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Effectiveness of palliative radiotherapy in patients with non-small cell lung cancer

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Introduction. Lung cancer is the most frequent malignant neoplasm in Poland. During the last 25 years it has become the first reason of death of men and the second of women in Poland. Patients with non-small cell lung cancer constitute 75% of all lung cancer patients. The therapy of choice for the advanced, non-small cell lung cancer is radiotherapy with palliative assumption. Many papers indicate that this therapy has no influence on long-term survival, hence it is aimed at reducing the symptoms. The therapy brings relief to 70-80% of patients. At present no other method with similar effectiveness is known. The aim of the is study was to assess the effectiveness of palliative radiotherapy as a treatment of the advanced, non-small cell lung cancer, applied as a remedy for the symptoms resulting from the growth of a lung tumour. Improvement of the quality of life and long-term survivals were assessed and prognostic factors were analysed.
Material. Between 1990 and 1995, 2330 patients with lung cancer attended the Outpatient Clinic of the Maria Skłodowska-Curie Memorial Cancer Center in Warsaw. There were 1948 patients with the non-small cell lung cancer. From this group 832 patients were qualified to palliative radiotherapy that included the primary tumour. The documentation was found for 803 patients and this group was analysed. The group constituted of 115 women (14.3%) and 688 men (85.7%), aged 28 to 91 (mean 61). In the majority of cases a significant advancement of the disease was found: stage III A in 388 patients (48.3%) and stage III B in 358 patients (44.6%).
Statistical methods. Retrospective analysis of the results of the treatment was carried out. The material contained information on 803 patients. The basis for the analysis was the survival time. It was measured from the starting date of the irradiation to the date of death or the date of the last available information that the patient lives. The survival probability was calculated with the Kaplan-Meier method. Multidimensional analysis of the relation of the results of the treatment to the overall state, occurrence of the coexisting diseases, type of the symptoms, previous chemotherapy and histopathological type of the neoplasm was carried out, using the D.R. Cox proportional risk model. The effectiveness of various dose fractionation methods were analysed in relation to the improvement. Significance of the differences in this analysis was tested with the logit model.
Results. The 12-month survival was 25%±1.5% and the 24-month one was 8%±1% (median: 6 months). In the survival analysis the following factors had an influence on the results:overall performance status – $p=0.00001$, superior vena cava syndrome – $p=0.00001$, dyspnoea – $p=0.0001$, dysphagia – $p=0.0016$, pain – $p=0.01$, extensive form of the disease – $p=0.03$. On the average 75.3% of the patients observed a reduction of the symptoms, from 60.7% to 91.7%.
Conclusion. Palliative radiotherapy in patients with the advanced, non-small cell lung cancer improves the guality of life in around 75% of cases. The largest improvement in observed in the group of patients qualified to the treatment because of haemoptysis, dyspnoea, dzsphagia and pain in the chest. The presence of the superior vena cava syndrome has a largest negative influence on the prognosis. The most significant prognostic factor in the qualification of the patients with the advanced, non-small cell lung cancer to the palliative treatment is their performance status.

Ocena skuteczności paliatywnego napromieniania śródpiersia chorych na niedrobnokomórkowego raka płuca

Wstęp. Rak płuca jest najczęstszym nowotworem złośliwym u człowieka. W Polsce w ciągu ostatniego ćwierćwiecza stał się pierwszą u mężczyzn i drugą u kobiet przyczyną zgonów. Chorzy z rozpoznaniem niedrobnokomórkowego raka płuca stanowią około 75% wszystkich chorych na raka płuca. Rocznie w Polsce rozpoznajemy go u około 16 000 chorych. W tej grupie ponad 70% osób, zgłaszających się po raz pierwszy, jest zdyskwalifikowanych od leczenia operacyjnego i radykalnej radiote-

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rapii z powodu zaawansowania choroby. U zdecydowanej większości z nich stwierdza się ciężkie objawy ze strony guza w klatce piersiowej. Tylko 30% chorych z tej grupy nie zgłasza w chwili rozpoznania żadnych dolegliwości. Metodą leczenia z wyboru chorych na zaawansowanego, niedrobnokomórkowego raka płuca jest radioterapia o założeniu paliatywnym. Celem jej jest zmniejszenie dolegliwości, gdyż wiele prac wskazuje, że nie ma ona wpływu na przeżycia odległe. Zastosowane leczenie przynosi poprawę u 70-80% chorych. Aktualnie nie jest znana jakakolwiek inna metoda o podobnej skuteczności.
Cel pracy. Celem pracy była próba oceny skuteczności paliatywnej radioterapii w leczeniu zaawansowanego, niedrobnokomórkowego raka płuca, stosowanej z powodu dolegliwości wynikających ze wzrostu guza w klatce piersiowej. Oceniono poprawę jakości życia chorych i przeżycia odległe. Przeprowadzono analizę czynników prognostycznych.
Materiał. W okresie od 1 stycznia 1990 r. do 31 grudnia 1995 r. do Ambulatorium Centrum Onkologii-Insytutu przy ul. Roentgena 5 w Warszawie zgłosiło się 2330 chorych na raka płuca, w tym 1948 chorych na niedrobnokomórkowego raka płuca. W tej grupie do paliatywnego leczenia napromienianiem, obejmującego guz pierwotny, zakwalifikowano 832 chorych. Do niniejszej pracy odnaleziono dokumentację dla 803 chorych i tę grupę poddano analizie. Było w niej 115 kobiet (14,3%) i 688 mężczyzn (85,7%), w wieku od 28 do 91 lat (średnia 61 lat). W większości przypadków stwierdzano znaczne zaawansowanie procesu nowotworowego: stopień III A ustalono u 388 chorych (48,3%), a stopień III B u 358 chorych (44,6%).
Metody statystyczne. Przeprowadzono retrospektywną analizę wyników leczenia. Materiał obejmował informacje o 803 chorych. Podstawą oceny wyników był czas przeżycia. Czas przeżycia liczono od daty rozpoczęcia napromieniania do daty zgonu lub ostatniej informacji o tym, że chory żyje. Prawdopodobieństwo przeżycia obliczano metodą Kaplana-Meiera. Przeprowadzono wielowymiarową analizę zależności wyników leczenia od stanu ogólnego chorego, występowania chorób współistniejących, rodzaju zgłaszanych dolegliwości, uprzedniej chemioterapii i typu histopatologicznego nowotworu, używając modelu proporcjonalnego ryzyka D.R. Coxa. Analizowano skuteczność różnych sposobów frakcjonowania dawki w aspekcie wystąpienia poprawy. Istotność różnic w tej analizie testowano przy pomocy modelu logitowego.
Wyniki. Przeżycie 12 miesięcy wyniosło 25%±1,5%, a 24 miesięcy 8%±1% (mediana: 6 miesięcy). W analizie przeżyć następujące parametry miały wpływ na uzyskane wyniki: stan ogólny – p=0.00001, zespół żyły głównej górnej – p=0.00001, duszność – p=0.0001, dysfagia – p=0.0016, ból – p=0.01, postać rozległa choroby – p=0.03.
Średnio 75.3% chorych obserwowało zmniejszenie dolegliwości, od 60.7% do 91.7%.
Wnioski. Radioterapia paliatywna u chorych z zawansowanym, niedrobnokomórkowym rakiem płuca przynosi poprawę jakości życia średio w 75% przypadków. Największa poprawa obserwowana jest w grupie chorych, kwalifikowanych do leczenia z powodu krwioplucia, duszności, dysfagii i bulów w klatce piersiowej. Fakt wystąpienia zespołu żyły głównej górnej w sposób naistotniejszy pogarsza rokowanie. Najistotniejszym czynnikiem rokowniczym w kwalifikacji do leczenia paliatywnego chorych z zaawansowanym, niedrognokomórkowym rakiem płuca jest stopień sprawności chorego.

Key words: palliative radiotherapy, quality of life improvement, non-small cell lung cancer
Słowa kluczowe: paliatywna radioterapia, poprawa komfortu przeżycia, niedrobnokomórkowy rak płuca

Introduction

Lung cancer is the most frequent malignant neoplasm in man. Its occurrence is strictly related to the exposition to tobacco smoke, which is a carcinogenic factor. The risk of cancer is 10-30 times larger in the smokers than in the non-smokers group. Passive smoking has also a negative influence, and this influence is larger the younger the exposed person is [1]. In Poland during the last 25 years, lung cancer became the first reason of death in men and the second one in women [2]. Between 1968 and 2000 the number of deaths due to lung cancer increased in men from 18.3% to 34.3% and in women from 3.9% to 8.6% [2].

The results of treatment are still bad, which results directly from that at the time of disclosure the advancement of the disease is significant. Non-specific clinical symptoms – cough, chronic pneumonia and fever in a smoker still do not lead to a suspicion of developing cancer.

Around 75% of all lung cancer patients have the non-small cell cancer. In this group over 70% are disqualified from surgery and radical radiotherapy due to the advancement of the disease [3]. Majority of these patients have severe clinical symptoms resulting from the presence of a tumour in the chest. Only 30% do not declare any symptoms at the time of diagnosis. These patients are a subject of a long-lasting discussion on the purposefulness of oncological therapy [4-8].

The method of choice for patients with advanced, non-small cell lung cancer is radiotherapy with the palliative assuumption. It is aimed at reduction of symptoms. Many papers indicate that it has no influence on the long-term survival [9-11]. The applied treatment brings improvement in 70-80% of the patients [3, 4, 7, 8, 13]. No other method with a similar effectiveness is known at present.

The aim of the study

The aim of the study was to assess the effectiveness of the palliative radiotherapy applied due to symptoms resulting from the growth of a tumour in chest to patients with advanced, non-small cell lung cancer. The improvement of the quality of life and the long-term survival were assessed in relation to the overall state of the patient, presen-

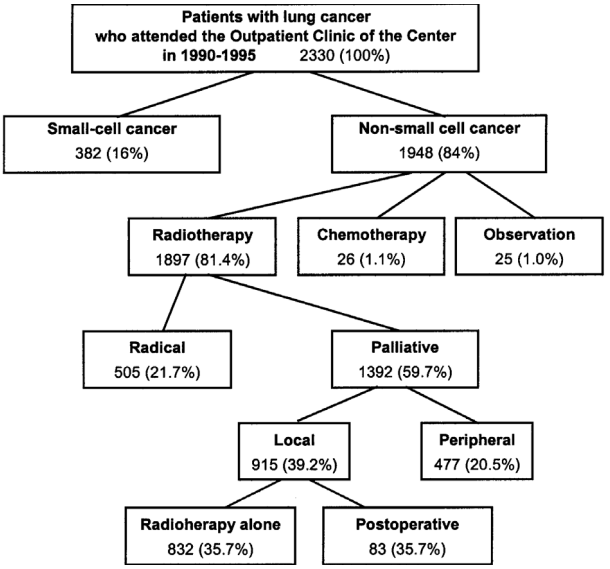

Fig. 1. Therapy in the group of 2330 patients examined for the first time between 1.01.1990 and 31.12.1995

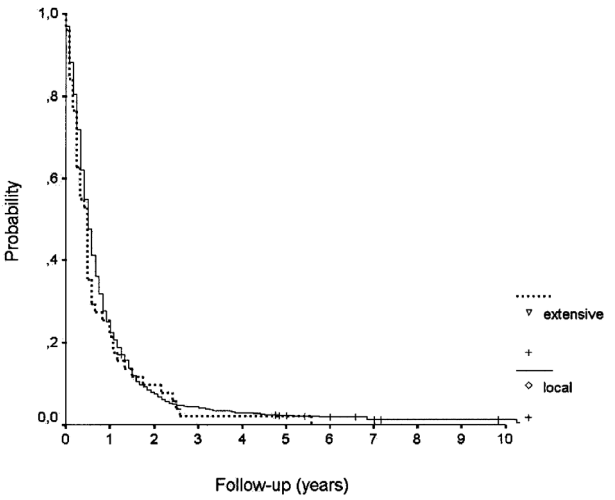

Fig. 2. Survival probability of patients irradiated palliatively to mediastinum because of an advanced, non-small cell lung cancer, in the group of patients with the localised disease (750 patients) and in the group with the spread disease (53 patients)

ce of accompanying diseases, microscopic form of the cancer, application of the previous neoadjuvant chemotherapy and in relation to some other symptoms the most frequently reported by the patients.

Material

Between January 1, 1990 and December 31, 1995, 2330 patients with lung cancer attended the Outpatient Clinic of the Maria Skłodowska-Curie Memorial Cancer Center in Warsaw. Among them there were 1948 patients with the non-small cell lung cancer. After clinical investigation and additional diagnostic tests, 832 patients from this group were qualified to palliative radiotherapy, which included the primary tumour (Fig. 1). For the present study the documentation of 803 patients was found, and this group was analysed. The group constituted of 115 women (14.3%) and 688 men (85.7%), aged from 28 to 91 (mean 61). All patients underwent physical examinations, radiological investigation of chest with barite pulp in the oesophagus, bronchoscopy, routine biochemical blood tests, urine analysis, in a majority – ultrasound abdomen tests, and in 26% – computed tomography of the chest.

Squamous cell carcinoma was diagnosed in 70% of the patients, adenocarcinoma in 12.3%, large cell cancer in 6.2% and non-small cell cancer without a precise classification of its type in 8.6%. The diagnosis was not established in 2.9%.

The clinical advancement stage was assessed according to the TNM classification. The advancement of the process is shown in Tab. I. Severe advancement was diagnosed in a majority of cases. Symptoms of spread out from the chest were found in 21 patients (2.6%). Two patients had metastases to bones, 14 – to the supraclavicular lymph nodes, and 2 – to the suprarenal glands. The features of a second, coexisting neoplasm were found in 32 (4%) of the remaining patients. A preliminary assessment of the survivals in the two groups was carried out: with one neoplasm localised in the mediastinum, and with the extensive disease or with a second neoplasm (Fig. 2). No differences were found; hence, it was decided to incorporate all the patients in a common analysis.

Tab. I. Clinical stage of the cancer in the analysed group

Clinical stage	Number of patients	Percentage
I	2	0.2
II	55	6.8
III A	388	48.3
III B	337	41.9
IV	21	2.6

Clinical characteristics

The assessment of the overall performance status score of the patients was performed according to the five-step Zubrod score. In the analysed group there was 1 patient with score 1, 606 patients with score 2 (75.5%), 189 with score 3 (23.5%) and 7 patients with score 4 (0.9%).

The basic criterion for qualification to the treatment was the presence of symptoms which significantly deteriorated the quality of life of the patients. These symptoms were shown in Tab. II.

Tab. II. Symptoms reported by the patients

Symptoms	Number of patients
Haemoptysis	109
Pain in the chest	280
Dyspnoea at rest	231
Superior vena cava syndrome	173
Dysphagia	53

In 148 patients (18.4%) the presence of the accompanying diseases necessitating for systematic treatment and deteriorating their overall state was found. A previous treatment with cytostatics with the palliative assumption was carried out in 52 patients (6.2%).

Method of treatment

Radiotherapy was carried out under the supervision of the same group of physicians. A technique of two opposite fields was applied – the anterior and the posterior one. The irradiated region comprised the primary lesion with a 2 cm margin for the patients in a bad overall state (Zubrod 3 and 4). With this method 231 patients were treated (28.8%). For the patients in

a better overall state, with better survival prognosis, the neighbouring mediastinum region was additionally included into the irradiation field. In this way 572 patients were treated (71.2%). In 227 patients (28.%) a single irradiation series, administering a dose of 20 Gy in 5 fraction was given, in 43 patients (5.4%) two series were performed with a total dose of 40 Gy in 5 fractions, in 298 patients (31.7%) 30 Gy in 10 fractions were given, and in 187 patients (23.3%) 22 Gy were given in 4 fractions. The remaining 48 patients (5.9%) received one fraction of 8 or 9 Gy, repeated after a one-week break according to the need. The fractionation method depended on the overall state of the patient: patients with a worse overall state received single fractions or were qualified to one irradiation series up to a total dose of 20 or 22 Gy. The total dose was calculated according to the ICRU recommendations in the middle of the AP dimension in the central radius for AP fields. The irradiation was carried out with the Cobalt 60 gamma beams, or photon X beams with energies of 4, 9 and 15 MeV from linear accelerators. In 53 patients the treatment was broken due to the aggravation of the overall state. These patients were included in the analysis.

After the treatment the patients were systematically followed-up: the group with worse prognosis in monthly intervals and the remaining group in 2 or 3-month intervals.

Statistical method

The source for the retrospective analysis of the clinical material were the case histories. The observation was closed on June 31, 2000. For all the patients the information whether the patient was alive, and if not, the date of death, was known. The basic information for the assessment of results was the survival time.

The survival time was measured from the starting date of irradiation to the date of death or the date of the last information that the patient lives. Survival probability was calculated with the Kaplan-Meier method [14]. The statistical significance $\alpha=0,05$ was assumed. The assumptions of the model were verified with the graphic methods. The information about the improvement was received from the patients. In this way the group of patients in which the radiotherapy gave an improvement of the quality of life was assessed. Multivariate analysis of prognostic factors was carried out with the use of the D.R. Cox proportional risk model [15]. The considered factors were: Zubrod score, presence of the coexisting diseases, previous chemotherapy, type of symptoms that were the reason for starting the therapy and the histopathological type of the neoplasm. The final form of the model was received in the way of a stepwise elimination of these variables for which the critical test level was larger than 0.1 ($p > 0.1$). The effectiveness of various dose fractionation methods in relation to the improvement was analysed. The significance of the differences in this analysis was tested with the logit model.

Results

Survivals

In the analysed group the probability of a 12-months survival was 25%±1.5%, and that of a 24-months survival was 8%±1%, median 6 months. The obtained results are shown in Fig. 3. The observation period was from 15 to 118 months, mean 11 months, median 6 months. In the investigated group 703 patients died, all of cancer.

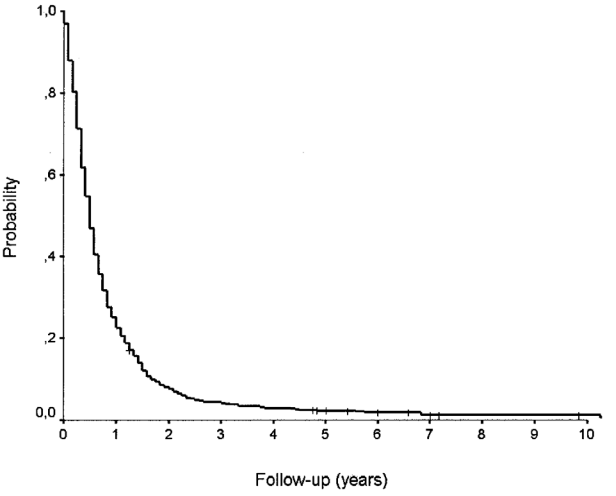

Fig. 3. Survival probability in the group of 803 patients irradiated palliatively to mediastinum because of an advanced, non-small cell lung cancer

Analysis of the prognostic factors

The material comprised the information on 803 patients. The total survival time was analysed. Multidimensional analysis of the prognostic factors was performed with the use of the D.R. Cox proportional risk model. The significance of the following factors was tested:

- performance status score,
- presence of coexisting diseases,
- previous chemotherapy with the palliative assumption,
- histological type of the cancer,
- various types of symptoms which were the reason of qualification to the treatment: pain, dysphagia, dyspnoea, haemoptysis, superior vena cava syndrome,
- expansive form of the disease (the patients with the spread outside the chest were also treated).

The parameters for which the critical level of the test was larger than 0.05 were rejected from the model – see Tab. III. The factors of the model used in the analysis are shown in Tab. IV.

Tab. III. Critical levels of the test for the factors rejected from the death risk model function. p – critical level of the test

Factor	p
Histological type of cancer	0.8893
Chemotherapy	0.8799
Coexisting diseases	0.4400
Haemoptysis	0.3594

Analysis of the effectiveness of radiotherapy

The analysis performed indicated the very high effectiveness of radiotherapy in the treatment of patients with the advanced, non-small cell lung cancer. The improvement

Tab. IV. Assessments of the Cox model parameters for the survival function. B – coefficient, S.E. – standard error, p – critical value of the test, RR – relative risk

Factor	B	S.E.	p	RR
Pain	0.2831	0.1133	0.0125	1.3272
Dyspnoea	0.4473	0.1154	0.0001	1.5641
Superior vena cava syndrome	1.0413	0.1325	0.0000	2.8330
Dysphagia	0.5395	0.1707	0.0016	1.7152
Performance status score (Zubrod)	0.8206	0.0921	0.0000	2.2718
Spread disease	0.4892	0.2276	0.0316	1.6311

Tab. V. Efficiency of various methods of fractionation of the total dose in the analysed material (logit model)

Fractionation method	Number of patients	No. of patients with improvement (%)	B	S.E.	p	Quotient of chances
10 * 300 cGy	298	250 (83.9)				
5 * 400 cGy	227	163 (71.8)	0.7152	0.2158	0.0009	2.0446
4 * 550 cGy	187	136 (72.7)	0.6692	0.2276	0.0033	1.9527
Other	91	56 (62.2)	1.1511	0.2685	0.0000	3.1615

of the overall state and the reduction of the symptoms were found in a significant part of the patients. In the case of haemoptysis the improvement was reported by 91.7% of the patients, in the case of pain – 74.2%, dyspnoea decreased significantly in 78.9%, dysphagia in 77.4%, and 60.7% of the patients with the superior vena cava syndrome reported an improvement. This efficiency did not have a confirmation in the radiological image of the disease. For the patients with haemoptysis, a total remission of the disease, assessed in the chest X-ray, was observed in only 1.8% of the patients, and a partial remission in 70.6%. For the patients with pain a total remission was found in 0.4% of the cases, and a partial one in 52.0%. In the patients with dyspnoea the total remission was found in 0.9% of the cases, and a partial one in 52.7%. In the patients with dysphagia there were no cases with total remission found, and a partial remission was found in 52.7%. In the patients with the superior vena cava syndrome no cases with total remission were found, and a partial remission was found in 23.4% of the patients. The efficiency of the types of fractionation applied in the analysis was analysed with the use of the logit model. The results can be found in Tab. V.

Progression after the treatment was found in 87 patients (10.8%). During the observation in 266 patients (35.6%) the features of a spread outside the chest were found. A vast majority of the patients had the features of presence of the tumour in the chest during the last investigation.

The practical prognostic index

To receive a more accurate tool for making a rational therapeutical decision, we have identified six factors that had the largest influence on the total survival in our analytical model. To this end we used the Cox proportional risk model. The factors were merged to receive a single prognostic index. The considered factors were:

– presence of the superior vena cava syndrome,
– performance status of the patient,
– spread of the disease outside the chest,
– selected symptoms (pain, dyspnoea, dysphagia).

Having the values of these symptoms for a specified patient one can calculate the value of the prognostic index i according to the following formula:

$$i = v + 0.8z + 0.5s + 0.5h + 0.4n + 0.3p \qquad (1)$$

where the symbols have a meaning and values described in Tab. VI. The coefficients appearing in front of the subsequent prognostic factors were determined in the multivariate Cox analysis – see Tab. IV. In the above formula the values of the coefficients were rounded.

Tab. VI. Symbols and values in Expr. (1) for six factors determining the total survival in the strongest way, used to construct the practical prognostic index

Symbol	Factor	Condition	Value
v	superior vena cava syndrome	absent	0
		present	1
z	performance status score (Zubrod)	1 or 2	0
		3 or 4	1
s	spread of the disease outside the chest	absent	0
		present	1
h	dysphagia	absent	0
		present	1
n	dyspnoea	absent	0
		present	1
p	pain	absent	0
		present	1

The index found in this way makes it possible to qualify the patient to one of four prognostic groups. The qualification is performed by rounding the index i found from the formula (1) to the nearest integer. The graphs of

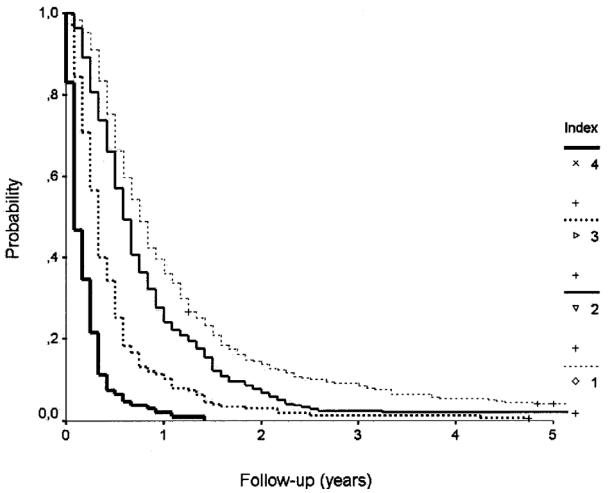

Fig. 4. Survival probability in the group of 803 patients irradiated palliatively to mediastinum because of an advanced, non-small cell lung cancer, in four prognostic groups, for the prognostic index according to formula (1)

total survivals for the four groups (graphs for the intermediate values of the index would lie between the respective graphs for the integer values are shown in Fig. 4). The patients belonging to the first prognostic groups have the best prognosis. If this group is taken as a reference level, then the patients belonging to the second group have 1.3 times larger death risk, those from the third group – 2.5 times larger risk, and those belonging to the fourth group – 5.5 times larger death risk. The formula (1) expresses the fact that the presence of the superior vena cava syndrome has the strongest negative influence on the prognosis, the next worse factor is the bad performance status, and the spread of the disease and the symptoms have a smaller importance.

Discussion

In the present work an assessment of the results of palliative radiotherapy applied as the only therapy in 803 patients with an advanced, non-small cell lung cancer was performed. The analysis has a retrospective character.

In the analysed group the probability of a 12-months survival was 25%±1.5%, and that of a 24-months survival was 8%±1%, median 6 months. These results are in conformity with those described in the literature: 1-year survivals reach 23%, 2-years survivals – 10%, median 5 months [20-22, 25, 26].

A survey of the literature indicates that the palliative radiotherapy carried out in patients with the advanced non-small cell lung cancer, with the symptoms related to the growth of the tumour in the chest, brings an improvement in 70-80% of the patients [3, 4, 7, 8, 13, 16, 17]. In our material, an average of 75.3% of the patients felt the decrease of the symptoms, from 60.7% to 91.7%, depending on the type of the symptoms, and 80 of them (10%) returned to work. The fact that the symptomatic patients should be qualified to such treatment is beyond discussion. However, an important problem in the discussion on the indications to the treatment is the group of patients in which severe symptoms resulting from the disease in the chest are not found. Such patients are about 30% of the patients with the non-small cell lung cancer [4-8]. A half of them do not need the irradiation of the disease in the chest until the end of their lives, in the second half the symptoms necessitating for a treatment appear sooner or later [3, 4]. Unfortunately, during the first examination it is not possible to qualify the patient to any of these two groups. The majority of the authors decide to undertake the palliative irradiation or to resign of it, by taking into account the clinical advancement of the disease, the overall performance status, the performance status of the circulatory system and the respiratory system, previous illnesses and coexisting diseases. Finally, this decision, which is extremely important for the patient, is made in an arbitrary manner. On the one hand, resignation of the palliative radiotherapy can deprive the patient of a chance for long-term remission, and on the other, undertaking the therapy in an asymptomatic patient with an advanced disease, in a bad overall state, can deteriorate his quality of life and shorten his survival [7, 18, 19]. The decision is difficult, since, according to the literature, the palliative radiotherapy has no influence on long-term survival [9-11, 20-22].

In the analysis of the results of the palliative treatment the problem of qualification to such treatment appears. Numerous studies indicate that the stage of the disease, histological type of the cancer, size of the tumour, age of the patients, previous chemotherapy have no influence on the results [7, 8, 12, 16, 17, 20, 22, 23, 28, 29]. The authors of the same papers point at the importance of the performance status of the patient, and analyse in case of which symptoms the largest improvement can be expected. The majority univocally indicates that these symptoms are: haemoptysis, pain, dyspnoea and cough. These indications are in conformity with the present analysis.

In the discussion on the palliative radiotherapy of the non-small cell lung cancer the questions on an optimal dose fractionation method are present. The opinions on the value of the total dose are contradictory. A part of the authors observe no improvement of the survivals in randomised studies in which the arm of total dose of 50 Gy conventionally fractionated is compared to smaller doses, with hypofractionation [10, 25, 26]. This does not correlate with the results of other studies, where such differences were observed [4, 13, 22, 27, 30].

In the vast majority of the clinics mainly the symptomatic patients are qualified to the palliative radiotherapy. The investigations of this group of patients indicate a high efficiency of large doses per fraction and short therapeutical series [17, 21, 31]. In our material a trial of assessing the efficiency of a number of fractionation methods of the total dose was undertaken (Tab. VI). The probability of an improvement was the largest for a single series of 10 fractions, 3 Gy each, and the smallest one was in the group of the so called other fractionation methods. This was the administration of one or two fractions, 8 or 9 Gy each, repeated after one-week break, according to the

necessity. The fractionation type depended on the overall status: patients with a worse overall status received single fractions.

In the present analysis, six factors that determine the overall survival in the strongest way were selected: presence of the superior vena cava syndrome, overall performance status of the patient, spread of the disease outside the chest, and the selected symptoms: pain, dyspnoea and dysphagia. These factors were merged in one expression, which describes the prognostic index. This proposition implies that the presence of all these factors in a patient significantly deteriorates the prognosis. Nevertheless, such situations can occur and we are obliged to help the patient. According to the published studies, radiotherapy with large fractions seems to be the best justified in such cases. The patients in good overall state and without symptoms have large chances for a long survival, according to the applied index (15% lives for 2 years, 10% – 3 years). Such considerations can give an answer in the long-lasting discussion whether asymptomatic patients should be treated.

All the studies on palliative radiotherapy in patients with non-small cell lung cancer univocally confirm its very large effectiveness, and no other similarly effective method is known. Maybe, the succeeding experience will give an answer to the questions on the value of the applied total dose and the optimal method of its fractionation in the therapy of non-operative patients with non-small cell lung cancer.

Conclusions

1. Palliative radiotherapy improves the quality of life in c. 75% of patients with the advanced, non-small cell lung cancer.
2. The largest improvement is observed in patients qualified because of haemoptysis, dyspnoea, dysphagia and pain in the chest.
3. The presence of the superior vena cava syndrome has a largest negative influence on the prognosis.
4. Performance status is the most significant prognostic factor in the qualification of patients with the advanced, non-small cell lung cancer to palliative treatment.

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Sprostowanie

W *Nowotworach* 2001; 51; 27-33, w pracy „Dose intensity of adjuvant CMF chemotherapy program for breast cancer" na stronie:

– 27 – w streszczeniu jest: „... (aRPI) of CMF reginect has bees assed.", a powinno być: „... (aRDI) of CMF regiment has been assessed".
– 32 -, w Conclusions jest: „... regiment.", a powinno być: „...regimen"