

## Cancer and depression: a prospective study

L. SLOVACEK<sup>1,2\*</sup>, B. SLOVACKOVA<sup>3</sup>, I. SLANSKA<sup>2</sup>, P. PRIESTER<sup>2</sup>, J. PETERA<sup>2</sup>, J. KOPECKY<sup>2</sup>, J. VANASKOVA<sup>2</sup>

<sup>1</sup>University of Defence, Faculty of Military Health Sciences, Department of Field Internal Medicine, Hradec Kralove, Czech Republic, Trebesska street 1575, 50001 Hradec Kralove 1, Czech Republic, e-mail: ladislav.slovacek@seznam.cz; <sup>2</sup>Charles University Hospital and Faculty of Medicine, Department of Clinical Oncology and Radiation Therapy, Hradec Kralove, Czech Republic; <sup>3</sup>Charles University Hospital and Faculty of Medicine, Department of Psychiatry, Hradec Kralove, Czech Republic.

Received August 5, 2008

Cancer diagnosis and treatment often produce psychologic stresses resulting from the actual symptoms of the disease, as well as from perceptions of the disease and its stigma. Depression is seen in many cancer patients. Depression occurs in approximately 25% of palliative care patients. It is widely recognised by clinicians that depression is a difficult symptom to identify amongst patients with advanced illness.

The study is aimed for screening of depression among palliative care female patients. This study was local, prospective and cross-sectional. It was carried at Department of Clinical Oncology and Radiation Therapy of Charles University Hospital in Hradec Kralove, Czech Republic. Dates were obtained during year 2007 – 2008 in 64 palliative care female patients. The mean age for all 64 subjects was 60,5 years old (aged 29 – 88 years old). The Czech version of Zung self-rating depression scale was performed.

The statistical evaluation presents that mean SDS (self-rating depression score) certifies the presence of signs of mildly depression among palliative care female patients (SDS range was 50-59). The mean SDS in all subjects was 56. The mean SDS in group of healthy females was 38,9 (normal range). The incidence of depression is 71,8% (46 of all 64 subjects). The relevance of depression is characterized: severely depressed was proved in 8 of all 46 subjects, the moderately depressed in 21 subjects of all 46 subjects and mildly depressed in 17 of all 46 subjects. The statistical evaluation not presents statistically significant dependence of SDS on smoking abuse, marital status, age, number of associated diseases and type of palliative care. The statistical evaluation presents that patients with cancer of lung, with cancer of endometrium, with cancer of gallbladder and with melanomas are moderately depressed (SDS 60-69), patients with cancer of ovary, with cancer of breast, with primary brain tumour, with cancer of ventricle, with cancer of pancreas head and with cancer of buccal cavity are mildly depressed (SDS 50-59).

The results show that subsists clear association between oncological disease in palliative care and depression.

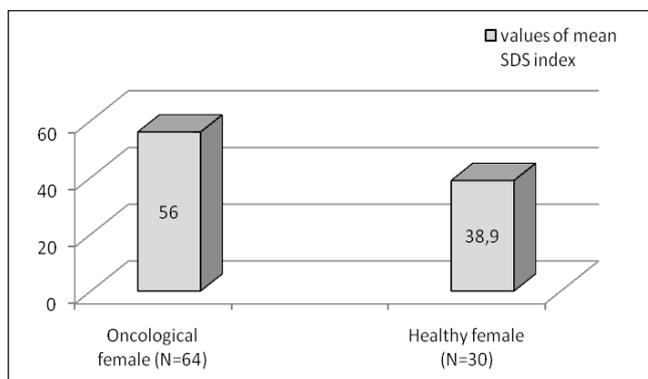
*Key words: cancer, palliative care, female, depression*

Cancer diagnosis and treatment often produce psychologic stresses resulting from the actual symptoms of the disease, as well as from perceptions of the disease and its stigma [1]. Depression is seen in many cancer patients [2]. Depression occurs in approximately 25% of palliative care patients [3–5]. It is widely recognised by clinicians that depression is a difficult symptom to identify amongst patients with advanced illness. This can lead to difficulties in the management of physical symptoms, such as pain, and also cause much distress to patients and their families [3, 4]. Many professionals working in palliative care are concerned that screening for depression may not be appropriate in

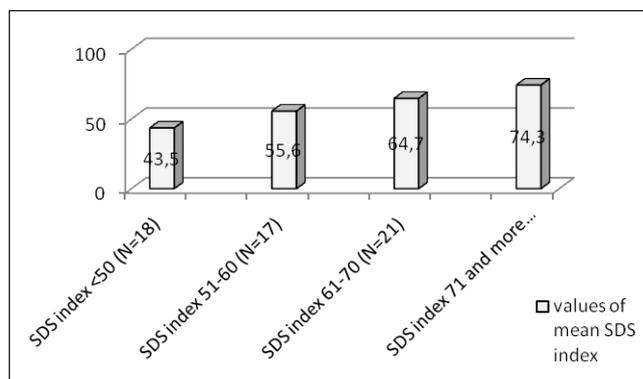
a population of patients whose illness is changing rapidly [3, 4]. Elderly cancer patients suffer significant psychological distress that should be recognized and effectively treated [6]. Physical symptoms of cancer must be distinguished from the neurovegetative symptoms of depression. They may be sifted out by asking about pain control, fatigue, insomnia, appetite, libido, and psychomotor activity [6].

The aims of the pilot study of depression were to analyse incidence and relevance of depression among palliative care female patients and to analyse an effect of selected demographics (age), psychosocial (marital status) and health (smoking abuse, number of associated diseases and type of palliative care – palliative chemotherapy, palliative radiation therapy, symptomatic therapy) aspects on relevance of depression.

\* Corresponding author



Graph 1. Comparison of values of mean SDS among palliative care female patients and healthy female (N=94,  $p < 0,05$ ).



Graph 2. Occurrence and relevance of depression among palliative care female patients (N=64).

## Patients and methods

**Type of study.** The study is prospective and cross-sectional. The dates were obtained during year 2007 – 2008. The study was approved the Ethics Commission of the Charles University Hospital and Faculty of Medicine in Hradec Kralove, Czech Republic.

**Study population.** All female patients scheduled for palliative care in the Department of Clinical Oncology and Radiation Therapy of Charles University Hospital and Faculty of Medicine in Hradec Kralove, Czech Republic between 1<sup>st</sup> October 2007 to 31<sup>st</sup> May 2008 were requested to participate in the study of depression.

The number of all palliative care female patients was 64. The mean age for all 64 subjects was 60,5 years old (aged 29–88 years old). The number of subjects with cancer of lung was 5, with sarcomas 1, with cancer of endometrium 11, with cancer of ovary 7, with cancer of breast 17, with intracranial or extracranial meningioma 4, with primary brain tumour 6, with cancer of rectum 4, with cancer of ventricle 2, with cancer of gallbladder 2, with melanomas 2, with cancer of pancreas head 2 and cancer of buccal cavity 1. The number of subjects treated with palliative radiation therapy was 29, with palliative chemotherapy 12 and with symptomatic therapy 23. The number of smokers was 11 and non-smokers 35. The number of married patients was 28, widows 10 and divorcee patients 8. The number of patients without associated disease was 3, with 1 associated disease 6, with 2 associated diseases 15, with 3 associated diseases 6 and with more than 3 associated diseases 16. No patient of all 64 patients was treated for depression and have not used antidepressants and anxiolytics. The number of healthy female (control group) was 30 and their mean age was 55 years old (aged 45-63 years old).

**Measurement.** The Czech version of Zung self-rating depression scale was performed (see Picture 1) [7]. The Zung self-rating depression scale is a short self-administered survey to quantify the depressed status of a patient. There are 20 items on the scale

that rate the four common characteristics of depression: the pervasive effect, the physiological equivalents, other disturbances, and psychomotor activities. There are ten positively worded and ten negatively worded questions. Each question is scored on a scale of 1-4 (a little of the time, some of the time, good part of the time, most of the time). The scores range from 25-100. 25-49 normal range. 50-59 mildly depressed. 60-69 moderately depressed. 70 and above severely depressed [7].

**Procedure.** The palliative care female patients were tested while hospitalized at the Department of Clinical Oncology and Radiation Therapy of Charles University Hospital in Hradec Kralove, Czech Republic. The filling in the Zung self-rating depression scale was voluntary and anonymous.

**Data collection, statistical methods.** The dependent variable was Zung self-rating depression scale (SDS). The independent variables were age, marital status, number of associated diseases, smoking abuse, type of palliative care (palliative chemotherapy, palliative radiation therapy, symptomatic therapy). Statistical analysis was performed with analysis of variance (ANOVA). The value  $p < 0,05$  was considered significant. Software STATISTICA Base version 7.1 for Windows was used for complete evaluating of dates.

## Results

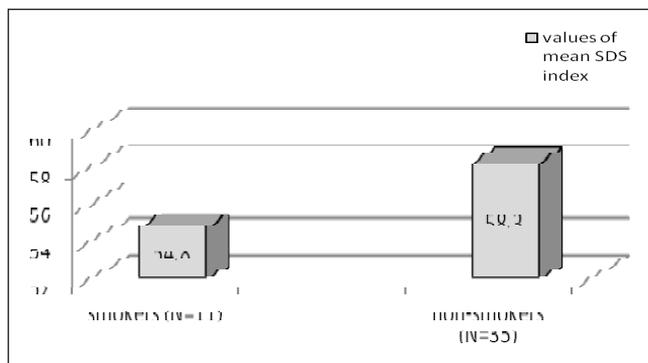
1. The statistical evaluation presents that mean SDS certifies the presence of signs of mildly depression among palliative care female patients (SDS range was 50-59). The mean SDS in all subjects was 56. The mean SDS in group of healthy females was 38,9 (normal range) (see Graph 1).

2. The incidence of depression is 71,8% (46 of all 64 subjects). The relevance of depression is characterized: severely depressed was proved in 8 of all 46 subjects, the moderately depressed in 21 subjects of all 46 subjects and mildly depressed in 17 of all 46 subjects (see Graph 2).

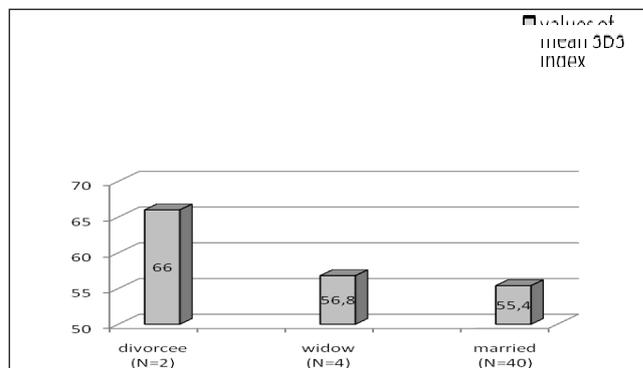
3. The statistical evaluation not presents statistically significant dependence of SDS on smoking abuse (N=46,  $p > 0,05$ )

<p><b>1. I feel down-hearted and blue</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>11. My mind is as clear as it used to be</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>
<p><b>2. Morning is when I feel the best</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>12. I find it easy to do the things I used to</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>
<p><b>3. I have crying spells or feel like it</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>13. I am restless and can't keep still</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>
<p><b>4. I have trouble sleeping at night</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>14. I feel hopeful about the future</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>
<p><b>5. I eat as much as I used to</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>15. I am more irritable than usual</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>
<p><b>6. I still enjoy sex</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>16. I find it easy to make decisions</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>
<p><b>7. I notice that I am losing weight</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>17. I feel that I am useful and needed</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>
<p><b>8. I have trouble with constipation</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>18. My life is pretty full</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>
<p><b>9. My heart beats faster than usual</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>19. I feel that others would be better off if I were dead</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>
<p><b>10. I get tired for no reason</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>	<p><b>20. I still enjoy the things I used to do</b></p> <p><input type="radio"/> A little of the time</p> <p><input type="radio"/> Some of the time</p> <p><input type="radio"/> Good part of the time</p> <p><input type="radio"/> Most of the time</p>

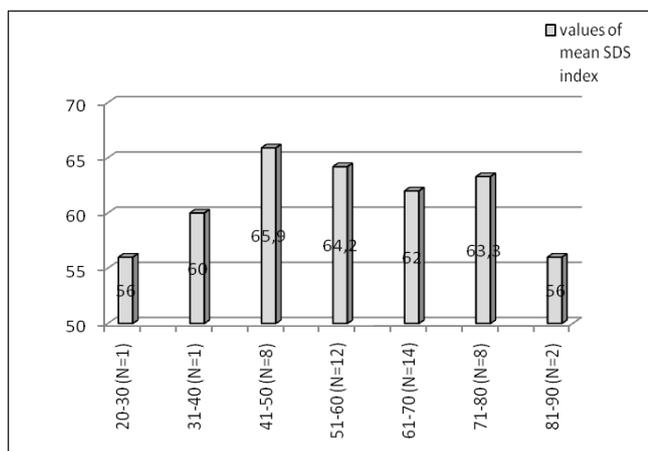
Figure 1. Zung self-rating depression scale [7].



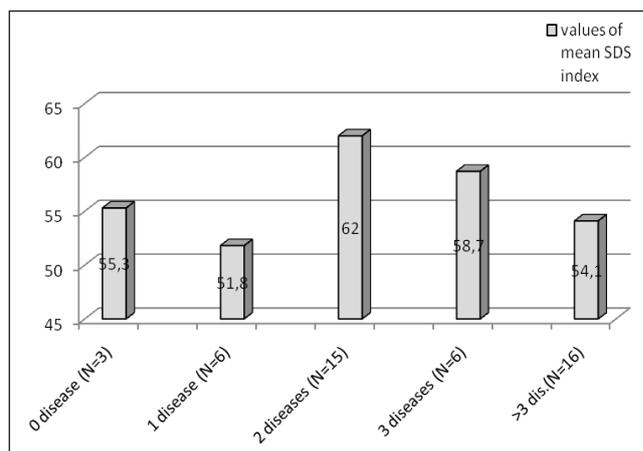
Graph 3. Comparison of values of mean SDS in dependence on smoking abuse among palliative care female patients with depression symptoms (N=46,  $p>0,05$ ).



Graph 4. Comparison of values of mean SDS in dependence on marital status among palliative care female patients with depression symptoms (N=46,  $p>0,05$ ).



Graph 5. Comparison of values of mean SDS in age groups of palliative care female patients with depression symptoms (N=46,  $p>0,05$ ).



Graph 6. Comparison of values of mean SDS in dependence on number of associated diseases among palliative care female patients with depression symptoms (N=46,  $p>0,05$ ).

(see Graph 3), on marital status among palliative care female patients with depression symptoms (N=46,  $p>0,05$ ) (see Graph 4), on age (N=46,  $p>0,05$ ) (see Graph 5), on number of associated diseases (N=46,  $p>0,05$ ) and on type of palliative care (N=46,  $p>0,05$ ).

4. The statistical evaluation presents that patients with cancer of lung, with cancer of endometrium, with cancer of gallbladder, and with melanomas are moderately depressed (SDS range was 60-69), patients with cancer of ovary, with cancer of breast, with primary brain tumour, with cancer of ventricle, with cancer of pancreas head and with cancer of buccal cavity are mildly depressed (SDS range was 50-59) (see Graph 7).

## Discussion

Cancer diagnosis and treatment often produce psychologic stresses resulting from the actual symptoms of the disease, as

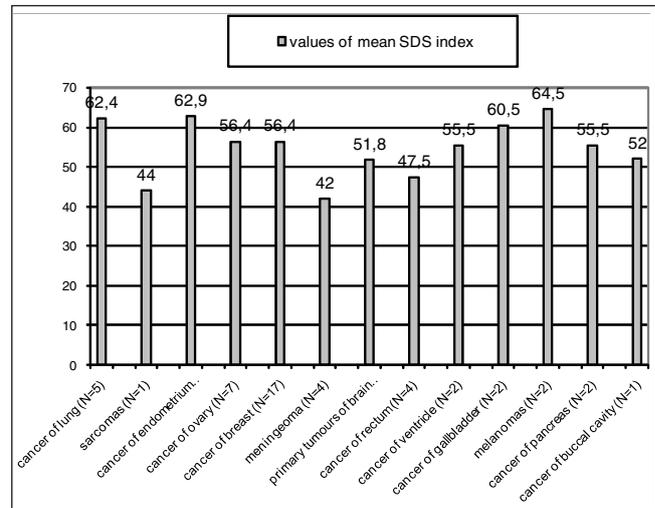
well as from perceptions of the disease and its stigma. Depression is seen in many cancer patients [3, 4]. Depression occurs in approximately 25% of palliative care patients [3, 4]. It is widely recognised by clinicians that depression is a difficult symptom to identify amongst patients with advanced illness. Depression, the psychiatric syndrome that has received the most attention in individuals with cancer, has been a challenge to study because symptoms occur on a spectrum that ranges from sadness to major affective disorder and because mood change is often difficult to evaluate when a patient is confronted by repeated threats to life, is receiving cancer treatments, is fatigued, or is experiencing pain [8]. However, depression in cancer has been essential to study because comorbid illnesses complicate the treatment of both and may lead to poor adherence to treatment recommendations and less desirable outcomes of both conditions [8]. The severity of medical illness, as manifested by significant pain, declin-

ing performance status, or the need for ongoing treatment, is associated with a high risk of comorbid depression. Whether high rates of depression associated with some cancers are caused by the pathophysiologic effect of the tumor (i.e., paraneoplastic syndromes associated with breast, testis, or lung cancers), treatment effects, or other unidentified factors remains to be described. Cancer, exclusive of site, is associated with a rate of depression that is higher than in the general population [8].

In our pilot study of depression, we found four main outcomes in evaluation incidence and relevance of depression and an effect of selected demographics, psychosocial and health aspects on relevance of depression among palliative care female patients.

*First*, our results had shown that mean SDS certifies the presence of signs of mildly depression among palliative care female patients (SDS range was 50-59). The mean SDS in all subjects was 56. The mean SDS in group of healthy females was 38,9 (normal range). We think that our results correspond to that oncological disease and its therapy is characterized by pain, sleep disturbances, dyspeptic difficulties, immobilization, low self-sufficiency and many others. These difficulties have a negative impact on patient's physic and mentally condition. Also, these difficulties are associated with psychological and social distress for patient's families. People with oncological disease in programme of palliative care have significant disability that also affects psychosocial and emotional aspects of their quality of life (QoL). It is an especially important issue in palliative care, as depression can be more common in patients who are at the end of life. Accurate assessment and treatment can have a powerful impact on improving a patient's QoL.

*Second*, our results had shown that incidence of depression in our evaluated group of subjects is 71,8 % (46 of all 64 subjects). The relevance of depression is characterized: severely depressed was proved in 8 of all 46 subjects, moderately depressed in 21 subjects of all 46 subjects and mildly depressed in 17 of all 46 subjects. The results of our prospective study supports Massie's [8] and Derogatis et al. [9] overview work. Massie [8] and Derogatis et al. [9] present that although many research groups have assessed depression in cancer patients since the 1960s, the reported prevalence (major depression, 0-38 %, depression spectrum syndromes, 0-58 %) varies significantly because of varying conceptualizations of depression, different criteria used to define depression, differences in methodological approaches to the measurement of depression, and different populations studied. We think that incidence of depression symptoms in our patients is high. Also, we think that high incidence of depression symptoms among our patients may be impressed with our minimal applications of antidepressants or anxiolytics (as co-analgetics) in therapy of cancer pain. These findings involve for us, that is a need of routine screening for depression among palliative care patients and its implementation of cost-effective treatment for those who need psychiatric services.



Graph 7. Comparison of values of mean SDS among palliative care female patients in individual type of cancers (N=64).

*Third*, our results not proved statistically significant correlation between SDS and smoking abuse, marital status, age, number of associated diseases and type of palliative care.

*Fourth*, our results proved that subjects with cancer of lung, with cancer of endometrium, with cancer of gallbladder and with melanomas are moderately depressed (SDS range was 60-69), patients with cancer of ovary, with cancer of breast, with primary brain tumor, with cancer of ventricle, with cancer of pancreas head and with cancer of buccal cavity are mildly depressed (SDS range was 50-59). The incidence of depression in an individual cancers are different. Cancer types highly associated with depression include oropharyngeal (22-57%) [10, 11], pancreatic (33-50%) [12, 13], breast (1,5-46%) [14, 15], and lung (11-44%) [16, 17]. A less high prevalence of depression is reported in patients with other cancers, such as colon (13-25%) [12, 18], gynecological (12-23%) [19-21] and lymphoma (8-19%) [22, 23]. Pinder et al. [24] found a 13 % prevalence of depression in advanced breast cancer patients (N=139), increased levels of depression were found in those with lowest socioeconomic status, poorest performance status, and closer proximity to death. Evans et al. [25] studied 83 women with gynecological cancer and found a 23 % prevalence of depression and 24 % prevalence of adjustment disorder with depressed mood. Golden et al. [26] found a 23 % rate of major depression in 83 hospitalized women with cervical, endometrial, and vaginal cancer. Hutton and Williams [27] studied 18 head and neck cancer patients and found that the degree of depression and distress decreased with increasing age. Hammerlind et al. [28] studied 357 head and neck cancer patients and found that patients who reported a higher level of mental distress and frequently scored as a possible or probable case of psychiatric disorder were patients who had lower performance status and more advanced

disease. In a study of depression and anxiety in 129 lung cancer patients, before and after diagnosis, Montazeri et al. [17] found that 10 % of patients had severe anxiety symptoms and 12 % had symptoms of depression at first presentation to their chest physician. Depression, but not anxiety, increased by 10 % at follow-up. Kramer [29] used Hospital Anxiety and Depression Scale (HADS) as an assessment measure and reported that 50 % of his sample of 60 patients with inoperable lung cancer were borderline depressed and 37 % were depressed. Joffe et al. [13] found a 33 % prevalence of major depression in patients with pancreas cancer. The reported prevalence of depression in patients with advanced cancer varies widely. Bukberg et al. [30] found that greater physical disability measured by the Karnofsky Rating Scale was associated with depression in their study of 62 patients with cancer. They found a 42 % overall prevalence of depression, but a range of from 23 % (in those with Karnofsky scores greater than 60) to 77 % (in those with Karnofsky scores less than 40). Breitbart et al. [31] found a 17 % prevalence of depression and a 17 % prevalence for a desire for hastened death in a study of 92 terminally ill cancer patients.

We subscribe with opinion of Lloyd-Williams [3, 4] which she emphasizes that the screening and diagnosis of depression in palliative care patients can help clinicians to help patients with depression or demoralization to have a better QoL. Reasons for failure to diagnose depression are misconceptions regarding low mood as being a normal part of a terminal illness and also the patients' reluctance to disclose their thoughts and feelings. Medical and nursing staff working within palliative care may also find difficulty in distinguishing between what could be called appropriate sadness and a treatable depressive illness. In an effort to improve the detection of depression, many professionals are using rating scales or tools in order to improve the diagnosis and treatment [32]. Also, we subscribe with opinion of Miller and Massie [33] which they emphasize that anxiety and depression are common in patients with cancer and in palliative care settings. These symptoms can be reactive to the illness or can be related to the direct physiologic effects of the disease or to drug therapies. Effective treatment of these symptoms includes both psychopharmacologic and psychotherapeutic approaches. The newer antidepressants, anxiolytics, and hypnotics are better tolerated and can be continued safely if necessary, or they can be reduced and discontinued as symptoms improve [33].

In the future, we would like to analyze incidence and relevance of depression among palliative care male patients and compare these values with an incidence and relevance of depression among palliative care female patients. We would like to analyze incidence and relevance of depression among palliative care patients using other depression scale (Hospital Anxiety and Depression Scale, HADS or Beck Depression Inventory, BDI) and its reciprocal comparison. Also, we would like to evaluate an effect of depression on global QoL.

We are also aware of the fact that our study can be limited by a few other factors:

1. The relatively small group of palliative care female patients.
2. The study deals only with the effect of selected aspects on relevance of depression. We could add a few other aspects (religion, level of education, effect of individual psychological intervention, effect of antidepressive and anxiolytic therapy i.e.).

In conclusion, depression is common in the general population and in adults and children with cancer and frequently coexists with anxiety and pain [8]. Depression has been challenging to study because symptoms occur on a spectrum that ranges from sadness to major affective disorder and because mood change is often difficult to evaluate when a patient is confronted by repeated threats to life, is receiving cancer treatments, is fatigued, or is experiencing pain. Untreated depression results in significantly increased morbidity and even mortality [8].

In summary, our study is the first investigation of screening of depression among palliative care female patients in our country. Our study is one of the few such studies carried out in countries within the former Eastern European bloc.

*Supported by the Research Project of the Ministry of Defence of the Czech Republic No. 0FVZ0000503 and the Research Project of the Ministry of Health of the Czech Republic No. 00179906.*

## References

- [1] ROTH AJ, MODI R. Psychiatric issues in older cancer patients. *Crit Rev Oncol Hematol*. 2003, 48: 185–197. [doi:10.1016/j.critrevonc.2003.06.004](https://doi.org/10.1016/j.critrevonc.2003.06.004)
- [2] Winell J, ROTH AJ. Depression in cancer patients. *Oncology (Williston Park)* 2004, 18:1554–1560, discussion 1561–1562.
- [3] Lloyd-Williams M, Reeve J, Kissane D. Distress in palliative care patients: Developing patient-centred approaches to clinical management. *Eur J Cancer* 2008, Mar 21 [Epub ahead of print].
- [4] Lloyd-Williams M, Riddleston H. The stability of depression scores in patients who are receiving palliative care. *J Pain Symptom Manage* 2002, 24: 593–597. [doi:10.1016/S0885-3924\(02\)00519-5](https://doi.org/10.1016/S0885-3924(02)00519-5)
- [5] Lloyd-Williams M. Is it appropriate to screen palliative care patients for depression? *Am J Hosp Palliat Care* 2002, 19:112–114. [doi:10.1177/104990910201900209](https://doi.org/10.1177/104990910201900209)
- [6] ROTH AJ. Understanding Depression in the Elderly Cancer Patient. *Journal Support Oncol* 2008, 6: 84–86.
- [7] ZUNG WW. A self-rating depression scale. *Arch Gen Psychiatry* 1965, 12: 63–70.
- [8] MASSIE MJ. Prevalence of Depression in Patients with Cancer. *Journal of the National Cancer Institute Monographs* 2004, 32: 57–71.
- [9] DEROGATIS LR, MORROW GR, FETTING J. The prevalence of psychiatric disorders among cancer patients. *JAMA* 1983, 249: 751–757. [doi:10.1001/jama.249.6.751](https://doi.org/10.1001/jama.249.6.751)

- [10] DAVIES ADM, DAVIES C, DELPO MC. Depression and anxiety in cancer undergoing diagnostic investigations for head and neck cancers. *Br J Psychiatry* 1986, 149: 491–493. [doi:10.1192/bjp.149.4.491](https://doi.org/10.1192/bjp.149.4.491)
- [11] Cavusoglu H. Depression in children with cancer. *J Pediatr Nurs* 2001, 16: 380–385. [doi:10.1053/jpdn.2001.0000](https://doi.org/10.1053/jpdn.2001.0000)
- [12] Fras I, LITIN EM, PEARSON JS. Comparison of psychiatric symptoms in carcinoma of the pancreas with those in some other intra-abdominal neoplasm. *Am J Psychiatry* 1967, 123:1553–1562.
- [13] JOFFEE RT, RUBINOW DR, DENICOFF KD et al. Depression and carcinoma of the pancreas. *Gen Hosp Psychiatry* 1986, 8: 241–245. [doi:10.1016/0163-8343\(86\)90004-6](https://doi.org/10.1016/0163-8343(86)90004-6)
- [14] SNEEUW KCA, AARONSON NK, van WOUWE MCC et al. Prevalence and screening of psychiatric disorder in patients with early stage breast cancer. *Qual Life Res* 1993, 2: 50–51.
- [15] Sachs G, Rasoul-Rockenschaub S, Aschauer H et al. Lytic effector cell activity and major depressive disorder in patients with breast cancer: a prospective study. *J Neuroimmunol* 1996, 784: 482–485.
- [16] Buccheri G. Depressive reactions to lung cancer are common and often followed by a poor outcome. *Eur Respir J* 1998, 11: 173–178. [doi:10.1183/09031936.98.11010173](https://doi.org/10.1183/09031936.98.11010173)
- [17] Montazeri A, Milroy R, Hole D et al. Anxiety and depression in patients with lung cancer before and after diagnosis: finding from a population in Glasgow, Scotland. *J Epidemiol Community Health* 1998, 52: 203–204. [doi:10.1136/jech.52.3.203](https://doi.org/10.1136/jech.52.3.203)
- [18] Koenig R, Levin S, BRENNAN MJ. The emotional status of cancer patients as measured by a psychological test. *J Chronic Dis.* 1967, 20: 923–930. [doi:10.1016/0021-9681\(67\)90028-8](https://doi.org/10.1016/0021-9681(67)90028-8)
- [19] EVANS DL, McCARTNEY CF, NEMEROFF CB et al. Depression in women treated for gynecological cancer: clinical and neuroendocrine assesment. *Am J Psychiatry* 1986, 143: 447–451.
- [20] GOLDEN RN, McCARTNEY CF, HAGGERTY JJ et al. The detection of depression by patient self-report in women with gynecological cancer. *Int J Psychiatry Med.* 1991, 21: 17–27.
- [21] Aass N, FOSSA SD, DAHL AA et al. Prevalence of anxiety and depression in cancer patients seem at the Norwegian Radium Hospital. *Eur J Cancer* 1997, 33: 1597–1604. [doi:10.1016/S0959-8049\(97\)00054-3](https://doi.org/10.1016/S0959-8049(97)00054-3)
- [22] Devlen J, Maguire P, Phillips P et al. Psychological problems associated with diagnosis and treatment of lymphoma. I: Prospective study. *BMJ* 1987, 295: 953–954. [doi:10.1136/bmj.295.6604.953](https://doi.org/10.1136/bmj.295.6604.953)
- [23] Devlen J, Maguire P, Phillips P et al. Psychological problems associated with diagnosis and treatment of lymphoma. II: Prospective study. *BMJ* 1987, 295: 955–957. [doi:10.1136/bmj.295.6604.955](https://doi.org/10.1136/bmj.295.6604.955)
- [24] PINDER KL, RAMIREZ AJ, BLACK ME. Psychiatric disorder in patients with advanced breast cancer: prevalence and associated factors. *Eur J Cancer* 1993, 29A: 524–527.
- [25] EVANS DL, McCARTNEY CF, NEMEROFF CB et al. Depression in women treated for gynecological cancer: clinical and neuroendocrine assesment. *Am J Psychiatry* 1986, 143: 447–451.
- [26] GOLDEN RN, McCARTNEY CF, HAGGERTY JJ et al. The detection of depression by patient self-report in women with gynecologic cancer. *Int J Psychiatry Med* 1991, 21: 17–27.
- [27] HUTTON JM, WILLIAMS M. An investigation of psychological distress in patients who have been treated for head and neck cancer. *Br J Oral Maxillofac Surg* 2001, 39: 333–339. [doi:10.1054/bjom.2001.0645](https://doi.org/10.1054/bjom.2001.0645)
- [28] Hammerlid E, Ahiner-Elmqvist M, Bjordal K et al. A prospective multicentre study in Sweden and Norway of mental distress and psychiatric morbidity in head and neck cancer patients. *Br J Cancer* 1999, 80: 766–774. [doi:10.1038/sj.bjc.6690420](https://doi.org/10.1038/sj.bjc.6690420)
- [29] KRAMMER JA. Use of the Hospital Anxiety and Depression Scale (HADS) in the assesment of depression in patients with inoperable lung cancer. *Palliat Med.* 1999,13: 353–354. [doi:10.1191/026921699666642790](https://doi.org/10.1191/026921699666642790)
- [30] Bukberg J, Penman D, HOLLAND JC. Depression in hospitalized cancer patients. *Psychosom Med* 1984, 46: 199–212.
- [31] Brietbart W, Rosenfeld B, Pessin H et al. Depression, hopelessness, and the desire for hastened death in terminally ill patients with cancer. *JAMA* 2000, 284: 2907–2911. [doi:10.1001/jama.284.22.2907](https://doi.org/10.1001/jama.284.22.2907)
- [32] Lloyd-Williams M. Screening for depression in palliative care patients: a review. *Eur J Cancer Care* 2001, 10:31–35. [doi:10.1046/j.1365-2354.2001.00244.x](https://doi.org/10.1046/j.1365-2354.2001.00244.x)
- [33] Miller K, MASSIE MJ. Depression and anxiety. *Cancer J* 2006, 12: 388–397. [doi:10.1097/00130404-200609000-00008](https://doi.org/10.1097/00130404-200609000-00008)