

Urszula Łopuszańska¹, Magdalena Derewianka-Polak¹, Grażyna Balicka², Marek Sawicki²,
Marta Makara-Studzińska¹

Received: 30.09.2015

Accepted: 15.10.2015

Published: 30.10.2015

Depression and suicidal thoughts in lung cancer patients awaiting surgery

Depresja i myśli samobójcze u pacjentów z rakiem płuc oczekujących na zabieg chirurgiczny

¹ Department of Applied Psychology, Medical University of Lublin, Poland

² Chair and Department of Thoracic Surgery, Medical University of Lublin, Poland

Correspondence: Urszula Łopuszańska, Zakład Psychologii Stosowanej Uniwersytetu Medycznego w Lublinie, ul. Chodźki 15, 20-093 Lublin, tel.: +48 81 448 66 00, e-mail: urszula.lopuszanska@umlub.pl

Abstract

Aims of the study: An assessment of the incidence and severity of suicidal thoughts and depression in a group of patients with lung cancer. Furthermore, we have investigated whether the increase in suicidal thoughts and depression depends on pain intensity and the overall physical function of patients. **Material and methods:** The study included 62 patients diagnosed with lung cancer, hospitalised in the Department of Thoracic Surgery at the Thoracic Surgery Clinic in Lublin, at the Independent Public Clinical Hospital No. 4 in Lublin. The patient population included 21 females (34%) and 41 males (66%). A total of 35 (56%) respondents came from rural regions, and the remaining 27 (44%) from the city. The average age was 59 years (standard deviation was 12.6). The severity of depression and suicidal thoughts was evaluated using the Beck Depression Inventory. In addition, Numeric Pain Intensity Scale and the Karnofsky Scale were used to assess the general functioning of the study population. Sociodemographic variables were analysed using a self-designed survey. **Results:** Suicidal thoughts occurred in 6.45% of respondents, exclusively in males. Statistical analysis showed that the group with depression received significantly less points in a scale measuring general functioning. There was a negative correlation between depression severity and the general functioning of patients. Depression was diagnosed in 32.25% of respondents, including mild in 25.8%, moderate in 6.45%, and severe in 4.83%. Depression affected 36.58% of men and 23.8% of women. No correlation between the severity of depression and the severity of pain was observed. **Conclusions:** The severity of depression increases with the decrease in overall physical functioning and is not related to pain severity.

Key words: lung cancer, suicidal thoughts, depressive disorders

Streszczenie

Celem badań było określenie częstości występowania oraz stopnia nasilenia myśli samobójczych, a także stopnia występowania i nasilenia depresji w grupie osób z rozpoznany rakiem płuc. Ponadto autorzy analizowali, czy stopień nasilenia myśli samobójczych oraz depresji zależy od stopnia nasilenia bólu, jak również stanu ogólnego funkcjonowania pacjentów. **Materiał i metody:** W badaniu wzięły udział 62 osoby, pacjenci ze zdiagnozowaną chorobą nowotworową płuc przebywający na Oddziale Torakochirurgii w Klinice Klatki Piersiowej w Lublinie, Samodzielnego Publicznego Szpitala Klinicznego nr 4 w Lublinie. Wśród nich było 21 kobiet (34%) oraz 41 mężczyzn (66%). Trzydzieści pięć (56%) osób pochodziło ze wsi, pozostałe 27 (44%) z miasta. Średnia wieku wynosiła 59 lat (odchylenie standardowe 12,6). Do zbadania stopnia nasilenia depresji i występowania myśli samobójczych posłużono się Inwentarzem Depresji Becka. Dodatkowo wykorzystano Numeryczną Skalę Nasilenia Bólu oraz Skalę Karnofsky'ego do oceny stanu ogólnego funkcjonowania badanych osób. W celu określenia zmiennych socjodemograficznych posłużono się ankietą autorską. **Wyniki:** Myśli samobójcze wystąpiły u 6,45% badanych, wyłącznie u mężczyzn. Analiza statystyczna wykazała, że grupa osób z depresją otrzymała istotnie mniej punktów w skali mierzącej ogólne funkcjonowanie (Skala Karnofsky'ego). Wystąpiła negatywna zależność między nasileniem depresji a ogólnym funkcjonowaniem pacjentów. Depresję rozpoznano u 32,25% badanych, z czego u 25,8% miała ona charakter łagodny, u 6,45% umiarkowany, a 4,83% ciężki. Depresja występowała u 36,58% mężczyzn i u 23,8% kobiet. Nie zaobserwowano zależności między nasileniem depresji a nasileniem odczuwanego bólu. **Wnioski:** Nasilenie depresji zwiększa się wraz ze spadkiem ogólnego funkcjonowania fizycznego i nie jest powiązane z nasileniem dolegliwości bólowych.

Słowa kluczowe: rak płuc, myśli samobójcze, zaburzenia depresyjne

INTRODUCTION

In 2012 there were 8.2 million deaths due to cancer in the world. Lung cancer is the most common cause of death in this population, with approximately 1.59 million deaths per year. The incidence of this type of cancer increases each year (World Health Organization, 2015). The problem primarily affects men (approximately 80% of patients), however, it becomes increasingly common in women. The highest incidence is observed in individuals between 55 and 70 years of age (Rzyman, 2008).

The mortality rate is still high in lung cancer. Only 10–14% of patients have a chance of 5-year survival (Rzyman, 2008). Cancer involves a number of negative health consequences and causes suffering, not only in the physical dimension of health, but also in the mental one. It requires significant psychological resources not only from the suffering person, but also from the medical personnel and the patient's family (Edwards and Clarke, 2004). In the emotional dimension, cancer increases anxiety, depression, exasperation and sometimes aggression. Mental balance of a patient can be disturbed and it largely depends on the treatment process (Yang *et al.*, 2014). It is a known fact that the psychological condition of a cancer patient is particularly important for the entire treatment and future prognosis (Gregurek *et al.*, 2010). Deterioration in the mental status involves weakening decrease in both motivational processes as well as activities aimed at appropriate treatment initiation (Murawiec, 2012).

Cancer often contributes to the deterioration of psychophysical condition, and it directly affects the life situation by excluding the patient from professional life, thus worsening their financial situation. These factors may lead to a greater risk of depressive disorders and sometimes may increase the risk of suicide (Majkowicz, 2008).

Lung cancer patients are at risk of depressive disorders and suicide (Anguiano *et al.*, 2012). The aim of this study was to analyse the incidence of depressive disorders and suicidal thoughts among lung cancer patients awaiting a surgery.

MATERIAL AND METHODS

A total of 62 patients participated in the study, including 21 females (34%) and 41 males (66%). The patients were scheduled for a surgery in the Department of Thoracic Surgery at the Thoracic Surgery Clinic in Lublin, at the Independent Public Clinical Hospital No. 4 in Lublin. The inclusion criteria included a voluntary, written consent to participate in the study, and the lack of neurological diseases or mental disorders confirmed in the clinical interview. The study received Bioethics Committee approval No. KE-0254/204/2015.

The average age of patients was 59 years (± 12 years), 55 years in women, and 61 years in men. This difference was found to be statistically significant. A total of 35 (56%) respondents came from rural regions, and the remaining 27 (44%) from the city. Beck Depression Inventory was used to assess the severity of depression and suicidal thoughts; depressive disorders

were diagnosed in patients with a total score greater than 11. Additionally, Numeric Pain Intensity Scale and the Karnofsky Scale were used to assess the general functioning of the study population. Sociodemographic variables were evaluated using a self-designed survey.

The obtained results were analysed statistically using STATISTICA software, version 10. Due to the lack of normal distribution of several variables and different group sizes of the study groups, correlations between variables were calculated using Spearman's rank correlation coefficient. Testing of the hypotheses was performed using the Mann–Whitney *U* test. A significance level of $p < 0.05$ was accepted.

RESULTS

Suicidal thoughts were observed only in men. Four of them (6.45% of all respondents) admitted that they had thoughts about taking their own life, however, they were unable to do this. Hypothesis testing using the Mann–Whitney *U* test showed that people who scored more than 11 points on the Beck Depression Inventory also scored significantly less points on the scale measuring general functioning (Karnofsky Scale) ($p < 0.01$). Such correlations were not observed in the Numeric Pain Intensity Scale ($p < 0.11$).

Depression was diagnosed in 32.25% of respondents, including mild in 25.8%, moderate in 6.45%, and severe in 4.83%. Depression was more common in men (36.58%) than in women (23.8%). A detailed distribution of depressive disorders is shown in Figs. 1 and 2.

When evaluating Spearman's rank correlation between the measured variables, it was observed that the number of points received in the Beck Depression Inventory increases with a decrease in the number of points on the Karnofsky Scale

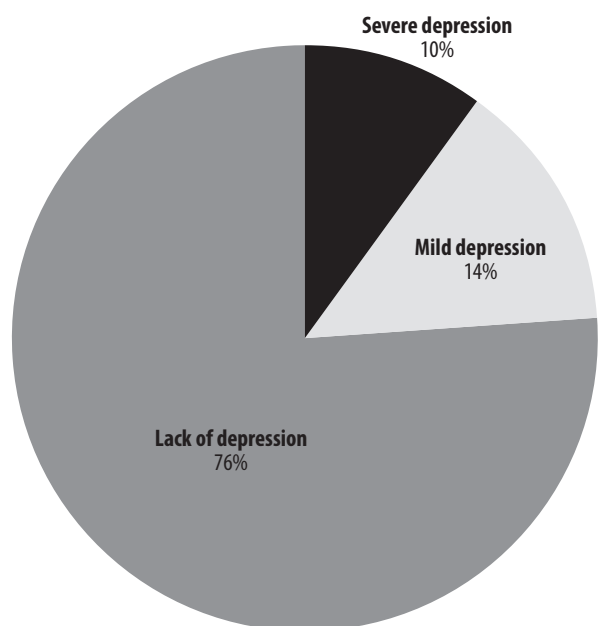


Fig. 1. Depression diagnosis using Beck Depression Inventory in the group of women

($p < 0.01$), however, such correlations were not observed in the Numeric Pain Intensity Scale ($p < 0.09$). However, there was a negative correlation between Karnofsky Scale and the Numeric Pain Intensity Scale, which indicates that the increase in pain was accompanied by a reduction in the general physical functioning of patients ($p < 0.000001$). Correlations between the measured variables are given in Tab. 1. There was no correlation between the number of years of education or the number of years of smoking tobacco and the number of points on the Karnofsky Scale, Numeric Pain Intensity Scale, or Beck Depression Inventory. It was shown, however, that the individuals who assessed their economic situation as good scored more points on the Karnofsky Scale ($p < 0.04$) compared to those who described their financial situation as difficult. There was no difference between rural and urban residents in terms of scores in the Beck Depression Inventory, Karnofsky Scale or Numeric Pain Intensity Scale ($p < 0.94$, $p < 0.91$, $p < 0.55$, respectively).

DISCUSSION

As shown by studies conducted in the United States over a period of 30 years in the group of 3,594,750 people, the risk of suicide in patients with cancer is almost twice the risk of suicide in healthy individuals. The high-risk group includes patients diagnosed with lung cancer, gastric cancer, oral cavity and pharynx cancer. Additionally, it was shown that the risk is affected by: sex (male), age (the risk increases with age) and race (more common in the Caucasian race) (Misono *et al.*, 2008). Similar trends were observed in our study. Suicidal thoughts occurred only in men. However, this correlation did not increase with age in our study.

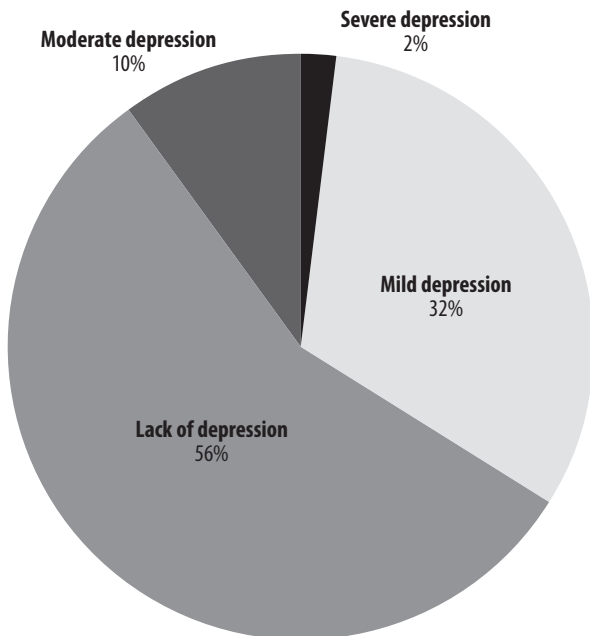


Fig. 2. Depression diagnosis using Beck Depression Inventory in the group of men

	R-Spearman	p
Age and Karnofsky Scale	0.1245	0.3349
Age and Pain Scale	-0.0514	0.6910
Age and Beck Depression Inventory	-0.0149	0.9078
Age and suicidal thoughts	-0.0404	0.7552
Karnofsky Scale and Pain Scale*	-0.5686	0.000001
Karnofsky Scale and Beck Depression Inventory*	-0.3193	0.0113
Karnofsky Scale and suicidal thoughts	-0.0329	0.7992
Pain Scale and Beck Depression Inventory	0.2161	0.0915
Pain Scale and suicidal thoughts	0.0000	1.0000
Beck Depression Inventory and suicidal thoughts	0.1984	0.1220

Tab. 1. Spearman's rank-order correlation in group of 62 patients

The study on the prevalence of depression and depressive thoughts in a group of cancer patients presents a number of methodological difficulties. The used research tool and the time of the study are one of the variables for diagnosis. Thus, the percentage of patients diagnosed with depressive disorders differs, depending on the studies performed. According to Massie (2004), the prevalence rate in lung cancer patients varies from 11 to 44%. In our study, the analyses were conducted immediately prior to surgery, and depressive disorders were diagnosed in 32.25% of patients, of whom 36.58% were men and 23.8% were women.

British studies conducted among 21,151 oncological patients showed that patients with lung cancer accounted for the largest percentage of individuals with depression, i.e. in 13.1%. Furthermore, depression was diagnosed more often in younger people, especially in women (Vijayvergia *et al.*, 2015). It is emphasized in many scientific publications that people suffering from lung cancer are more vulnerable to depression, however, variables that promote these disorders differ depending on culture, origin, etc. Generally, it is assumed that the risk factors of depressive disorders in cancer population include: male gender, advanced age, lung cancer and a very important factor – treatment prognosis (Dormer *et al.*, 2008).

Research shows that the general physical functioning of oncological patients and pain intensity contribute to the formation of suicidal thoughts (Akechi *et al.*, 2002; Recklitis *et al.*, 2006). Such relationships were not observed in our study, however, it was shown that the deterioration of the physical condition is accompanied by an increase in depressive disorders and that the physical state of patients is directly affected by pain intensity. This can result from the timing of patient assessment. Our analysis included patients immediately before surgery and the research suggests, that the greatest risk of suicide occurs in the first year after receiving a diagnosis (Miccinesi *et al.*, 2004; Yousaf *et al.*, 2005). However, Akechi (2000) also confirms that the deterioration of the general functioning of patients is associated with the risk of depressive disorders.

There are scientific publications highlighting sociodemographic factors relevant to the emergence of depressive thoughts and disorders in cancer population. The importance

of marriage is stressed, since it is assumed, that suicidal thoughts are more common in cancer patients who are lonely, single or divorced (Robson *et al.*, 2010). In our study it was not possible to verify this correlation due to an insufficient number of respondents. However, it was shown that the general condition of patients is affected by their economic status. Those who describe their financial situation as difficult had lower scores on the scale measuring general physical functioning. Australian studies conducted between 1996 and 2001 in a group of patients diagnosed with cancer (13 types in total) indicate that individuals with high economic status potentially live longer than those with low economic status, and significant correlations in this respect were found primarily in lung cancer patients (Yu *et al.*, 2008). Similar results were obtained by Smith *et al.* (1996). The authors focused on factors associated with lifestyle, noting that individuals with lower economic status were more often addicted to nicotine and their diet was lower in nutrients.

In our study, rural residents did not differ from urban residents in terms of pain intensity, general functioning or the severity of depression. Studies in this area are divergent and depend on health care organization and social life in the individual countries. Burriss and Andrykowski (2010) demonstrated in a group of 116 US citizens with cancer that urban residents show higher fear levels, greater symptoms of anxiety, depression and emotional problems compared to rural citizens. For the purpose of comparison, German studies in a group of 546 oncology patients after surgery showed that despite increased accessibility to specialist health care, urban residents have difficulties in relations doctor-patient when compared to rural residents (Beraldi *et al.*, 2015).

As already mentioned, the years of education have no effects on the overall functioning, pain intensity, or the severity of depression. However, it should be noted that there are studies highlighting that the ratio of deaths due to cancer is affected by the level of education – the higher the level the lower the mortality (Albano *et al.*, 2007; Hemminki and Li, 2003).

CONCLUSIONS

Cancer diagnosis is associated with experiencing severe stress, which increases the risk of depressive disorders. In the face of mental health crisis, the risk of suicidal thoughts increases, especially in men.

The more severe the pain experienced by patients, the worse the overall physical functioning, which has direct effects on the severity of depressive symptoms. Patients with lung cancer are particularly vulnerable to depressive disorders and suicidal thoughts. There is a need to take into account the psychophysical conditions of patients in the process of lung cancer treatment.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organizations which might negatively affect the content of this publication and/or claim authorship rights to this publication.

Piśmiennictwo / References

- Akechi T, Okamura H, Kugaya A *et al.*: Suicidal ideation in cancer patients with major depression. *Jpn J Clin Oncol* 2000; 30: 221–224.
- Akechi T, Okamura H, Nishiwaki Y *et al.*: Predictive factors for suicidal ideation in patients with unresectable lung carcinoma. *Cancer* 2002; 95: 1085–1093.
- Albano JD, Ward E, Jemal A *et al.*: Cancer mortality in the United States by education level and race. *J Natl Cancer Inst* 2007; 99: 1384–1394.
- Anguiano L, Mayer DK, Piven ML *et al.*: A literature review of suicide in cancer patients. *Cancer Nurs* 2012; 35: E14–E26.
- Beraldi A, Kukk E, Nest A *et al.*: Use of cancer-specific mental health resources – is there an urban-rural divide? *Support Care Cancer* 2015; 23: 1285–1294.
- Burriss JL, Andrykowski M: Disparities in mental health between rural and nonrural cancer survivors: a preliminary study. *Psychooncology* 2010; 19: 637–645.
- Dormer NR, McCaul KA, Kristjanson LJ: Risk of suicide in cancer patients in Western Australia, 1981–2002. *Med J Aust* 2008; 188: 140–143.
- Edwards B, Clarke V: The psychological impact of a cancer diagnosis on families: the influence of family functioning and patients' illness characteristics on depression and anxiety. *Psychooncology* 2004; 13: 562–576.
- Gregurek R, Bras M, Dordević V *et al.*: Psychological problems of patients with cancer. *Psychiatr Danub* 2010; 22: 227–230.
- Hemminki K, Li X: Level of education and the risk of cancer in Sweden. *Cancer Epidemiol Biomarkers Prev* 2003; 12: 796–802.
- Majkovicz M: Wybrane problemy psychoonkologii z uwzględnieniem zagadnień psychiatrycznych. *Psychiatria w Praktyce Klinicznej* 2008; 1: 57–66.
- Massie MJ: Prevalence of depression in patients with cancer. *J Natl Cancer Inst Monogr* 2004; (32): 57–71.
- Miccinesi G, Crocetti E, Benvenuti A *et al.*: Suicide mortality is decreasing among cancer patients in Central Italy. *Eur J Cancer* 2004; 40: 1053–1057.
- Misono S, Weiss NS, Fann JR *et al.*: Incidence of suicide in persons with cancer. *J Clin Oncol* 2008; 26: 4731–4738.
- Murawiec S: Depresja u osób z chorobą nowotworową. Rozpoznawanie i leczenie – aspekty praktyczne. *OncoReview* 2012; 2: 201–208.
- Recklitis CJ, Lockwood RA, Rothwell MA *et al.*: Suicidal ideation and attempts in adult survivors of childhood cancer. *J Clin Oncol* 2006; 24: 3852–3857.
- Robinson D, Renshaw C, Okello C *et al.*: Suicide in cancer patients in South East England from 1996 to 2005: a population-based study. *Br J Cancer* 2009; 101: 198–201.
- Robson A, Scrutton F, Wilkinson L *et al.*: The risk of suicide in cancer patients: a review of the literature. *Psychooncology* 2010; 19: 1250–1258.
- Rzyman W: Rak płuca. *Forum Medycyny Rodzinnej* 2008; 2: 407–419.
- Smith D, Taylor R, Coates M: Socioeconomic differentials in cancer incidence and mortality in urban New South Wales, 1987–1991. *Aust N Z J Public Health* 1996; 20: 129–137.
- Vijayvergia N, Shah PC, Denlinger CS: Survivorship in non-small cell lung cancer: challenges faced and steps forward. *J Natl Compr Canc Netw* 2015; 13: 1151–1161.
- World Health Organization: Cancer Report 2015. Available from: <http://www.who.int/mediacentre/factsheets/fs297/en/>, access 15.09.2015.
- Yang YL, Sui GY, Liu GC *et al.*: The effects of psychological interventions on depression and anxiety among Chinese adults with cancer: a meta-analysis of randomized controlled studies. *BMC Cancer* 2014; 14: 956.
- Yousaf U, Christensen ML, Engholm G *et al.*: Suicides among Danish cancer patients 1971–1999. *Br J Cancer* 2005; 92: 995–1000.
- Yu XQ, O'Connell DL, Gibberd RW *et al.*: Assessing the impact of socioeconomic status on cancer survival in New South Wales, Australia 1996–2001. *Cancer Causes Control* 2008; 19: 1383–1390.