

УДК 159.9.07:616-006+615.84

М. В. Красносельський, О. О. Кирилова✉, Т. В. Рубльова, А. В. Свиначенко, С. В. Артюх

*ДУ «Інститут медичної радіології та онкології ім. С.П. Григор'єва НАМН України»,
вул. Пушкінська, 82, м. Харків, 61024, Україна*

ОЦІНКА ДИНАМІКИ ДИСТРЕСУ ТА ЯКОСТІ ЖИТТЯ ОНКОЛОГІЧНИХ ХВОРИХ НА ЕТАПІ ПРОМЕНЕВОЇ ТЕРАПІЇ І МОЖЛИВОСТІ ЇХ КОРЕКЦІЇ

Променева терапія (ПТ) є основним видом протипухлинного лікування у неоперабельних хворих. Низька поінформованість і страх перед розвитком променевих реакцій сприяють дестабілізації психоемоційного стану хворих, що може призвести до відмови від лікування і погіршення показників якості їхнього життя (ЯЖ). Незважаючи на неухильне зростання показників онкозахворюваності в Україні, наразі відсутні дослідження щодо розроблення заходів, спрямованих на покращення психологічного стану пацієнтів, які перебувають на лікуванні у відділеннях ПТ.

Мета: дослідження динаміки показників психоемоційного статусу та якості життя онкологічних пацієнтів на етапі променевого лікування.

Матеріали та методи. Проведено психодіагностичне дослідження 66 онкохворих, які проходили променево лікування у клініці ДУ «Інститут медичної радіології та онкології ім. С.П. Григор'єва НАМН України», з них до Групи 1 увійшли 44 хворих на рак голови та шиї, до Групи 2 – 22 хворих на колоректальний рак. Група порівняння – 30 респондентів умовно «здорових» без онкології. Усі пацієнти мали III–IV стадії захворювання. Були використані «Термометр дистресу», Шпитальна шкала тривоги та депресії (HADS), опитувальник SF-36 (Short Form). Обстеження проводилося до та після отримання курсу опромінення. Пацієнти Групи 1 проходили лише психодіагностику, пацієнти Групи 2 перед проходженням процедур опромінення, крім психодіагностики, отримували супровід психолога. У Групі порівняння анкетування проводилося 1 раз.

Результати та обговорення. Аналіз отриманих даних показав, що перед початком ПТ більшість випробуваних (72,73 % у Групі 1 та 77,30 % у Групі 2) мали високий рівень дистресу, вони хвилювалися та нервувалися перед першою процедурою опромінення, мали страхи щодо наслідків і побічних ефектів. Рівень тривоги за Групою 1 на патологічному і субклінічному рівнях був зафіксований у 54,55 % пацієнтів, показник депресії на субклінічному рівні діагностувався у 18,20 %, на клінічному – у 9,10 % хворих. У Групі 2 рівень тривоги, що перевищує норму, фіксувався достовірно рідше (27,25 % проти 54,55 %, $p \leq 0,05$), а показник депресії на субклінічному рівні діагностувався достовірно частіше, ніж у Групі 1 (54,50 % проти 18,20 %, $p \leq 0,05$), а на клінічному рівні – у 18,2 % пацієнтів. Після проходження опромінення у 81,81 % пацієнтів Групи 1 зафіксовано зростання показника дистресу та рівня тривоги, показники депресивної симптоматики мали тенденцію до погіршення. Показник рівня дистресу у Групі 2 після роботи з психологом на етапі підготовки до ПТ та проходження процедур опромінення зменшився майже вдвічі, рівень тривоги знизився до норми, показники депресивної симптоматики залишилися без змін. За оцінками показників ЯЖ за шкалами фізичного та рольового функціонування (PF та RP), загального стану здоров'я (GH) та психологічного здоров'я (MH) у пацієнтів обох груп до проходження ПТ відзначався достовірно нижчий рівень балів, ніж у Групи порівняння. Після проходження процедур встановлено достовірне погіршення показника за шкалою RP у Групі 1 (18,75 проти 40,00; $p \leq 0,05$) та покращення майже в 2 рази у Групі 2 (35,73 проти 68,33; $p \leq 0,06$). Показник загального стану здоров'я (GH) наприкінці ПТ у Групі 1 майже не змінився, а у Групі 2 мав тенденцію до покращення (20,93 проти 47,26; $p \leq 0,06$). Показник рівня життєвої активності (VT) у Групі 1 мав тенденцію до зниження надалі після отримання лікування, а у Групі 2 підвищився у 1,7 раза.

Висновки. Встановлено, що онкохворі перед початком ПТ відчували досить сильний дистрес і рівень тривоги. Психологічна корекція емоційного стану на початку лікування вплинула на достовірне покращення показників

✉ Кирилова Олена Олександрівна, e-mail: Kirillovalena0908@gmail.com

ЯЖ пацієнтів за шкалами рольового фізичного функціонування (RP) та життєвої активності (VT). Важливим напрямом роботи клінічного психолога на цьому етапі лікування виступили корекція когнітивної сфери, підтримка рольового функціонування та формування поведінки, націленої на подальше лікування.

Ключові слова: онкологія, променева терапія, якість життя, психологічний стрес, дистрес, хворі на колоректальний рак, хворі на рак голови та шиї.

Проблеми радіаційної медицини та радіобіології. 2022. Вип. 27. С. 353–362. doi: 10.33145/2304-8336-2022-27-353-362

M. V. Krasnoselskyi, O. O. Kyrylova✉, **T. V. Rublova, A. V. Svyrenko, S. V. Artiukh**

SE «Grigoriev Institute for Medical Radiology and Oncology of the National Academy of Medical Sciences of Ukraine», 82 Pushkinska St., Kharkiv 61024, Ukraine

ASSESSMENT OF DISTRESS DYNAMICS AND QUALITY OF LIFE OF CANCER PATIENTS AT THE STAGE OF RADIATION THERAPY AND POSSIBILITIES OF THEIR CORRECTION

Radiation therapy (RT) is the main type of antitumor treatment in inoperable patients. Low awareness and fear of the development of radiation reactions contributes to the destabilization of psycho-emotional state of patients, which can result in withdrawal from treatment and deterioration of their quality of life (QOL). Despite a steady increase in cancer rates in Ukraine, there are currently no studies to develop measures to improve psychological condition of patients undergoing treatment in radiation therapy departments.

Objective: to assess the dynamics of psycho-emotional status and QOL of cancer patients at the stage of radiation therapy.

Materials and methods. The study involved psychodiagnostic examination of 66 cancer patients who underwent radiation treatment in the clinic of the State Organization «Grigoriev Institute for Medical Radiology and Oncology of the NAMS of Ukraine», of whom Group 1 included 44 patients with head and neck cancer, Group 2 comprised 22 patients with colorectal cancer. Comparison group comprised 30 conditionally «healthy» respondents without cancer. All patients had stage III–IV cancer. The study implied the employment of «Distress Thermometer», Hospital Anxiety and Depression Scale (HADS), and the SF-36 Questionnaire (Short Form). The examination was performed before and following the course of radiation therapy. Group 1 patients underwent only psychodiagnostic examination, Group 2 patients apart from psychodiagnostic were accompanied by a psychologist before undergoing radiation procedures. In the comparison group, the survey was conducted once.

Results and discussion. Assessment of the data showed that before the start of RT most subjects (72.73 % in Group 1 and 77.3 % in Group 2) had a high level of distress, they were worried and nervous before the first radiation procedure, had fears about the consequences and side effects. The level of anxiety in Group 1 at the pathological and subclinical level was recorded in 54.55 % of patients, the rate of depression at the subclinical level was diagnosed in 18.20 %, and in 9.10 % of patients at the clinical one. In Group 2, the level of anxiety that exceeded the norm was recorded significantly less often (27.25 % vs. 54.55 %, $p_t \leq 0.05$), and the rate of depression at the subclinical level was diagnosed significantly more often than in Group 1 (54.50 % vs. 18.20 %, $p_t \leq 0.05$), and in 18.2 % of patients at the clinical level. After radiation, 81.81 % of Group 1 patients showed an increase in distress and anxiety, and depressive symptoms tended to worsen. The level of distress in Group 2 after consulting a psychologist in preparation for RT and undergoing radiation procedures decreased almost twice, the level of anxiety decreased to normal, the indicators of depressive symptoms remained unchanged. According to QOL assessments on the scales of physical and role functioning (PF and RP), general health (GH) and mental health (MH), patients in both groups had significantly lower scores before the RT than in the comparison groups. After the procedures, there was a significant deterioration in the RP scale in Group 1 (18.75 vs. 40.00, $p_t \leq 0.05$), and an improvement of almost 2 times in Group 2 (35.73 vs. 68.33, $p_t \leq 0.06$). The indicator of general health (GH) at the end of RT in Group 1 did not change, and in Group 2 it tended to improve (20.93 vs. 47.26, $p_t \leq 0.06$). Life expectancy (LE) in Group 1 tended to decrease further after treatment, having increased 1.7 times in Group 2.

✉ Olena O. Kyrylova, e-mail: Kirillovalena0908@gmail.com

Conclusions. The study showed that cancer patients before the onset of RT experienced a rather strong distress and level of anxiety. Psychological correction of the emotional state at the beginning of treatment allowed for a significant improvement in the QOL of patients on the scales of role physical functioning (RF) and vitality (VT). An important area of work of a clinical psychologist at this stage of treatment involved correction of cognitive sphere, support of role functioning and formation of behavior aimed at further treatment.

Key words: oncology, radiation therapy, quality of life, psychological stress, distress, patients with colorectal cancer, patients with head and neck cancer.

Problems of Radiation Medicine and Radiobiology. 2022;27:353-362. doi: 10.33145/2304-8336-2022-27-353-362

INTRODUCTION

There is a steady increase in the incidence of cancer worldwide. In Ukraine, more than 160,000 new cases of cancer are registered annually. According to the National Cancer Registry, in 2019 the total incidence of malignant neoplasms reached 384.7 cases per 100 thousand of population. As of the end of 2020, the National Cancer Registry contains information on more than 4 million cancer patients [1]. According to current data, radiation therapy (RT) is required by about 60 % of cancer patients at different stages of antitumor treatment: both as a single method and in combination and multi-modality therapy [2]. In most inoperable patients, RT is the main treatment. Modern technologies with radiation beam intensity modulation and visual control of the patient's position accuracy allow to influence malignant tumors with high accuracy, but it is not possible to completely avoid radiation reactions that may be accompanied by edema, pain, eating disorders, esthetic defects. It is the fear of these consequences that causes destabilization of the emotional state in patients, which can provoke withdrawal from therapy [3,4].

Not only the diagnosis of cancer carries emotional stress for the patient from the threat of disability and death, but also the process of anticancer treatment traumatizes the psyche of patients and is a cause of distress of varying severity. According to the founder of the Board for the correction of distress of the National Cancer Network, distress is a multifactorial, unpleasant, emotional experience in the psychosocial, social and/or spiritual spheres, which prevents coping with the disease, its symptoms and treatment [5]. Distress is a factor that reduces the quality of life (QOL) of cancer patients, which necessitates its timely diagnosis and correction [6, 7]. According to foreign studies, arrangement of psychological support, the use of a wide range of psychological and psychotherapeutic methods of care for cancer patients at the stage of radiation treatment can significantly improve their psycho-emotional state [8].

Quality of life is an integral characteristic of the sphere of human functioning, in the medical sense it is related to health and is based on the subjective perception of the patient. It is one of the key concepts of modern medicine, which helps to analyze the components of human life in accordance with WHO criteria. The study of QOL in patients with cancer is one of the important aspects of treatment, which directly affects the level of their psycho-emotional state. Maintenance of QOL patients is the second most important task of anticancer treatment after overall survival. According to modern international standards of cancer care, distress is one of the 6 main physiological indicators determined in cancer patients on admission to the hospital, along with heart rate, body temperature, blood pressure, respiratory rate and pain [9–11].

The effect of emotional stress on deterioration of the patient's physical condition due to the activation of negative emotional states, such as anxiety or depression, which affect physiological processes in the body and behavioral patterns, the disease process and treatment, has been repeatedly demonstrated [12].

However, at present, research in Ukraine on the factors of distress and QOL at the stage of radiation therapy is extremely insufficient, which makes it difficult to develop measures to improve the psychological state of patients undergoing treatment in radiation therapy departments. Meanwhile, the nature of coping with distress at this stage of treatment may determine patients' pessimistic or constructive attitudes and influence their motivation to continue fighting the disease and improve their quality of life.

OBJECTIVE

The purpose of the study: to assess the dynamics of psycho-emotional status and QOL of cancer patients at the stage of radiation treatment.

MATERIALS AND METHODS

The study involved psychodiagnostic examination of 66 cancer patients who underwent radiation treatment

in the clinic of the State Organization «Grigoriev Institute for Medical Radiology and Oncology of the NAMS of Ukraine». Group 1 consisted of 44 patients with head and neck cancer (12 women and 32 men), aged 40 to 64 years. Group 2 included 22 patients with colorectal cancer (8 women and 14 men), aged 50 to 85 years. The comparison group consisted of 30 conditionally «healthy» respondents who didn't have cancer and noted the absence of severe somatic pathology (10 women and 20 men) aged 40 to 74 years. The respondents were comparable with patients in socio-demographic characteristics. They were acquainted with the experimental procedure and signed the informed consent form.

All patients with head and neck cancer had stage III–IV disease with contraindications to surgery or without a technical possibility to perform radical surgery due to the spread of the tumor. These patients received radiation therapy according to the radical program by classical fractionation in a total focal dose of 70 Gy.

Patients with colorectal cancer also had stage III–IV disease, and underwent colonostomy in the early stages of treatment due to the risk of intestinal obstruction. In all cases, the tumor was considered unresectable and was not removed. Psychodiagnostic examination of these patients was performed 4 weeks after colonostomy in preparation for radiation therapy. RT was performed as part of a palliative program up to a total focal dose of 50 Gy.

The level of stress was assessed by «Distress Thermometer» test developed by J. Holland, which is a screening tool used to evaluate emotional discomfort and identify the main areas that contribute to personality distress [13]. The technique consists of two parts, namely: the first is a distress thermometer, on which patients are asked to mark the severity of distress they feel on a scale from 0 to 10, where 0 is the absence of distress, and 10 is extremely severe distress. The second part is a list of 39 questions related to the social, mental, spiritual and physical condition of the patient, which allow to identify the causes of distress. It is important to note that stress itself can have both negative and destructive effects on the body – distress, and mobilizing and activating action – eustress. Due to the fact that this study aims to study the negative effects of stress, we will use the concept of distress.

The Hospital Anxiety and Depression Scale (HADS) was developed by A.S. Zigmond and R.P. Snaith in 1983 to identify and assess the severity of anxiety and depression in general medical practice and was adapt-

ed by M.Yu. Drobizhev in 1993 [14]. The scale consists of 14 statements, divided into 2 subscales: «Anxiety» and «Depression». Items of the subscale «Anxiety» are compiled in accordance with the principles of standardized clinical interview (Present state examination) and personal clinical experience of the authors and reflect mainly psychological manifestations of anxiety. Items of the sub-scale «Depression» are selected from the list of the most common complaints and symptoms and reflect mainly the anhedonic component of depressive disorder. Each of the 14 statements corresponds to 4 answer options that reflect the gradation of the severity of the symptom and is coded by increasing the severity of the symptom from 0 (absence) to 3 (maximum severity) points. When interpreting the results, the total indicator for each scale is taken into account, with 3 areas of its values: 0–7 as norm (absence of significantly expressed symptoms of anxiety and depression), 8–10 as subclinically expressed anxiety or depression, ≥ 11 as clinically expressed anxiety and depression.

Quality of life indicators were studied using the SF-36 (Short Form) questionnaire [15]. The SF-36 questionnaire contains 36 questions covering 8 categories of QOL.

The following categories were quantified:

- 1) Physical Functioning (PF), which reflects the degree of limitation of physical condition to perform physical activity;
- 2) Role Physical Functioning (RP), the influence of physical condition on daily human activities;
- 3) Bodily pain (BP) and its effect on the ability to engage in daily activities;
- 4) General health (GH), assessment of patients' current health, as well as prospects for treatment;
- 5) Vitality or vital activity (VT), feeling full of strength and energy or, conversely, exhausted;
- 6) Social functioning (SF) is determined by the degree of restriction of physical or emotional state of social activity;
- 7) Role-emotional functioning (RE) involves assessing the degree of influence of emotional state on the performance of work;
- 8) Mental health (MH) characterizes mood, the presence of depressive symptoms and anxiety.

Psychodiagnostic examination of patients was performed in preparation for RT and after receiving a course of radiation. Patients completed the questionnaires independently, after which the scores were calculated with subsequent assessment of the dynamics of their condition. In the comparison group, the survey

was conducted once. Moreover, Group 2 (patients with CRC) before undergoing radiation procedures in addition to psychodiagnosis were accompanied by a psychologist. Group 1 (patients with head and neck cancer) underwent only psychodiagnosis.

Statistical processing of the study results was performed using Statistica 10.0 software (StarSoft Inc, USA). ϕ -Fisher's angular transformation criterion was used in the nonparametric distribution of indicators to assess the reliability of their difference. Student's-Fisher t -test was employed to assess the significance of differences between groups of respondents when comparing the means, which is used for small samples when there is no confirmation of the normal distribution of indicators [16].

RESULTS AND DISCUSSION

Evaluation of the data obtained by the method of «Distress Thermometer» showed the difference between groups of patients. Before the onset of RA, most subjects (72.73 % in Group 1 and 77.3 % in Group 2) had a high level of distress. The group mean in Group 1 was 4.50 ± 2.13 points and 4.25 ± 2.06 points in Group 2 (on a 10-point scale, where 1 is the minimum level of distress, 10 is the maximum level, which results in maladaptation of the patient). But in Group 1 for men this figure was slightly higher than for women (5 points vs. 3.60, respectively), and in Group 2, on the contrary, for women this figure was 2 times higher than for men (6.01 points) versus 3.23, respectively).

According to the results of the questionnaire before the RT, 72.73 % of Group 1 patients noted the presence of emotional problems, namely: 63.64 % noted the presence of strong worry and nervousness before the first radiation procedure, 45.45 % noted the fear of the pain of radiation procedure, the same number noted the presence of a pessimistic perception of this type of treatment, expectations of consequences and strong side effects, which prevented them from deciding to receive further treatment. 63.64 % of patients noted physical problems that contributed to the deterioration of their emotional state: 36.36 % of patients complained of discomfort when eating, nausea, 27.27 % of patient had dry skin, 18.18 % of patients complained of numbness of the hands.

All 100 % of Group 2 patients were worried and nervous before the radiation procedure, 42.86 % had fears about the consequences and side effects of RT, pessimistic attitude to treatment was observed in 57.14 % of subjects. Group 2 patients associated the presence of distress with financial problems (50 %), making difficult

decisions about radiation treatment (25 %), and feelings about the health of family members (25 %). Cognitive distortions relative to RT were found in 100 % of patients. The emotional state was aggravated by the perception of the pain due to RT procedures and expectation of unavoidable unpleasant consequences and side effects in the form of nausea, vomiting, hair loss, etc.

Indicators of the emotional state of cancer patients before and after radiation therapy are shown in Fig. 1. According to the obtained data, the level of anxiety and depression in Group 1 was on average subclinical ($Tr = 9.4 \pm 3.1$ and $D = 9.02 \pm 2.5$). At the pathological and subclinical level, the anxiety rate was recorded in 54.55 % of patients. The rate of depression at the subclinical level was diagnosed in 18.20 % of subjects, at the clinical level in 9.10 % of patients. On average in Group 2, the level of anxiety and depression also corresponded to subclinical ($Tr = 8.38 \pm 3.71$ and $D = 8.02 \pm 3.75$). However, the level of anxiety that exceeded the norm was recorded in only a third of patients (27.25 % vs. 54.55 %, $p_t \leq 0.05$), and the rate of depression at the subclinical level was diagnosed significantly more often than in Group 1 (54.50 % vs. 18.20 %, $p_t \leq 0.05$), and at the clinical level in 18.2 % of patients.

After consulting a psychologist at the stage of preparation for RT and undergoing radiation procedures, the level of distress in Group 2 decreased almost twice and amounted to 2.26 ± 1.08 . 50 % of patients indicated that they felt better emotionally than expected. The level of anxiety in general in Group 2 decreased to normal ($Tr = 6.51 \pm 3.50$), and indicators of depressive symptoms remained unchanged at the subclinical level ($D = 9.67 \pm 3.52$).

During the course of RT procedures in 81.81 % of patients in Group 1, the distress rate increased by 1–2 points and the average rate in the group was already equal to 6.3 ± 2.21 . The level of anxiety in the group as a whole increased and was already recorded in 81.8 % versus 54.5 % before therapy, the indicators of depressive symptoms tended to worsen, and were recorded in 72.7 % of patients against 27.25 % before therapy.

If we consider patients with colorectal cancer, then by the stage of radiation therapy their psycho-emotional state was already quite disturbed, because they underwent surgical treatment for the formation of intestinal stoma. Many studies indicate that stoma surgery in patients is a severe stressful event for the patient and is accompanied by a high level of mental distress [17–20]. The formation of the stoma is reflected at all levels of the patient's functioning – physical, mental,

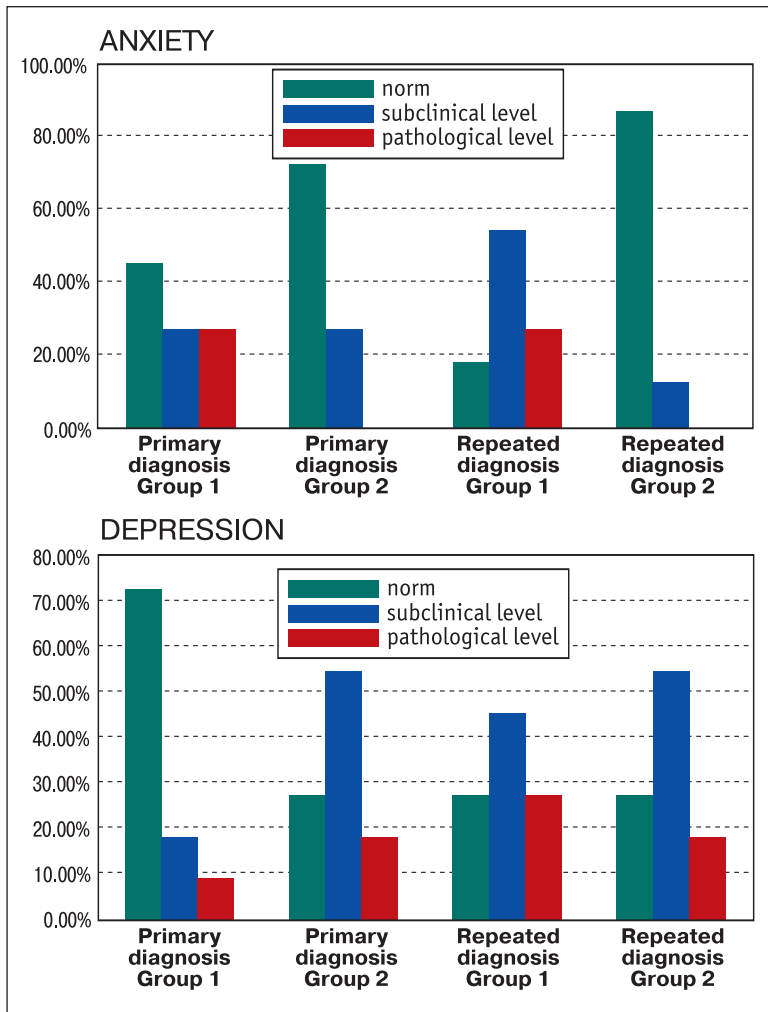


Figure 1. Dynamics of indicators of the emotional state of cancer patients at the stage of radiation treatment

social. Limitations and influences caused by the presence of stoma are expressed in physical discomfort, intense psycho-emotional experiences, disruption of interpersonal relationships and social adaptation. Changing the «body image» in connection with fatigue, is often perceived as unsightliness, resulting in feelings of physical and psychological inferiority, formation of low self-esteem, a high degree of dissatisfaction with life in general [21–23]. However, with psychological support at the beginning of radiation therapy, at the end of treatment this group of patients showed lower levels of distress and anxiety reduction than the group of patients with head and neck cancer who did not undergo surgery and were not accompanied by a psychologist at the stage of RT.

According to the data obtained by the SF-36 test in the comparison group, the values of indicators within each of the scales tended to 100 points, indicating the absence of physical or mental barriers for respondents to work, their active communication with other people, exercise, social activity, about satisfaction in various spheres and harmony of their physical, psychological, emotional and social functioning (Table 1).

According to the scale of physical functioning (PF) in patients of both groups at the stage of preparation for RT there was a significantly lower level of scores than in the comparison groups (66.36 and 51.23 vs. 94.7, $p_t \leq 0.05$). Patients confirmed that there were difficulties in performing actions requiring physical effort. To the question «Does your current health limit you in performing the following physical activities?» the majority of Group 2 respondents noted difficulties in climbing stairs (one or more flights), inclines and squats, walking, etc. After undergoing RT procedures at the end of treatment, there was a tendency to improve this indicator on this scale (66.36 vs. 71.25 in Group 1 and 51.23 vs. 78.57 in Group 2), but not to the level of the comparison group, which confirms lack of impact of radiation therapy on the possibility of physical functioning of the patient.

Before treatment, the indicator on the RP scale was less than that in healthy individuals, 2.4 times ($p_t \leq 0.05$) in Group 1 and 2.6 times ($p_t \leq 0.05$) in Group 2, indicating a limitation of the opportunities for role functioning in patients. They pointed to the compulsion to reduce the time spent on any work due to physical

Table 1
Indicators of QOL of patients according to the SF-36 test (points)

SF-36 scale	Group 1 before RT n = 44	Group 1 after RT n = 44	Group 2 before RT n = 22	Group 2 after RT n = 22	Comparison group n = 30
Physical functioning, PF	66.36 ± 2.51 ¹	71.25 ± 2.56	51.23 ± 3.42 ¹	78.57 ± 1.97	94.71 ± 1.49
Role physical functioning, RP	40.00 ± 2.34 ¹	18.75 ± 1.98 ³	35.73 ± 5.34 ¹	68.33 ± 2.36	94.12 ± 2.51
Bodily pain, BP	58.7 ± 3.57 ¹	67.75 ± 2.57	83.75 ± 2.06	80.28 ± 3.02	96.94 ± 1.98
General health, GH	58.00 ± 2.81 ¹	55.00 ± 2.63	20.93 ± 1.96 ²	47.26 ± 2.41	92.12 ± 2.58
Vitality or vital activity, VT	60.50 ± 1.92	55.00 ± 2.36	38.54 ± 1.41	68.56 ± 1.92	87.65 ± 2.78
Social functioning, SF	66.25 ± 1.59	62.5 ± 3.21	50.85 ± 6.13	62.85 ± 1.74	91.12 ± 1.97
Role-emotional functioning, RE	50.00 ± 2.64	46.67 ± 3.20	41.25 ± 3.10	59.75 ± 2.85	88.24 ± 3.77
Mental health, MH	45.63 ± 2.03 ¹	46.00 ± 3.06	54.00 ± 3.54 ¹	56.98 ± 2.61	95.59 ± 2.40

Notes. ¹ $p_t \leq 0.05$ the presence of a statistically significant difference between the study groups and the comparison group; ² $p_t \leq 0.01$ the presence of a statistically significant difference between the study groups and the comparison group; ³ $p_t \leq 0.05$ the presence of a statistically significant difference between the indicators prior and following RT

problems, to reduce its volume, to make additional efforts, while virtually healthy individuals in the comparison group did not indicate such difficulties. During treatment, the rate on this scale in Group 1 significantly deteriorated and was 2 times lower than before RT (18.75 vs. 40.00 $p_t \leq 0.05$) and 5 times lower than in the comparison group (18.75 vs. 94.12, $p_t \leq 0.01$). In Group 2, on the contrary, the indicator on this scale was 1.9 times (35.73 vs. 68.33, $p_t \leq 0.06$), which may indicate the effectiveness of consulting a psychologist, aimed at maintaining role functioning, and considering it as a resource in the fight against the disease.

Prior to radiotherapy, the intensity of physical pain (BP scale) in patients with head and neck cancer was 1.5 times lower than in the comparison group. Group 2 patients did not experience severe and intense pain at either the beginning or end of treatment. According to these responses of patients in Group 1, the decrease was mainly due to the presence of pain of «moderate» or «mild» degree (according to SF-36 questionnaire). However, it was these feelings that made it difficult to perform work, which was an additional factor in reducing the RP in these patients.

Indicators of general health (GH scale) in the subjects at the stage of preparation for RT were significantly lower than those in healthy respondents (58 vs. 92.12, $p_t \leq 0.05$ in Group 1 and 20.93 vs. 92.14, $p_t \leq 0.01$ in Group 2). The low GH values were due to the patients' belief that their health was worse than most other people's, and all patients were confident that their health would deteriorate further after the course of RT. At the end of radiation treatment, the indicator on this scale in Group 1 did not change (58 vs. 55), and in the group of patients consulting a psychologist, it tended to improve (20.93 vs. 47.26, $p_t \leq 0.06$).

The level of vital activity (VT scale) in patients of both groups before the beginning of RT was slightly reduced relative to control values. In Group 1, this indicator tended to decrease further after treatment. In Group 2, on the contrary, it increased 1.7 times. At the beginning of radiation therapy, patients noted feelings of depression, fatigue, indicated nervousness, frustration, the obvious connection of these experiences with obtaining incorrect information about the consequences of RT and the need to make decisions whether to undergo it or not. After consulting a psychologist and the first exposure procedure, more than half of the respondents from Group 2 noted a decrease and inconsistency of these ideas, and better health than they expected before starting treatment.

The indicator characterizing the ability to social functioning (SF scale) in patients at the beginning of RT in both groups was lower compared to the control group. When answering the question «How often in the last 4 weeks has your physical or emotional state prevented you from actively communicating with people (visiting friends, relatives?)», patients chose the answer «Most of the time».

Also, the studied patients had difficulties in role functioning due to emotional state (RE scale). They pointed out that due to emotional turmoil, they could not do their work on time or did it to a lesser extent and not as well as before.

Our results have an element of novelty, because the quality of life of patients with colorectal cancer in modern studies was evaluated at the stage before and after surgery [24], in patients with head and neck cancer QOL was evaluated by stages and age of patients [25] or in remote period (after 5 years of receiving radiation treatment) [26]. We did not find any data on the assessment of quality of life indica-

tors at the stage of radiotherapy before and after receiving radiation.

Thus, we see that after undergoing radiation therapy there is a tendency to deteriorate levels of vital activity, social and role functioning due to emotional state (VT, SF and RE scales). Patients more often felt tired and depressed, had less contact with people. According to recent responses from patients with head and neck cancer, they have never, or very rarely, felt happy, calm, peaceful. The MH score (mental health status) in Group 1 was 2-fold lower than in the control groups (45.63 vs. 95.59, $p_t \leq 0.05$). Patients in both groups did not show an improvement in mental health after RT.

CONCLUSIONS

The study showed that before radiation therapy, regardless of the abnormality, patients experienced a rather strong distress and level of anxiety. Most of them noted the presence of emotional and physical problems. The main causes of their emotional discomfort included absolute insecurity, problems with access to medical care; problems in financial matters (complete lack of social support from the state). The level of anxiety increased due to the presence of fears associated with the process of radiation regarding the pain of the procedure, patients noted severe anxiety and nervousness before the first radiation procedure, indicated sadness and loss of interest in normal activities, noted pessimistic perception of treatment, expected consequences and severe side effects, which prevented the decision to receive further treatment. All this reduced the level of quality of life in general, patients noted various complications of a physical and mental nature, which were associated with the presence of physical pain and limitation of physical and social activities. Patients with colorectal cancer at the beginning of radiotherapy were more emotionally destabilized due to the operation to remove the stoma, but with the support of a psychologist, at the end of RT showed a significant reduction in distress and anxiety than in the group of patients with head and neck cancer, who did not receive the help of a psychologist at the stage of RT. Psychological correction of the emotional state at the beginning of radiotherapy helped to significantly

improve the quality of life of patients with colorectal cancer after therapy on the scales of role physical function (RP) and vitality (VT).

Final reliable conclusions regarding the effectiveness of psychological support for cancer patients at the stage of radiation therapy can be made under the conditions of increasing the number of examined patients and conducting an analysis of the comparison of groups by gender and age characteristics, localization of the tumor and dose load during RT, which we plan to take into account in further studies.

Thus, the obtained results indicate that when preparing cancer patients for the course of RT for patients it is very important to consult a psychologist, aimed at reducing anxiety and normalizing the emotional state of patients, preventing the development of phobic symptoms. An important area of work of a clinical psychologist at this stage will be the correction of cognitive sphere (psychoeducation regarding the debunking of myths about RT) and the formation of behavior aimed at treatment. The course of RT accompanied by psychological support should be aimed at reducing distress and maintaining motivation for treatment. The proposed approach needs further development, improvement and comparison with relevant international protocols.

Conflict of interest

The authors state no conflict of interest or own financial interest in the article preparing.

Connection of the study with scientific programs, plans and topics

The study was performed within the scientific research activity «To optimize topometric preparation for radiation therapy of patients with head and neck cancer» State Registration No. 0119U103013, NAMS topic code 01.20 and scientific research activity «Development of an algorithm for psychological support of patients with colorectal cancer at different stages of treatment». State registration No. 0120U103299, NAMS topic code 04.21.

Funding information

The work is financed by the State Budget of Ukraine.

REFERENCES

1. Fedorenko ZP, Gulak LO, Mikhailovich YY et al. [Cancer in Ukraine. 2018-2019: Morbidity, mortality, indicators of the oncology service]. *National Cancer Registry of Ukraine*. 2019;20:101. URL: <http://www.ncru.inf.ua/>. Ukrainian.
2. Nidal S. [Radiation therapy can preserve not only the organ, but also its functions. Interview 20.07.2018]. URL: <https://mosgorzdrav.ru/ru-RU/material/default/transcript/56.html>. Russian.

3. Ivankova VS. [Modern radiation therapy and stages of its development]. *Ukrainian Journal of Radiology*. 2015;23(2):87. URL: http://nbuv.gov.ua/UJRN/URLZh_2015_23_2_23. Ukrainian.
4. Kyrylova OO, Kulinich GV, Prokhach NE. [Medical and psychological support of cancer patients at the stage of radiation therapy]. In: *Introduction of modern achievements of medical science in the practice of health care in Ukraine: materials of the IX International Medical Congress*. Kiev; 2020. 10 p. Ukrainian.
5. Holland JC, Alici Y. Management of distress in cancer patients. *The journal of supportive oncology*. 2010;8(1):4-12.
6. Oleinikova IN, Gens GP, Sirota NA, Shikina VE, Sadikova OE. [Quality of life and distress in patients with ovarian cancer]. *Palliative medicine and rehabilitation*. 2017;2:25-7. Russian.
7. Ploos van Amstel FK, van Ham MA, Peters EJ, Prins JB, Ottevanger PB. Self-reported distress in patients with ovarian cancer: is it related to disease status? *International journal of gynecological cancer*. 2015;25(2):229-235. doi: 10.1097/IGC.0000000000000355.
8. Kirilova OO, Starenky VP, Artyukh SV, Prokhach NE, Kiyana TG. [The role of a clinical psychologist in the system of medical and psychological support of cancer patients at the stage of radiation therapy]. *Ukrainian Radiological and Oncological Journal*. 2020;28(3):255-272. doi: 10.46879/ukroj.3.2020.255-272. Ukrainian.
9. Holland J, Watson M, Dunn J. The IPOS new International Standard of Quality Cancer Care: integrating the psychosocial domain into routine care. *Psychooncology*. 2011;20(7):677-680. doi: 10.1002/pon.1978.
10. Pirl WF, Fann JR, Greer JA, Braun I, Deshields T et al. Recommendations for the implementation of distress screening programs in cancer centers: Report from the American Psychosocial Oncology Society (APOS), Association of Oncology Social Work (AOSW), and Oncology Nursing Society (ONS) joint task force. *Cancer*. 2014;120(19):2946-2954. doi: 10.1002/cncr.28750.
11. Calderon C, Carmona-Bayonas A, Jara C et al. Emotional functioning to screen for psychological distress in breast and colorectal cancer patients prior to adjuvant treatment initiation. *European Journal of Cancer Care*. 2019;28(3):3005. doi: 10.1111/ecc.13005.
12. Cohen S, Gianaros P, Manuck SB. A stage model of stress and disease. *Perspectives on Psychological Science*. 2016;11(4):456-463. doi: /10.1177/1745691616646305.
13. Ownby KK. Use of the distress thermometer in clinical practice. *Journal of the Advanced Practitioner in Oncology*. 2019;10(2):175-179.
14. Zigmond AS. The Hospital Anxiety and depression scale. *Acta psychiatrica Scandinavica*. 1983;67(6):361-370. doi: 10.1111/j.1600-0447.1983.tb09716.x.
15. Bunevicius A. [Reliability and validity of the SF-36 questionnaire for examining the health of patients with brain tumors: a cross-sectional study]. *Health Qual. Life Outcomes*. 2017;15:92. doi: 10.1186/s12955-017-0665-1. Russian.
16. Sidorenko EV. [Methods of mathematical processing in psychology Speech]. 2007. 349 p. Russian.
17. Beaubrun En Famille Diant L, Sordes F, Chaubard T. Impact psychologique de la stomie sur la qualite de vie des patients atteints d'un cancer colorectal : role de l'image du corps, l'estime de soi et l'anxiete [Psychological impact of ostomy on the quality of life of colorectal cancer patients: Role of body image, self-esteem and anxiety]. *Bull Cancer*. 2018;105(6):573-580. French. doi: 10.1016/j.bulcan.2018.03.005.
18. Sun GW, Yang YL, Yang XB et al. Preoperative insomnia and its association with psychological factors, pain and anxiety in Chinese colorectal cancer patients. *Supportive Care in Cancer*. 2020;28:2911-2919. doi: 10.1007/s00520-019-05151-y
19. Russell L, Gough K, Drosowsky A, Schofield P, Aranda S, Butow PN, et al. Psychological distress, quality of life, symptoms and unmet needs of colorectal cancer survivors near the end of treatment. *J Cancer Surviv*. 2015;9(3):462-70. doi: 10.1007/s11764-014-0422-y.
20. Calderon C, Jimenez-Fonseca P, Jara C et al. Comparison of coping, psychological distress, and level of functioning in patients with gastric and colorectal cancer before adjuvant chemotherapy. *Journal of Pain and Symptom Management*. 2018;56(3):399-405. doi: 10.1016/j.jpainsymman.2018.05.010.
21. Miles AL, McClements P, Steele R et al. Perceived diagnostic delay and cancer-related distress: a cross-sectional study of patients with colorectal cancer. *Psychooncology*. 2017;26(1):29-36. doi: 10.1002/pon.4093.
22. Miniotti M, Bassino S, Fanchini L et al. Supportive care needs, quality of life and psychological morbidity of advanced colorectal cancer patients. *European Journal of Oncology Nursing*. 2019;43:101-668. doi: 10.1016/j.ejon.2019.09.009.
23. Aminisani N, Nikbakht H, Jafarabadi M et al. Depression, anxiety, and health related quality of life among colorectal cancer survivors. *Journal of Gastrointestinal Oncology*. 2017;8(1):81-88. doi: 10.21037/jgo.2017.01.12.
24. Medvednikov AA, Shelekhov AV, Dvornichenko W et al. [Quality of life of patients with rectal cancer after surgical treatment]. *Pelvic Surgery and Oncology*. 2019;9(4):37-42. Russian.
25. Silveira AP, Goncalves J, Sequeira T et al. Geriatric oncology: comparing health related quality of life in head and neck cancer patients. *Head & Neck Oncology*. 2011;3:3. doi: 10.1186/1758-3284-3-3.
26. Braam PM, Roesink JM, Raaijmakers CP et al. Quality of life and salivary output in patients with head-and-neck cancer five years after radiotherapy. *Radiation Oncology*. 2007;2:3. doi: 10.1186/1748-717X-2-3.

INFORMATION ABOUT AUTHORS

Mykola V. Krasnoselskyi – Doctor of Medical Science, Professor, Director of SE «Grigoriev Institute for Medical Radiology and Oncology of the National Academy of Medical Sciences of Ukraine», Kharkiv, Ukraine, ORCID: 0000-0001-5329-5533

Olena O. Kyrylova – PhD in Psychology, Senior Researcher of Group of Oncological Psychology and Rehabilitation, SI «Grigoriev Institute for Medical Radiology and Oncology of the National Academy of Medical Sciences of Ukraine», Kharkiv, Ukraine, ORCID: 0000-0002-3508-0405 tel. +38(050)-59-89-026

Tatiana V. Rublova – PhD (Radiobiology), Deputy Director on Science SI «Grigoriev Institute for Medical Radiology and Oncology of the National Academy of Medical Sciences of Ukraine», Kharkiv, Ukraine, ORCID: 0000-0002-8007-3220

Andriy V. Svyharenc – Doctor of Medical Science, Department of Radiology SI «Grigoriev Institute for Medical Radiology and Oncology of the National Academy of Medical Sciences of Ukraine», Kharkiv, Ukraine, ORCID ID: 0000-0001-8854-8561

Artiukh Serhii Volodymyrovych – Candidate of Medical Sciences, Senior Researcher Radiology Deptment, SI «Grigoriev Institute for Medical Radiology and Oncology of the National Academy of Medical Sciences of Ukraine», Kharkiv, Ukraine, ORCID: 0000-0002-7189-3614

Стаття надійшла до редакції 27.07.2022

Received: 27.07.2022