REVIEW

Psychosocial aspects of lung cancer

Kathrine Carlsen a,∗, Anders Bonde Jensen b, Erik Jacobsen c, Mark Krasnik d, Christoffer Johansen a

a Department of Psychosocial Cancer Research, Institute of Cancer Epidemiology, Danish Cancer Society, Strandboulevarden 49, DK-2100 Copenhagen, Denmark
b Department of Oncology, Aarhus University Hospital, Aarhus, Denmark
c Department of Thoracic Surgery, Odense University Hospital, Odense, Denmark
d Department of Thoracic and Cardiovascular Surgery, Gentofte University Hospital, Hellerup, Denmark

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Lung cancer; Psychosocial; Social; Depression; Anxiety; Review

Summary
Background: Lung cancer is one of the commonest cancers in the industrialised world, and persons with this grave disease must deal not only with the physical effects but also with the psychosocial aspects.

Methods: This review is based on an examination of intervention, prospective and case-control studies with more than 50 participants published between 1966 and 2003.

Results: The studies show that on average one out of four persons with lung cancer experience periods of depression or other psychosocial problems during their illness. Persons who are not offered treatment for their cancer and persons with small-cell lung cancer have a higher risk compared to other groups of lung cancer patients. The degree of depression can be reduced by psychosocial interventions.

Conclusions: We suggest that psychosocial screening of persons with lung cancer could prevent depression and might result in improved quality of care.

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* Corresponding author. Tel.: +45 35257500;
fax: +45 35257731.
E-mail address: kathcarl@cancer.dk (K. Carlsen).

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1. Introduction

Lung cancer is one of the commonest cancers in the industrialised world. In Europe, lung cancer accounts for about 25% of deaths from cancer among men and 9% among women [1]. Among women, mortality rates from lung cancer are increasing faster than for any other cancer type [2]. The grave prognosis is due partly to the fact that the disease is usually diagnosed in advanced stages [3], with an overall 5-year survival rate in Europe of 6–16% [4] and a less favourable rate for persons with small-cell lung cancer than for those with non-small-cell lung cancer [5].

Clinical psychosocial interventions are more often applied to cancer patients with longer expected survival times than those of lung cancer patients. A number of studies have indicated the need to focus on the quality of life of lung cancer patients [6–8], owing to improvements in palliative treatment [9–11]. Few studies have, however, investigated the psychosocial effects or the effects of psychosocial interventions on persons with lung cancer.

We conducted a review of studies of the psychosocial effects of a diagnosis of and treatment for lung cancer as well as randomised studies of psychosocial interventions, in order to evaluate the evidence for more extensive psychosocial intervention programmes for these persons.

2. Materials and methods

The MedLine (1966–August 2003) database was searched with the keywords lung and cancer combined with psychosocial or social and anxiety or depression or quality of life. Citations were also sought manually in the identified papers and reviews. Through this search, we identified 212 studies—194 through MedLine and 18 found manually. The exclusion criteria are listed in Fig. 1. A full list of the studies can be obtained by contacting the corresponding author.

3. Results

3.1. Prospective studies

Of the 10 prospective studies identified (Table 1), only one included measurement of the baseline prevalence of depression before diagnosis. In this study from the United Kingdom [12,13], the overall prevalence of depression among 50 persons with inoperable lung cancer was reduced from 26% before diagnosis to 16% at follow-up. This reduction was found only among patients receiving radiotherapy or chemotherapy. Among persons who did not receive any specific anticancer treatment, the number of cases of depression was higher at follow-up than at baseline.

In a study in Norway by Kaasa and Mastekaasa [14], 101 patients with inoperable non-small-cell lung cancer were randomized to chemotherapy or radiotherapy. Baseline measurements were taken...
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<td>Self-rating questionnaire and structured clinical interview, Baseline before diagnosis</td>
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<td>Kaasa and Mathekaasa (1988) [14], Norway</td>
<td>101 patients, Non-small-cell lung cancer, Stage T1—N2, Follow-up, 14—52 weeks</td>
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<td>Psychosocial well-being not correlated with type of treatment but highly correlated with disease-related symptoms. Lower quality of life indicates more anxiety and depression. Statistically significant increase in depression scores between baseline and follow-up.</td>
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<td>Montazeri et al. (1998) [15], Scotland</td>
<td>129 patients, 82 cell alive at follow-up, Baseline before diagnosis, Follow-up 3 months after treatment</td>
<td>Interviewer administered questionnaire HADS EORTC QLQ-C30</td>
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<td>Hopwood and Stephens (2000) [6], United Kingdom</td>
<td>129 patients, 33 small cell, 47% non-small cell, Follow-up for small cell 14—35 days after first treatment, Follow-up for non-small cell 21—56 days after start of radiotherapy</td>
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<td>Montazeri et al. (2001) [16], Netherlands</td>
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<td>Akechi et al. (2001) [18], Japan</td>
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<td>Self-reported anxiety and depression at baseline, Self-reported anxiety and depression at baseline, Self-reported anxiety and depression at baseline, Self-reported anxiety and depression at baseline.</td>
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<td>Level of pain at baseline and development of depression during follow-up predictors for suicidal ideation or follow-up.</td>
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<td>Uchitomi et al. (2002) [21], Japan</td>
<td>226 patients, Non-small cell, Baseline 1 month after surgery, Follow-up 3 months after surgery</td>
<td>Structured interview. DSM-III-R, POMS, MAC</td>
<td>Depression, Psychological distress, Helplessness and hopelessness, Fighting spirit</td>
<td>Physician support had significant impact on fighting spirit among female patients with no history of depression.</td>
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<td>Akechi et al. (2003) [22], Japan</td>
<td>212 patients, Non-small cell, Stage I—IIIb, Baseline 1 month after surgery, Follow-up 3 months after surgery</td>
<td>Semi-structured interview. DSM-III-R-POMS</td>
<td>Depression, Psychological burden</td>
<td>Incidence of depression 1 year after surgery associated with depression at diagnosis and educational level.</td>
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HADS, Hospital Anxiety and Depression Scale; EDRTC QLQ-C30, European Organization for Research and Treatment of Cancer Quality of Life Questionnaire; LC-13, lung cancer module; CES-D, Center for Epidemiological Studies Depression Scale; MOS, Medical Outcomes Studies, physical and social functioning; SF-36, 36-item Short Form Health Survey, physical and social functioning; DSM-III-R, Diagnostic Structured Clinical Manual of Mental Disorders, structured clinical interview to measure psychological response; MAC, Mental Adjustment to Cancer scale; HAMO, Hamilton Rating Scale for Depression.
after the diagnosis but before initial treatment, and follow-up data were collected seven times during the first year after treatment. Psychosocial well-being was significantly dependent on the general symptoms of lung cancer and the patients’ physical functioning, and this finding was independent of the clinical response to treatment.

In a study in the United Kingdom by Montazeri et al. [15], 23% of 129 persons with lung cancer were depressed and 16% were anxious. At follow-up 3 months after completion of initial treatment, 39 persons (30%) had died or were terminally ill. The prevalence of depression in the remaining 82 participants was 44%, a significant increase over the baseline rate; however, the prevalence of anxiety did not change from baseline. The overall quality of life was significantly associated with depression, as persons with lower levels of quality of life had a significantly higher level of depression both before and after diagnosis.

Another study in the United Kingdom [6] indicated that the baseline prevalence of depression was 43% among 352 persons with small-cell lung cancer and 21% among 366 persons with non-small-cell lung cancer, while the prevalence of anxiety was 43% and 25%, respectively. There was no statistically significant change in depression rates between baseline and follow-up 14–56 days after initial treatment. After stratification for lung cancer type, the prevalence of depression among persons with small-cell lung cancer was found to have increased significantly since baseline, whereas persons with non-small-cell lung cancer became significantly less depressed during the follow-up period. The authors concluded that this difference in outcome could be explained by the reduced performance status of patients with small-cell lung cancer.

Quality of life and respiratory symptoms among 164 patients with inoperable non-small-cell lung cancer was evaluated before and five times during the first year after radical radiotherapy [16]. During treatment, significant deterioration was seen in physical functioning, role functioning and global quality of life. Independently of tumor response, the patients’ functional ability, social functioning and global quality of life were significantly improved just after the end of treatment, but the effects lasted for a maximum of 6 months.

In a study in the USA of 228 geriatric patients with lung cancer, social functioning, symptom severity and type of treatment significantly predicted the level of depression measured four times during the first year after inclusion in the study. In addition, the authors observed that radiation treatment, especially for elderly women, significantly reduced the level of depression [17]. The authors did not indicate, however, whether the radiation treatment offered was intended as a long-lasting curative treatment or as palliation.

Akechi et al. [18] analysed the determining factors for psychiatric symptoms in 129 persons with nonresectable non-small-cell lung cancer in Japan. Psychological distress was associated with age and pain at diagnosis and initial treatment, but was predicted by anxiety and depression at follow-up 6 months later. Akechi et al. [19] also observed that pain at baseline and development of depression during follow-up were predictors of suicidal thoughts.

Two other studies in Japan, by Uchitomi et al. [20, 21], were based on 262 patients treated for non-small-cell lung cancer by curative resection. In the first study [20], physician support significantly increased ‘fighting spirit’ and reduced distress among female lung cancer patients with no history of depression. There was no association between depression and use of a physician as a confidant, but the investigators identified an association between satisfaction with confidants other than a physician and a reduced prevalence of depression. In the second study [21], depression diagnosed within the first month after diagnosis of lung cancer or surgery was a significant predictor of depression at follow-up 12 months later. In addition, less well-educated patients were at higher risk for developing depression. All 22 patients (8%) with symptoms of major or minor depression were recommended psychiatric consultation. The authors concluded that the prevalence of depression at follow-up is underestimated due to this psychiatric intervention.

In summary, persons with a diagnosis of lung cancer for whom medical doctors cannot propose treatment, patients who have symptoms of depression in the period close to the diagnosis and patients who are less well educated are at higher risk of depression subsequently. Further, the histological type of lung cancer appears to influence the risk for depression, partly reflecting the different treatments offered and the different disease courses.

3.2. Randomised clinical trials

Three randomised intervention studies were found (Table 2).

In a study in the USA [22] on the psychosocial well-being of 78 persons with lung cancer, the effects of a home care treatment regimen were tested. The main intervention group ($n = 24$) received a special oncology home care programme.
<table>
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<tr>
<th>Study and location</th>
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<td>McCorkle et al. (1989) [22], USA</td>
<td>78</td>
<td>Progressive non-small cell and small cell, Stage not specified</td>
<td>SDS; McGill-Melzack Pain Questionnaire; Inventory of Current Concerns; POMS; Enforced Social Dependency; General Health Rating Index; Medical Record Review Instrument</td>
<td>Oncology home care programme: specially trained nurses gave instruction in symptom and pain management, physical and psychosocial assessment and communication systems. Standard home care programme: a team of health professionals without special training in oncology guided the patients. Office care programme: Standard care by the patient's physicians. Specially trained nurses gave advice on management of breathlessness.</td>
<td>After 6 weeks, patients in the two intervention groups had less distress, fewer symptoms and greater independence than patients in the control group. After 34 weeks, no difference between the three groups.</td>
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<td>Bredin et al. (1999) [23], United Kingdom</td>
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<td>Intervention group had significantly less depression than persons in the control group</td>
<td>Breathlessness, WHO performance status, physical symptoms and activity improved in intervention group compared with control group. Patients in intervention group had reduced depression, were more satisfied with treatment and had better emotional functioning than controls.</td>
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<td>Moore et al. (2002) [24], United Kingdom</td>
<td>202</td>
<td>Mainly non-small cell but small cell also included; Stages I–IV</td>
<td>EORTC QLQ-C30; EORTC QLQ-LC13; Questionnaires about patient satisfaction</td>
<td>Intervention group had open access to nurse specialists; patients' conditions improved regularly. Control group referred to routine appointments</td>
<td>Patients in intervention group had reduced depression, were more satisfied with treatment and had better emotional functioning than controls.</td>
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<td>Case-control study</td>
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<td>Gore et al. (2000) [25], United Kingdom</td>
<td>100</td>
<td>Cases: Chronic obstructive pulmonary disease; Carcinoid; Non-small cell lung cancer; Stage not specified</td>
<td>SGQR for cases; EORTC QLQ-C30 and EORTC QLQ-LC13 for controls; Both groups: SF-36, EADL, and HADS</td>
<td>Persons with lung cancer were less depressed and less anxious than persons with chronic obstructive pulmonary disease.</td>
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<td></td>
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SDS: Symptom Distress Scale; POMS: Profile of Mood States; HADS: Hospital Anxiety and Depression Scale; EORTC QLQ-C30: European Organization for Research and Treatment of Cancer Quality of Life Questionnaire; EORTC QLQ-LC13: European Organization for Research and Treatment of Cancer Quality of Life Questionnaire for Lung Cancer; SGQR: St George's Respiratory Questionnaire; SF-36: Short Form Health Survey; EADL: Extended Activities and Daily Living.
in which educated nurses gave advice on symptom management, physical and psychosocial assessments, treatments and community resources. Another intervention group (n = 27) received home care from a nonspecialized nurse. The control group (n = 27) received the usual care from their physicians. At follow-up 32–34 weeks after diagnosis, the patients in the three groups experienced the same level of symptom distress and social dependency, but patients in the control group reached the highest level of distress 6 weeks before patients in the two intervention groups, and this effect was significant.

In a study in the United Kingdom [23], 51 persons were offered a voluntary visit to a nursing clinic three to eight times during the 8-week study period with the aim of improving their ability to cope with breathlessness, maximize their existing lung function and improve their overall psychosocial well-being. The nurses who were responsible for the intervention were also trained in early recognition of problems warranting pharmacological or medical intervention. Patients in the control group (n = 52) received standard care. At follow-up 8 weeks after inclusion, the authors observed a significant improvement in breathlessness, WHO performance status, depression and physical symptoms among patients in the intervention group when compared with patients in the control group.

In another study in the United Kingdom [24], 99 persons with lung cancer were offered open access to a nurse specialist who was trained to identify signs of disease progression and symptoms warranting intervention or serious complications. The nurses were also trained to coordinate the general practitioner and the primary health care team. Persons in the control group (n = 103) were seen at one appointment after treatment and then every second or third month. During follow-up, the patients who received nursing care showed a significant reduction in dyspnoea and significantly better emotional functioning.

3.3. Case-control study

On the basis of the defined inclusion criteria, we identified one case–control study in the United Kingdom (Table 2) [25], in which anxiety and depression were measured in 50 persons with chronic obstructive pulmonary disease (cases) and 50 persons with inoperable non-small-cell lung cancer (controls). The persons with lung cancer were significantly less anxious (p < 0.001) and less depressed (p < 0.01) than the persons with chronic obstructive pulmonary disease, as measured on the Hospital Anxiety and Depression Scale. The authors concluded that the specialist palliative care given to the persons with lung cancer positively influenced their general well-being.

4. Discussion

In our review of studies on the psychosocial aspects of lung cancer, only 14 fulfilled our inclusion criteria. The review nevertheless revealed that persons with lung cancer have a high risk for psychosocial problems after diagnosis and treatment.

Most of the identified studies used depression as an outcome measure, but wide variations in the prevalence of this significant psychiatric disorder were reported, ranging from 5% [18] to 52% [25]. Not surprisingly, the potential for cure was an important determinant of psychological distress. The variation in results might therefore be due to differences in initial stage of the disease and in the side-effects of the different treatments given, depending on the histology of the tumour.

Most of the studies had methodological limitations, and insufficient explanation of the design used made it difficult to evaluate whether there was a causal relationship between the cancer diagnosis and the psychological effect. In addition, many of the studies had a limited follow-up [23] or a low participation rate [22]. More than half the studies in our review had fewer than 200 participants or lacked descriptions of the stage and type of lung cancer. Thus, we cannot exclude that bias, confounding and chance may have had a significant impact on the associations observed.

Although in most of the studies adjustment was made for one or more confounding factors, such as sex, age, stage of disease, histological type, performance status, former psychological symptoms, co-morbidity and socioeconomic background, residual confounding might still explain the observed effects. Kurtz et al. [17] controlled for age, sex, symptom severity, physical and social functioning, co-morbidity, stage of diagnosis and type of treatment and found that symptom severity and social functioning were the only predictors of depression. Kurtz et al. [17] also controlled for age, sex, symptom severity, physical and social functioning, co-morbidity, stage of diagnosis and type of treatment and found that symptom severity and social functioning were the only predictors of depression. The very poor prognosis for lung cancer raises the possibility that positive effects of interventions
were observed in only a few atypical persons, as many died during follow-up. Furthermore, persons who participate in surveys may differ substantially from those who choose not to participate [28,29], indicating a risk for selection bias. This methodological problem is illustrated in the study of Uchitomi et al. (2003) [21], who lost 50 out of 212 persons to follow-up, mainly because they refused to participate owing to psychological or physical problems associated with their disease. The prevalence of depression may therefore have been underestimated in this study.

Another bias that can arise in randomised trials is that patients allocated to the control group report reduced general well-being, because they are disappointed by their allocation [30]. In two of the randomised studies [22,24], the intervention was not only psychosocial but also included a clinical assessment, which might have influenced the positive association between the intervention and depression. In the case-control study, the cases and controls were not comparable with regard to functional ability, respiratory volume or sex distribution, again raising the possibility of selection bias, as the prevalence of depression in the two groups might have been affected by these factors.

As depression and anxiety are not stable states of mind, measurement of these conditions on the day of diagnosis might not indicate the association with the cancer diagnosis during the subsequent period before beginning of treatment. As the follow-up period varied from 8 weeks [23] to 1 year [14,16,17,21,24], the information on the short- and long-term psychosocial effects of a lung cancer diagnosis was somewhat heterogeneous. Furthermore, depression and anxiety might be the first symptoms of lung cancer, thereby introducing some misclassification.

Although the patients in the four Japanese studies included in our review [18–21] were sampled from the same hospital, we excluded any redundancy as the groups of lung cancer patients included in each study were clearly described.

Depression was measured on a variety of scales in the studies we reviewed. Those most frequently used were the Hospital Anxiety and Depression Scale [6,15,18,23,25], the Centre for Epidemiological Studies Depression Scale [17], the Profile of Mood States [20-22] and the third revised edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R) [18,20,21], all of which are validated and used for cancer patients. They are not, however, comparable. The DSM-III-R is a diagnostic tool, while the three other scales are used for screening, raising the possibility that the prevalence of depression diagnosed on the basis of DSM-III-R is lower than that of depression diagnosed by screening. This consideration is consistent with our finding of a low prevalence of depression in studies in which DSM-III-R was used (5–8%) [18,20,21] and the highest level of depression in studies in which the Hospital Anxiety and Depression Scale (22–33%) [6,15] and the Centre for Epidemiological Studies Depression Scale (average, 35%) [17] were used. Some of the reports did not distinguish between borderline depression and true depression, a potential source of misclassification.

If more extensive psychosocial intervention programmes are to be implemented for persons with lung cancer, more information is needed about the mechanisms underlying depression and reduced well-being in these persons. Additional studies are needed to establish who is at risk, how different persons react to a diagnosis of lung cancer, the duration of depression or anxiety and what is needed. Larger, unselected populations should be studied to ensure adequate statistical power, and detailed information should be obtained about possible confounders; the psychometric instruments used should be identified as being designed for screening or for a definitive diagnosis. On the assumption that most studies will consist of small clinical samples, the populations should be relatively homogeneous with regard not only to factors such as sex and histological type of tumour but also to stage of disease and co-morbidity.

We recommend that screening for and treatment of depression become an integral part of the treatment offered to patients with lung cancer, as in all the studies in our review a high percentage of the participants (average, 25%) had depression or other psychosocial problems. All persons with a diagnosis of lung cancer might benefit from psychological screening, as this would identify those who are already depressed and those at risk of becoming depressed. Patients could benefit from psychosocial intervention programmes tailored to their needs, ranging from palliation to targeted programmes for different cultural and social contexts.

Acknowledgement

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