) and to compare it with efficacy of supportive care (SC) alone.

Materials and methods: Between 2000 and 2012, 235 patients with advanced NSCLC (IIIB and IV) and Karnofsky Performance Status accounted 40–30, were qualified to PTR. In fact, 125 (53.2%) out of them were treated with PTR, and 110 (46.8%)—with SC alone, in accordance with patients expectations. There were no differences between PTR and SC group with respect to patient and tumor characteristics as well as with respect to the type and incidence of symptoms related to the local growth of NSCLC. In all 125 PTR patients the delivered tumor dose was 20 Gy given in five daily fractions over five treatment days. All 110 patients who refused PTR were treated with SC in another hospital (28.2%), in a hospice (21.8%) or by general practitioners at home (50.0%).

Results: The 90-day overall survival rate in the group of PTR patients was 20.0%, and in the group of SC patients it was 18.2%. Median survival amounted 58 and 59 days, respectively. The efficacy of PTR and SC, relative to the symptoms associated with the local growth of NSCLC, was comparable. Tolerance of PTR was poor and early toxicity—significant. Moreover 41.6% of irradiated patients received PTR within the last 30 days of their lives and 16.0% of these patients—within the last 15 days prior to death.

Conclusion: The life expectancy of patients with advanced NSCLC and poor performance status (Karnofsky 40–30), who presenting moderate or severe symptoms related to the local growth of cancer, is measured in days or weeks. The effective method of treatment for these patients is modern supportive care rather than PTR.

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1. Introduction

Palliative thoracic radiotherapy (PTR) has an established role in the treatment of patients with locally advanced or metastatic non-small cell lung cancer (NSCLC), not amenable to radical treatment. PTR is an effective tool to relieve symptoms associated with growth of NSCLC in the chest, and therefore improves patient's quality of life and possibly prolong survival [1–12]. Optimal schedules of PTR

in patients with advanced NSCLC have not yet been established [1–3,6,12–14].

Some studies suggest that schedules of longer fractionation and higher doses should be considered for patients with good performance status (PS) and longer of life expectancy [1,2,6,15–19]. To the contrary, in patients with a poor PS and short expected survival time, hypofractionated short-course PTR is used most frequently [1,3–6,11,14–17,20–23]. In terms of relief of symptoms associated with locally growth of NSCLC, shorter courses of PTR are as effective as more protracted regimens [1,4,5,11,14–17,23–26].

However some patients with advanced NSCLC referred to PTR have a poor PS and limited life expectancy. In these patients, the question whether to offer radiotherapy or not should be

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considered rather than the issue of fractionation schedule. The main factors that influence this decision are: performance status, estimated prognosis, symptom severity and patient's choice [1,3,10,13,14,18,19,27,28].

The purpose of our study is evaluation of efficacy of PTR in terminally ill patients with advanced NSCLC and compare it with the efficacy of supportive care alone.

2. Material and methods

Between 2000 and 2012, a total of 2520 patients with histologically or cytologically confirmed NSCLC were seen at the Department of Radiation Oncology in the Centre of Oncology, Cracow. Out of this population, 1010 (40.1%) patients with locally advanced or metastatic disease were qualified to PTR; 235 (23.3%) out of them had Karnofsky Performance Status (KPS) under 50, and this group of patients was analyzed carefully, because in numerous studies KPS has emerged as a potent survival predictor in advanced stage cancer patients [1,3,10,29–31].

Diagnostic procedures in these patients included clinical examination, bronchoscopy with biopsy, chest X-ray (PA and lateral views), chest CTs, complete blood count, blood biochemistry and abdominal ultrasound in all patients. Cerebral CT/MRI examination or bone scans were performed if indicated due to the symptoms present. Respiratory function was estimated with spiro- and gasometry.

In the analyzed group of 235 patients, 125 (53.2%) were treated with PTR and 110 (46.8%) with supportive care (SC) alone. The decision whether to undergo radiotherapy or not was up to the patient or the patient and his/her relatives. Before this decision, two physicians of our Department discussed with patients risks and benefits of both treatment methods. The characteristics of all these patients are shown in Table 1.

The studied group of 235 patients consisted of 42 (17.9%) females and 193 (82.1%) males. Patient's age ranged from 35 to 75 years, with mean age of 64 years. Squamous cell carcinoma was found in 164 (69.8%), adenocarcinoma in 64 (27.2%) and large-cell

carcinoma in 7 (3.0%) patients. The patients were retrospectively staged according to the American Joint Committee on Cancer (AJCC) 2010 staging system [32]. Stage IIIB and IV of NSCLC were found in 137 (58.3%) and 98 (41.7%) patients, respectively. A total of 98 (41.7%) patients had metastatic disease, affecting: lung (24 pts), jugular lymph nodes (24 pts), adrenal gland (22 pts), liver (20 pts), abdominal lymph nodes (10 pts), bone (8 pts), and spleen (2 pts). Patients with brain metastases, diagnosed before the treatment in our Center, were excluded from this study. The value of KPS was 40 (186 pts—79.1%) or 30 (49 pts—20.9%). Comorbidities presented at the beginning of treatment were assessed with use of lung cancer specific simplified comorbidity score (SCS) [33]. The median value of SCS was 12 (range 8–19) and in 112 (47.7%) patients it accounted over 12. All patients developed weight loss over 10% before treatment. The data in Table 1 show that groups (PTR and SC) were clinically similar.

In all patients before treatment the assessment of symptoms was made by a physician from our Department. A four-degree scale (none, mild, moderate and severe) was established for each of the main symptoms: cough, haemoptysis, thoracic pain and hoarseness [34]. For dyspnoea, the scale was as follows: none – the patient walks without dyspnoea, mild – the patient walks with mild dyspnoea, moderate – dyspnoea on walking a short distance and, severe – dyspnoea on mild exertion. For dysphagia, the scale was as follows: none – the patient can swallow without difficulty, mild – the patient can swallow solids with difficulty, moderate – the patient cannot swallow solids, and severe – the patient cannot swallow liquids. Table 2 show the frequency of disease-related symptoms.

The most common symptom was cough, reported by 111 (47.2%) patients, followed by: haemoptysis (80 pts—34.0%), thoracic pain (68 pts—28.9%), dyspnoea (57 pts—24.3%), hoarseness (24 pts—10.2%) and dysphagia (19 pts—8.1%). Patients with specific severe symptoms caused by tumor progression in the chest, such as: superior vena cava obstruction syndrome, Pancoast syndrome, and progressive acute obstruction of the main bronchus or trachea, were excluded from the study group. The frequency of symptoms was similar in both treatment groups: PTR and SC.

Table 1
The characteristics of 235 patients with advanced NSCLC.

Patient and tumor characteristics	Treatment groups		Total analyzed group			
	PTR*		SC**			
	No. of patients	%	No. of patients	%	No. of patients	%
Gender						
Females	22	17.6	20	18.2	42	17.9
Males	103	82.4	90	81.8	193	82.1
Age						
≤60	52	41.6	46	41.8	98	41.7
>60	73	58.4	64	58.2	137	58.3
Histology of lung cancer						
Squamous cell carcinoma	87	69.6	77	70.0	164	69.8
Adenocarcinoma	34	27.2	30	27.3	64	27.2
Large-cell carcinoma	4	3.2	3	2.7	7	3.0
Stage (AJCC 2010)						
IIIB°	73	58.4	64	58.2	137	58.3
IV°	52	41.6	46	41.8	98	41.7
Performance Status (Karnofsky's scale)						
40	100	80.0	86	78.2	186	79.1
30	25	20.0	24	21.8	49	20.9
SCS (simplified comorbidity score)						
≤12	65	52.0	58	52.7	123	52.3
>12	60	48.0	52	47.3	112	47.7
Total	125	100	110	100.0	235	100.0

* PTR—palliative thoracic radiotherapy.

** SC—supportive care.

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