Immediate versus delayed palliative thoracic radiotherapy in patients with unresectable locally advanced non-small cell lung cancer and minimal thoracic symptoms: randomised controlled trial

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Abstract

Objective To determine whether patients with locally advanced non-small cell lung cancer unsuitable for resection or radical radiotherapy, and with minimal thoracic symptoms, should be given palliative thoracic radiotherapy immediately or as needed to treat symptoms.
Design Multicentre randomised controlled trial.
Setting 23 centres in the United Kingdom, Ireland, and South Africa.
Participants 230 patients with previously untreated, non-small cell lung cancer that is locally too advanced for resection or radical radiotherapy with curative intent, with minimal thoracic symptoms, and with no indication for immediate thoracic radiotherapy.
Interventions All patients were given supportive treatment and were randomised to receive palliative thoracic radiotherapy either immediately or delayed until needed to treat symptoms. The recommended regimens were 17 Gy in two fractions one week apart or 10 Gy as a single dose.
Main outcome measures Primary—patients alive and without moderate or severe cough, chest pain, haemoptysis, or dyspnoea six months from randomisation, as recorded by clinicians. Secondary—quality of life, adverse events, survival.
Results From December 1992 to May 1999, 230 patients were randomised. 104/115 of the patients in the immediate treatment group received thoracic radiotherapy (90 received one of the recommended regimens). In the delayed treatment group, 48/115 (42%) patients received thoracic radiotherapy (29 received one of the recommended regimens); 64 (56%) died without receiving thoracic radiotherapy; the remaining three (3%) were alive at the end of the study without having received the treatment. For patients who received thoracic radiotherapy, the median time to start was 15 days in the immediate treatment group and 125 days in the delayed treatment group. The primary outcome measure was achieved in 28% of the immediate treatment group and 26% of patients from the delayed treatment group (27/97 and 27/103, respectively; absolute difference 1.6%, 95% confidence interval –10.7% to 13.9%). No evidence of a difference was observed between the two treatment groups in terms of activity level, anxiety, depression, and psychological distress, as recorded by the patients. Adverse events were more common in the immediate treatment group. Neither group had a survival advantage (hazard ratio 0.95, 0.73 to 1.24; P=0.71). Median survival was 8.3 months and 7.9 months, and the survival rates were 31% and 29% at 12 months, for the immediate and delayed treatment groups, respectively.
Conclusion In minimally symptomatic patients with locally advanced non-small cell lung cancer, no persuasive evidence was found to indicate that giving immediate palliative thoracic radiotherapy improves symptom control, quality of life, or survival when compared with delaying until symptoms require treatment.

Introduction

A minority of patients with unresectable non-small cell lung cancer whose lesions are confined to the thorax are selected for immediate, radical radiotherapy aimed at cure or prolonging survival. For the remainder, however, advanced disease within the chest, the presence of distant metastases, or poor performance status preclude such potentially curative treatment.

Within this latter group, in the United Kingdom, patients with symptomatic disease, good performance status, no evidence of metastases, and who are considered able to tolerate a high dose palliative regimen are likely to be offered 39 Gy in 13 fractions or an equivalent regimen.[1] For patients who are unsuitable for a high dose palliative regimen—for example, because of poor performance status or metastatic disease—but who have thoracic symptoms requiring palliation, one or two fractions of palliative thoracic radiotherapy is the most commonly applied treatment. Some patients, however, are unsuitable for high dose palliative radiotherapy and have no, or only minimal, thoracic symptoms. For this group, the course of action is unclear—should they be offered immediate palliative thoracic radiotherapy or should a wait and see policy

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be adopted, with radiotherapy not being given until needed to treat thoracic symptoms? In a non-randomised, prospective study, 54% of 48 such patients who were monitored regularly without immediate radiotherapy eventually required chest irradiation because of progressive and appreciable symptoms caused by intrathoracic disease.[2]

For patients with non-metastatic, asymptomatic disease, some clinicians advocate immediate radiotherapy in the belief that local control is likely to prolong survival and may improve quality of life.[3 4] They also argue that, even for patients with metastases, immediate thoracic radiotherapy can be expected to prevent, delay, or improve thoracic symptoms. Other clinicians argue that no convincing evidence exists that immediate radiotherapy prolongs survival or improves quality of life compared with a wait and see approach, and they recommend that radiotherapy be reserved for palliative symptom control if and when required.[5 6]

No convincing evidence has been obtained from previous randomised trials to indicate which radiotherapy policy is preferable in terms of survival and quality of life. The United States veterans administration compared immediate and no radiotherapy in 554 patients who had localised, clinically inoperable disease.[7] A small survival advantage with radiotherapy was found, but this trial compared radiotherapy and no radiotherapy, not immediate radiotherapy and delayed radiotherapy. Also, the authors point out that supervision and supportive care, including infection control, were better in the radiotherapy group and could have accounted for the survival difference. Durrant and colleagues compared immediate radiotherapy and delayed treatment in 125 patients with inoperable disease confined to the thorax, but the delayed treatment was either radiotherapy or chemotherapy.[8] No difference in survival or performance status was found, but this was a small trial and some differences may have been missed. The European Organization for Research and Treatment of Cancer attempted a trial of immediate and delayed radiotherapy in asymptomatic, inoperable disease, but it abandoned the trial because only seven patients were randomised during the first year of accrual.[9]

We undertook the present randomised trial in patients with unresectable non-small cell lung cancer, with no, or only minimal, thoracic symptoms, in whom there was no compelling indication for immediate radiotherapy and who were not suitable for radical radiotherapy with curative intent. Our aim was to compare, in terms of chest symptoms, quality of life, and survival, (*a*) supportive treatment together with immediate, palliative, thoracic radiotherapy and (*b*) supportive treatment, radiotherapy not being given until indicated.

Methods

The main eligibility criteria were previously untreated, microscopically confirmed non-small cell lung cancer, locally too advanced for surgical resection or radical radiotherapy with curative intent; minimal thoracic symptoms; performance status of any World Health Organization (WHO) grade[10]; non-metastatic or metastatic disease; and no compelling indication for immediate thoracic radiotherapy. Local ethics committee approval of the protocol and individual patient consent were required.

Treatment allocation

Patients were randomly allocated by telephone by the Medical Research Council (MRC) trials office by using a minimisation procedure stratified by clinician, histology, presence of metastases, and WHO performance status, to supportive treatment plus either immediate or delayed thoracic radiotherapy. Supportive treatment consisted of active symptom control using whatever treatment was considered to be most appropriate; it included such drugs as analgesics, antibiotics, bronchodilators, psychotropics, and corticosteroids. The choice of radiotherapy regimen was left to the local radiotherapist, but the two regimens shown in previous MRC trials to have good palliative effect were recommended.[11 12] These were 17 Gy given as two 8.5 Gy fractions one week apart, or 10 Gy as a single dose. In the delayed treatment group, thoracic radiotherapy was held in reserve until needed to control symptoms arising from disease within the chest. In both treatment groups, on failure of the allocated policy, whatever further treatment was considered appropriate could be prescribed, including additional radiotherapy and cytotoxic drugs.

Reports and investigations

Patients were assessed at randomisation, one month and two months after randomisation, then every two months up to 12 months, and then every six months thereafter. Clinicians' reports included details of treatment, any adverse effects, symptoms (specifically cough, chest pain, dysphagia, sputum, haemoptysis, and shortness of breath), sites of any metastases, and WHO grade of performance status.[10] Quality of life was recorded by patients at all assessments using the Rotterdam symptom checklist,[13] to which four symptoms specific to lung cancer (chest pain, cough, hoarseness, coughing up blood) had been added, and the hospital anxiety and depression scale.[14] On the Rotterdam symptom checklist, patients recorded symptoms as being present: not at all (0), a little (1), moderately (2), or very much (3). Activity level and psychological distress were scored in accordance with the checklist's manual.[15] Hospital anxiety and depression scale subscale scores of 0-7 indicate normal mental health, scores of 8-10 indicate borderline anxiety or depression, and scores of 11 or more indicate possible clinical cases of anxiety or depression.

Statistical methods

All analyses were conducted on the basis of intention to treat. The primary outcome measure was the percentage of patients alive and without moderate or severe cough, chest pain, haemoptysis or shortness of breath as recorded by clinicians at six months from randomisation. Secondary outcome measures were quality of life, adverse events, and survival. We anticipated that the failure rate in achieving the primary outcome measure in the delayed treatment group would be 70%. To detect a reduction to 50% in the immediate treatment group at the 5% significance level with 90% power would require 150 patients to be randomised into each group, making a total of 300 patients. We intended to accrue this total over two years. However, we stopped the intake in May

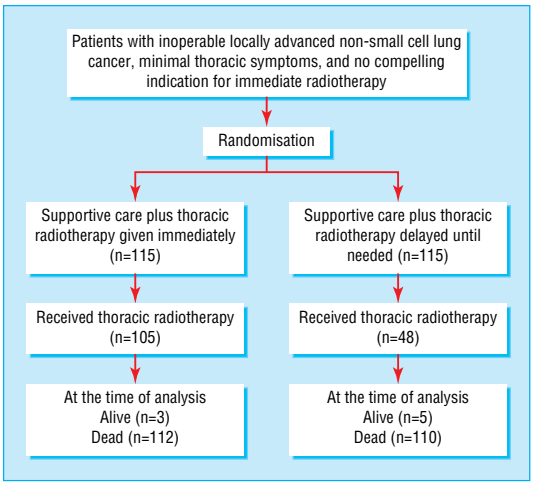


Fig 1 Trial profile

1999—when 230 patients had been randomised during 6.5 years—on the recommendation of an independent data monitoring and ethics committee on the grounds that the trial had achieved a reliable result.

In the analyses of symptom prevention and quality of life, we accepted data if they were recorded within two weeks before or after protocol assessment dates for one and two months, and within one month of assessment dates for four and six months.

We calculated duration of survival from the date of randomisation to the date of death from any cause; survivors were censored at the date they were last known to be alive. We used the log rank test to make treatment comparisons.

All P values are two sided. We managed the data using the COMPACT program[16] and analysed it by using the statistics software package SAS, version 6.12.

Results

Patients

Between December 1992 and May 1999, 230 patients (115 immediate treatment, 115 delayed treatment) were randomised from 23 centres in the United Kingdom, Ireland, and South Africa (fig 1). The two groups were well matched at randomisation (table 1). Although, according to the eligibility criteria, all patients were unsuitable for radical radiotherapy, only 27 (12%) had distant metastases, and 157 (68%) had a performance status of grade 0 or 1. As recorded by clinicians (table 2), slight or moderate cough and shortness of breath were common, but few patients had severe symptoms, and chest pain, dysphagia, and haemoptysis were uncommon.

Treatment received

The thoracic radiotherapy regimens we used to treat the patients are shown in table 3. In the immediate treatment group, 104 of the 115 patients received thoracic radiotherapy: 65 (57%) received the recommended 17 Gy regimen and 25 (22%) received the recommended 10 Gy regimen. Ten patients received no radiotherapy (four declined it, four were considered too ill from cancer or intercurrent disease, one died before radiotherapy could be given, and one was found to have had previous thoracic radiotherapy). Subsequently, 12 patients received additional thoracic radiotherapy and five received radiotherapy to metastatic sites. Only one patient received cytotoxic chemotherapy. In the delayed treatment group, 48 (42%) of the 115 patients were treated with thoracic radiotherapy (29 (60%) with one of the recommended regimens), 64 (56%) died without having received the thoracic radiotherapy, and the remaining three (3%) were still alive without having received it. Seven patients were given radiotherapy to metastatic sites, one of whom also received cytotoxic chemotherapy. For patients who received the thoracic radiotherapy, the median time to the start of the treatment was 15 days in the immediate treatment group and 125 days in the delayed treatment group.

Outcome

The outcome at all assessments up to six months, the predefined time for assessment of the primary outcome measure, is shown in table 4. None of the differences between the two treatment groups was statistically significant; the differences in success rates were 4.8% (95% confidence interval −10.8% to 20.5%) in favour of immediate treatment at one month, 13.0% (−3.3% to 29.3%) at two months, −8.4% (−21.6% to 4.7%) at four months, and 1.6% (−10.7% to 13.9%) at six months. At months 1-4, the most common reason for failure was the presence of moderate or severe symptoms, whereas at six months it was death.

These analyses were repeated using data recorded by patients on the Rotterdam symptom checklists. At each assessment, somewhat less information was available than that obtained from the clinicians' forms, and the proportions of patients with a successful outcome were somewhat lower, but none of the differences between the two treatment groups was statistically significant (data not shown).

Because some patients had moderate or severe symptoms at randomisation (table 2), the analysis shown in table 4 was repeated in patients with no symptoms or only mild symptoms. The proportions of patients in this subgroup with a successful outcome were, in the immediate treatment and delayed treatment groups, respectively, 72% and 63% (31/43 and 41/65) at one month (difference 9.0%, −8.8% to

Table 1 Characteristics of patients randomised to receive palliative thoracic radiotherapy immediately or delayed until needed to treat symptoms. Values are numbers (percentages)

Characteristic	Immediate treatment (n=115)	Delayed treatment (n=115)	Total (n=230)
Median (range) age in years	72 (47-84)	71 (50-87)	71 (47-87)
Sex:			
Male	76 (66)	84 (73)	160 (70)
Female	39 (34)	31 (27)	70 (30)
Histology*:			
Squamous	70 (61)	69 (61)	139 (61)
Adenocarcinoma	19 (17)	17 (15)	36 (16)
Other	26 (23)	28 (25)	54 (24)
Not specified	0	1	1
Distant metastases*	13 (11)	14 (12)	27 (12)
Performance status*:			
0	22 (19)	21 (18)	43 (19)
1	55 (48)	59 (51)	114 (50)
2	34 (30)	30 (26)	64 (28)
3	4 (3)	5 (4)	9 (4)

*Stratification variables.

Table 2 Patients' symptoms, as recorded by clinicians, at randomisation of patients into two groups: immediate treatment with palliative thoracic radiotherapy or delayed until needed to treat symptoms. Values are numbers (percentages)

Symptom	Immediate treatment (n=115)	Delayed treatment (n=115)	Total (n=230)
Cough:			
None	24 (21)	27 (23)	51 (22)
Slight, occasional	68 (59)	71 (62)	139 (60)
Moderate, persistent, troublesome	19 (17)	17 (15)	36 (16)
Severe and distressing; disturbed sleep	4 (3)	0	4 (2)
Chest pain:			
None	86 (75)	87 (76)	173 (75)
Slight, occasional	24 (21)	25 (22)	49 (21)
Moderate, persistent, troublesome	5 (4)	3 (3)	8 (3)
Severe and distressing; disturbed sleep	0	0	0
Haemoptysis:			
None	95 (83)	97 (84)	192 (83)
Slight, occasional flecking	18 (16)	17 (15)	35 (15)
Moderate, daily, or clots several days per week	2 (2)	1 (1)	3 (1)
Severe, daily gross, or massive	0	0	0
Shortness of breath*:			
Climbs hills or stairs without dyspnoea (none)	24 (21)	23 (21)	47 (21)
No dyspnoea on flat (mild)	40 (35)	42 (38)	82 (36)
Walks >100 yards without dyspnoea (mild)	27 (23)	26 (23)	53 (23)
Dyspnoea on walking ⩽100 yards (moderate)	19 (17)	15 (13)	34 (15)
Dyspnoea on mild exertion, eg undressing (moderate)	5 (4)	5 (4)	10 (4)
Dyspnoea at rest (severe)	0 (0)	1 (1)	1 (<1)
Not recorded	0	3	3
Sputum:			
None	48 (42)	60 (52)	108 (47)
Slight, small amount	52 (45)	46 (40)	98 (43)
Moderate, persistent, requiring pot or tissue	15 (13)	9 (8)	24 (10)
Severe, gross amount	0	0	0
Dysphagia:			
None	110 (96)	110 (96)	220 (96)
Some difficulty; no disturbance of diet	3 (3)	5 (4)	8 (3)
Difficulty, soft diet required	2 (2)	0	2 (1)
Considerable difficulty, fluids only	0	0	0
Complete	0	0	0

*For consistency with other symptoms of the primary outcome measure, shortness of breath was compressed into four categories for analysis as indicated.

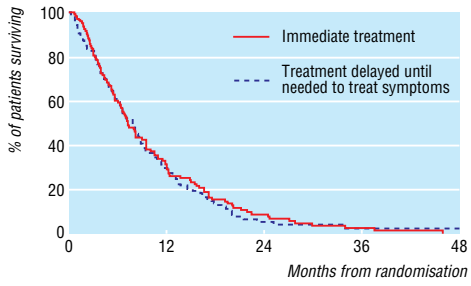
27%), 70% and 51% (32/46 and 24/47) at two months (difference 19%, −1.0% to 38%), 37% and 51% (23/63 and 33/65) at four months (difference −14%, −31% to 2.7%), and 35% and 36% (22/62 and 25/69) at six months (difference −0.7%, −17% to 16%). None of these differences was statistically significant, but a delay in the appearance of moderate or severe symptoms is suggested in the immediate treatment group.

Activity level

On the Rotterdam symptom checklist subscale of activity level, scores range from 7 (best) to 28 (worst). The median scores (table 5) were similar in the two treatment groups.

Anxiety depression and psychological distress

Levels of anxiety and depression assessed from hospital anxiety and depression scale scores (table 6) were similar between the treatment groups and did not change with time, but these comparisons were not made on the same patients at each assessment. Similarly, the median Rotterdam symptom checklist psychological distress scores were similar at all assessments in both treatment groups, showing no evidence of a change with time (data not shown).



No of patients at risk					
Immediate treatment	115	35	9	2	0
Delayed treatment	115	33	5	1	1

Fig 2 Percentage of patients surviving after date of randomisation

Main adverse effects of treatment

The main adverse effects of treatment as recorded by clinicians are shown in table 7. Adverse effects of any type were reported more commonly in the immediate treatment group (24 patients) than in the delayed treatment group (12 patients). Dysphagia was the most common adverse effect, being reported in 14 patients from the immediate treatment group and in six patients in the delayed treatment group. One case of radiation pneumonitis occurred, in the delayed treatment group.

Survival

Overall, 112 patients in the immediate treatment group and 110 in the delayed treatment group have died. No evidence of a survival advantage to either group was found (hazard ratio 0.95, 0.73 to 1.24; P=0.71) (fig 2). Median survival was 253 days (8.3 months) in the immediate treatment group and 240 days (7.9 months) in the delayed treatment group, and the survival rates at 12 months were 31% and 29%, respectively.

Table 3 Thoracic radiotherapy regimens

Regimen	Immediate treatment (n=115)	Delayed treatment (n=115)
Recommended:		
17 Gy in 2 fractions	65	15
10 Gy in a single dose	25	14
Other:		
8 Gy in a single dose	1	1
12 Gy in 2 fractions	1	0
16 Gy in 2 fractions	1	0
20 Gy in 5 fractions	2	2
20 Gy in 4 fractions	0	1
25 Gy but stopped after 1 fraction	0	1
30 Gy in 10 fractions	2	8
36 Gy in 12 fractions	2	0
39 Gy in 13 fractions	2	1
40 Gy in 15 fractions	1	0
42 Gy in 29 fractions	1	0
50 Gy in 20 fractions	1	1
Dose and fractionation not stated	0	4
No thoracic radiotherapy	10	67
No information	1	0

Table 4 Outcome at all assessments as recorded by clinicians. Values are numbers (percentages)

Patient group	1 month		2 months		4 months		6 months	
	Immediate treatment (n=115)	Delayed treatment (n=115)	Immediate treatment (n=115)	Delayed treatment (n=115)	Immediate treatment (n=115)	Delayed treatment (n=115)	Immediate treatment (n=115)	Delayed treatment (n=115)
Inadequate data for assessment:								
Missing items on forms	4	1	1	1	2	2	3	0
No form at specified time-point	45	21	40	46	14	15	15	12
Total	49	22	41	47	16	17	18	12
Evaluable patients*	66	93	74	68	99	98	97	103
Successful outcome†	38 (58)	49 (53)	39 (53)	27 (40)	29 (30)	37 (38)	27 (28)	27 (26)
Failed outcome:								
Death before specified time point	2 (3)	4 (4)	8 (11)	14 (21)	29 (29)	29 (30)	46 (47)	45 (44)
Moderate or severe symptoms	26 (39)	40 (43)	27 (36)	27 (40)	41 (41)	32 (33)	24 (25)	31 (30)
Total	28 (42)	44 (47)	35 (47)	41 (60)	70 (71)	61 (62)	70 (72)	76 (74)

*Some patients treated immediately were still receiving radiotherapy, which led to an imbalance at 1 month.
†Defined as alive and without moderate or severe cough, chest pain, haemoptysis, or shortness of breath.

Discussion

This randomised controlled trial has provided no persuasive evidence that immediate palliative thoracic radiotherapy improves the outcomes for patients with unresectable, locally advanced non-small cell lung cancer and minimal thoracic symptoms. Short courses of thoracic radiotherapy may be offered to such patients when appreciable symptoms develop.

Patients requiring intensive palliative radiotherapy

This trial needs to be seen in the context of previous trials of palliative thoracic radiotherapy for patients with unresectable non-small cell lung cancer that is locally too advanced for radical radiotherapy. For patients with non-metastatic disease and good performance status, an intensive palliative regimen such as 39 Gy in 13 fractions should be considered; this high dose regimen was associated with longer survival in a comparison with 17 Gy in two fractions, although at the expense of more acute toxicity and less rapid symptom control.[1] For patients with thoracic symptoms requiring treatment but unsuitable for an intensive palliative regimen—for example, because of metastatic disease or poor performance status—17 Gy in two fractions or 10 Gy as a single dose should be considered.[17]

Patients with minimal thoracic symptoms

In the management of patients with minimal thoracic symptoms at presentation, the present trial has provided no persuasive evidence that giving immediate palliative thoracic radiotherapy provides a survival advantage or deferment of appreciable thoracic symptoms (cough, chest pain, haemoptysis, or breathlessness). Although a better outcome was suggested at one and two months after randomisation, at the primary end point at six months, symptom control was no better in patients treated with immediate radiotherapy than in patients given treatment when symptoms developed.

This trial supports a policy of offering short courses of thoracic radiotherapy when appreciable symptoms develop in patients with advanced non-small cell lung cancer for whom no other interventions are planned. Short schedules using one or two fractions of radiotherapy are efficient at relieving the local symptoms of lung cancer, without detriment in terms of either survival time or the toxicity of therapy compared with other longer schedules.[11,12] Only 42% of patients in the delayed group received thoracic

Table 5 Activity level scores, as recorded by patients using the Rotterdam symptom checklist, during the first six months of patients receiving palliative thoracic radiotherapy treatment immediately or delayed until needed to treat symptoms

Month	No of evaluable patients		Median score (range)	
	Immediate treatment	Delayed treatment	Immediate treatment	Delayed treatment
0	109	110	9 (7-22)	9 (7-27)
1	59	81	11 (7-23)	9 (7-27)
2	61	51	9 (7-24)	10 (7-27)
4	59	58	10 (7-28)	10 (7-28)
6	45	49	10 (7-28)	12 (7-26)

Table 6 Anxiety and depression as recorded by patients on the hospital anxiety and depression scale. Values are numbers (percentages)

Month	No assessed		Normal		Borderline		Case	
	Immediate treatment	Delayed treatment	Immediate treatment	Delayed treatment	Immediate treatment	Delayed treatment	Immediate treatment	Delayed treatment
Anxiety:								
0	109	112	70 (64)	82 (73)	26 (24)	18 (16)	13 (12)	12 (11)
1	60	82	45 (75)	60 (73)	9 (15)	17 (21)	6 (10)	5 (6)
2	60	53	44 (73)	40 (75)	12 (20)	12 (23)	4 (7)	1 (2)
4	59	60	40 (68)	41 (68)	13 (22)	11 (18)	6 (10)	8 (13)
6	48	50	34 (71)	32 (64)	11 (23)	10 (20)	3 (6)	8 (16)
Depression:								
0	109	113	86 (79)	90 (80)	19 (17)	14 (12)	4 (4)	9 (8)
1	60	82	47 (78)	66 (80)	7 (12)	8 (10)	6 (10)	8 (10)
2	60	53	49 (82)	40 (75)	6 (10)	8 (15)	5 (8)	5 (9)
4	59	60	44 (75)	46 (77)	7 (12)	6 (10)	8 (14)	8 (13)
6	48	50	36 (75)	36 (72)	5 (10)	6 (12)	7 (15)	8 (16)

Table 7 Main adverse effects of palliative thoracic radiotherapy treatment as recorded by clinicians. Values are No of patients

Adverse effect	Immediate treatment (n=115)	Delayed treatment (n=115)
Dysphagia	14	6
Chest pain	2	3
Nausea and/or vomiting	3	2
Lethargy	2	1
Anorexia	1	1
Radiation pneumonitis	0	1
Total	24	12

radiotherapy, at a median of 125 days after randomisation. This suggests that, for many patients in whom major thoracic symptoms are not the presenting feature, firstly, a minority will develop significant local thoracic symptoms, which clinicians feel it appropriate to treat with local radiotherapy and, secondly, there should be an emphasis on the management of the more systemic symptomatic manifestations of the disease.

Although palliative radiotherapy is predominantly used for the relief of local symptoms, sometimes it is used as a psychological support. This trial shows, however, that the levels of anxiety, depression, psychological distress, and physical activity recorded by patients were not affected by delaying treatment. The data suggest that, with careful explanation and informed consent, as was necessary to enrol patients into this trial, delaying therapy appropriately does not lead to an increase in psychological distress.

Patterns of care

This trial was designed in the late 1980s and early 1990s and opened in December 1992. At that time, many respiratory physicians in the United Kingdom did not refer patients for treatment with radiotherapy unless there were appreciable local symptoms such as haemoptysis, chest pain, breathlessness, or cough. Such practice is now changing as a result of the widespread introduction of multidisciplinary teams, with a national requirement that the care of each new patient with lung cancer—whatever the extent of disease or severity of symptoms—be discussed within this framework. Such patterns of care should increase the frequency with which patients are offered treatments that alter the course of the disease, most particularly surgical resection or radical radiotherapy. Radical radiotherapy can be curative in selected cases, especially when the CHART (continuous hyperfractionated accelerated radiation therapy) regimen is used.[18]

Chemotherapy has now reliably been shown to prolong survival in patients with metastatic non-small cell lung cancer and good performance status, and to improve long term survival when used as an adjunct to radiotherapy in locally advanced disease.[19 20] Indeed, most of the patients in the present trial were of reasonable functional status (WHO performance status 0-2), and may now justifiably be considered for systemic chemotherapy. This emphasises again the need for therapeutic plans to be discussed within multidisciplinary teams.

The following consultants and their colleagues entered 10 or more patients: J MacMahon, DRT Shepherd, and G Varghese (Belfast City Hospital); SJ Falk, M Tomlinson, and RJ White (Bristol Oncology Centre and Frenchay and Yeovil District Hospitals); NM Bleehen, D Gilligan, A Price, and MV Williams (Cambridge Addenbrooke's and Papworth Hospitals); P Canney, RD Jones, FR Macbeth, and N O'Rourke (Glasgow Beatson Oncology Centre and Western Infirmary); D Whillis (Inverness Raigmore Hospital); IDA Johnston and DAL Morgan (Nottingham City and University Hospitals); JJ Bolger, AE Champion, and IH Manifold (Sheffield Weston Park Hospital). The remaining patients were entered by the following consultants and their colleagues: MA Coe (Clatterbridge Centre for Oncology); DG Sinnamon (Coleraine Hospital); N Munro (Consett Shotley Bridge Hospital); CVP Lawford (Coventry and Warwickshire Hospital); SJ Pearce (Dryburn Hospital); A Gregor (Edinburgh Western General Hospital); RP Abratt (Groote Schuur Hospital, South Africa); I Gleadhill (Lisburn Lagan Valley Hospital); M Pearson (Liverpool Aintree Hospital); SJ Karp (London North Middlesex Hospital); JM Bozzino and UK Mallick (Newcastle General Hospital); NP Rowell (Oxford Churchill Hospital); AJ Dorward (Paisley Royal Alexandra Hospital); F Daniel (Plymouth Derriford Hospital); M Clague (Sunderland Royal Hospital); NP Rowell and D Tait (Sutton Royal Marsden Hospital).

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What is already known on this topic

Radiotherapy is commonly given to patients with inoperable non-small cell lung cancer in the United Kingdom

One or two fractions of palliative radiotherapy can control thoracic symptoms

What this study adds

In the group of patients with no symptoms or only minimal symptoms, palliative thoracic radiotherapy can be safely deferred until significant thoracic symptoms appear

Compared with immediate, palliative radiotherapy, no evidence exists that such a policy affects patients' survival or levels of activity, anxiety, or depression

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