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Financial Consequences for Patients Suffering from NSCLC Stage I-IIIA

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ABSTRACT

Background: Up to 82-36% of all non small lung cancer patients will survive their disease. For these long term survivors return to work and consequently financial consequences seems to be a relevant question regarding quality of life. On the other hand, no studies are available addressing the question of financial distress based on objective data. This study is, to our knowledge, the first one which analyzed financial consequences for NSCLC patients regarding the objective database of a German pension insurance (Deutsche Rentenversicherung Hessen (DRV-Hessen) and not by a questionnaire which is answered by patients.

Methods: After screening of 582 patients, 236 patients were asked to report their income. 46 patients gave their informed consents to analysis their data regarding the database of a German pension insurance.

Results: NSCLC patients stages I to stage III A are threatened by "financial distress". The groups of patients with successful "return to work" and patients with no "return to work" show a significant difference in terms of financial development

INTRODUCTION

Due to improved therapy options the overall survival rate of all cancer patients had risen to 60%. Therefore the number of long-term survivors is steadily increasing [1]. NSCLC patients I-IIIA UICC shows a 5 year overall survival of 82-36%. [2]. These patients are still suffering from a variety of interrelated physical and mental health problems. In consequence, financial and social status may also suffer mainly due to the resulting limited work capacity. A Norwegian study showed on 34000 patients that cancer patients achieved in median 12% less income than patients in the same age and the same educational level. Especially lung cancer patients suffer from this development [3]. Data of a health insurance in Germany (AOK) could show in case of cancer illness the risk of retirement is significant higher compared with a same age of non cancer patients. This was seen in men clearer than in women [4]. In a French study, cancer patients reported that financial distress was more important to them in terms of quality of life than physical or psychological side effects of cancer or its therapy [5].

In addition to the negative effect on quality of life, there are initial data that also showed a negative impact on the prognosis of patients suffering from a financial distress during the illness. As an analysis of 16 clinical studies of lung, ovarian and breast cancer patients outlined, "financial distress" in cancer patients reduces quality of life but also overall survival [6]. The financial consequences for patients with

Localized or locally advanced NSCLC has not been investigated in detail. The present study is thus the world's first investigation to addressing this question. Particularly noteworthy is that the financial consequences were evaluated on the basis of the database of the German pension insurance (DRV Hessen) and not on the basis of questionnaires.

MATERIAL AND METHODS

From 01/2010 b is 04/2015 582 patients suffering from NSCLC I-IIIA who meet the inclusion criteria were screened in two different clinics. 236 patients full field the inclusion criteria (s. below)

Inclusion criteria

- Patient has underwent an operation caused by a NSCLC Stad I-IIIA no longer than 12 months ago
- Age under 65

These 236 patients were asked by questionnaire regarding their social circumstances and if an analysis of their social data (income, unemployment benefits, pensions, etc.) was allowed to do. The social data included total financial income before and 1 year after the diagnosis. This analysis was done by the database of the pension insurance company (DRV-Hessen). Which means that these data are objective and did not based on patients meaning.

46 patients agreed to this analysis. On basis of these 46 patients we did our analysis.

The statistical analysis was done with IBM SPSS Statistics Version 23 for Windows.

The comparison of the financial income was done with UNIANOVA as Ancova.

P-value was calculated by t-test and a p-value under 0,05was classified as significant.

The study was proofed and rated positive by the ethic committee of the university clinic Marburg.(AZ 96/14)

RESULTS

46 valuable questionnaires out of 582were answered during the course and returned. This means a returning rate of 7.9%, 48% of patients were admitted to work after therapy (22 out of 46). 24 patients (52%) did not have a job. Out of this group, 16 received a disability pension. In addition, 4 patients received sickness benefit, 3 persons received an early retirement pension. One person was registered as unemployed.

It is important to note that the group of patients who did not have any work at the time of the survey included 11 patients who were of working age but who had social benefits or a pension before their cancer. Thus, in the group of patients with no return to work, 13 persons remained who could not resume their activities after rehabilitation, even though they had a job prior to their cancer diagnosis. In the group of patients who were able to resume their work, all patients at the time of diagnosis went to regular work. This means that 63% of those who did have a regular job at the time of their cancer diagnosis were able to return to the same occupation after completion the treatment. 73% of patients who achieved the "return to work" returned after their rehabilitation without changes in their occupation, 13% took a job change without reducing income, 9% reported a reduction in the number of hours in the former job and only one (5%) did a job change with a reduction in number of working hours. Twenty out of 22 patients (90%) who started work again were satisfied with their job and had no conflicts with colleagues. In the group of patients who had not returned to work by the time of the survey, only 25% of patients were satisfied with their job.

The age of the "return to work group" was on average 53.9 years, around 5 years lower than that of patients without a job (on average 59.2 years). Among the 21 patients who were able returning to work, showed 8 NSCLC stage I (4 each with IA and IB), 9 patients stage II (7 with IIA and 2 with IIB) and 4 NSCLC IIIA. The 22 persons who were out of work after rehabilitation were divided as follow: stage I 11 patients (9 with IA and 2 with IB), 5 patients with NSCLC II (3 with IIA and 2 with IIB) and 6 patients in the stage IIIA.

Regarding the education level, half of the patients in both groups (12/22 vs. 13/24) had a primary school certificate. In the group of returnees 6 out of 22 patients (27%) had graduated high school, while in the group of unemployed and pensioners 1 out of 24 respondents (4%). 5 out of 24 (21%) of the patients who failed to return to work did not have a degree. Concerning workload, 8 reported medium / heavy activities, 3 light ones. 13 out of 24 gave no information. In the group of patients with a "return to work", 9 patients indicated easy, 13medium or heavy workload (Table 1).

Financial Consequences for Patients Suffering from NSCLC Stage I-IIIA. Physical Medicine & Rehabilitation Journal. 2019; 2(1):116.

Table1: Patients characteristics.

Characteristics	Return to work	No Return to work	*P*-value
Male	14	17	0,444
Female	7	5	
Median age	53,9	59,2	<0,001
NSCLC stage I	8	11	0,369
NSCLC stage II	9	5	
NSCLC stage III	4	6	
Easy workload	9	3	0,45
Medium or heavy workload	13	8	
Primary school degree	16	18	0,013
High school degree	6	1	
No degree	0	5	
Satisfied with occupation	20	6	0,008

EVALUATION OF SALARY DATA

In total, the salary data of 21 persons from the group of patients with successful "return to work" and 22 persons from the group of patients without a workplace after rehabilitation could be collected via the database of the German pension insurance.

On one hand, the income was determined at the time of the lung cancer diagnosis and on the other hand the income after completion of the rehabilitation and successful social reintegration. A relevant salary loss was observed mainly in the collective of those who did not find their way back to work.

The financial losses were in this group with an average loss of 565 € per patient with a range of 275 until to 2340€, while the patients with a successful return to work earned on average 70,40€ more (range -525€ to + 441€) ($p<0,001$).This can be explained by salary increases or salary adjustments.

Due to the German pension system, the financial losses are directly related to the amount of income prior to the granting of a disability pension. This pension was calculated in relation to previous income.

The relatively highest losses were suffered by patients who practiced a profession at the time of diagnosis and slipped into the disability pension due to their illness. The group of patients (9 persons) who did not show any financial losses either received a disability pension or unemployment benefit at the time of NSCLC diagnosis.

DISCUSSION

In the present study it could be shown that patients with a localized or locally advanced NSCLC who are not able to returning to work, had to accept an average financial loss of 565 €,while the patients with a successful return to work earned on average 70,40€. 63% our patients are able to return in their former professional activity. This is in line with the results of the reviews done by Mehnert et al [7] and Spelten et al [8]. In the study done by Earle et al [9] 74% of lung and colon cancer patients returned to work. Even these data support our findings. Similar the results shown by Fantoni et al [10] are comparable to our data. In the Fantoni study breast cancer patients had to change their jobs in 15%, while 4 out of 22 cases (18%) the return of work was done by changing the job. This is also similar to results by Amir et al [11], who reported that 8% of breast cancer patients had to change their occupation due to their disease. According to a separate survey, 36% reported they had to reduce their workload at the expense of their income due to the consequences of their illness [12]. According to the results of our survey, the greatest financial incisions were seen in patients who were in employment before their illness and who received a disability pension after completing their rehabilitation. Earle et al were able to show that patients suffering from lung cancer lose their jobs more often than patients with colon carcinoma [9]. A study in Korea found that lung cancer patients lose their work on average 27 months after diagnosis. The average duration of abandonment was 45.7 months for other tumor patients [13]. Contrary to these results, we found no lower rates of reintegration for patients with non-small cell lung cancer. This could be explain by the fact that all these patients were

treated in a cancer rehabilitation. In these clinics return to work is one important goals of treatment.

In our study, the patient age was one of the prognostic factors for a successful return to work. Thus, on average, there were 5.3 years between the groups of returnees and those who changed to the disability pension or retirement pension. This finding is seen in different previous studies [14,15], where older age leads to an increased risk of unemployment after cancer. However old age leads to increased risk of unemployment in healthy controls too. The present study found no significant association between tumor stage at diagnosis and chances to return to work. Although the group of patients returning to work stage I and II was larger than those with stage III. 4 out of 10 patients with stage III managed to resume occupational activity. In contrast Earle et al showed that patient in stages I and II less often lose their jobs due to their disease than patients in tumor stage III [9]. In our investigation satisfaction and lack of conflict at place of employment were prognostic factor regarding return to work. 90% of our patients who reported no conflicts at work and who were satisfied with their occupation did a successful return to work. This result is in line with the findings from Mehnert [7,15], who described job satisfaction and the absence of stressors in the work environment as an important positive factors for a patient's desire to return to work. In a former own investigations, we showed [12,16] that a moderate and severe work is a risk factor for financial losses due to a tumor disease. This trend cannot be confirmed by the results of this study (p-value 0.45).Even these findings could be explained by the circumstance that all these patients underwent rehabilitation (s. above).

Earlier et al [9], Lauzier et al [17] or Singer [18] showed that patients with low education showed a high risk for financial distress. Our study also confirms this finding. Patients in our study who managed their "return to work" showed a higher education level (25% high school) than the patients who did not achieve a return to work (4% high school) In contrast Waldmann et al [19] report that the educational level of cancer patients had no influence on the risk of financial difficulties.

Based on the data, we are able to demonstrate that losing the job after NSCLC stage I-III Aor its therapy always leads to a significant reduction in salary, and finally in quality of life. On average, the patients of our examination, who had to give up their job due to the disease, lose 565 €. This is a significant difference to the patients who were able to return to their profession. Similar results are reported by Arozullah et al [20] in breast cancer patients. In this study the monthly average income loss was 646 €.

A weakness of this study is a returning rate of only 7.9% of the questionnaires. This could be explained on one hand by the fact that patients have to offer their whole socioeconomic data to the investigators. On the other hand a part of the patients suffer from progressive disease and are not able or not motivated to answer the questions. But the low returning rate may lead to selection bias. In summary, patients with non-small-cell lung cancer stage I to stage III A are threatened by "financial distress". The groups of patients with successful "return to work" and patients with no "return to work" showed a significant difference in terms of financial development. Regarding quality of life one treatment goal should be a successful return to work. This should be discussed during the therapy decision, because a pneumonectomy i.e., results regularly in a disability pension, even in patients with a physical severe occupation.

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