NCCN Distress Thermometer as a Screening Tool for Detecting Psychoemotional Disorders in Patients with Malignant Tumors of the Female Reproductive System

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Treatment of patients with gynecological cancer is a serious challenge and causes severe trauma for patients, primarily if it is associated with surgical intervention. Even after cancer is successfully treated, psychological disorders stay and sometimes exacerbate, including those associated with an identity crisis.

The purpose of this study was to evaluate how informative the use of the NCCN distress thermometer is for detecting psychoemotional disorders in patients with malignant tumors of the female reproductive system after successful anticancer treatment.

Materials and methods. Forty-seven gynecological cancer patients were included in the study after surgical or combined (surgery + chemotherapy) treatment. They included 17 patients with cervical cancer, 18 with endometrial cancer, and 12 with ovarian cancer. Panhysterectomy was a component of surgical treatment in all patients. Eleven patients were examined shortly after the surgical treatment (after 12 to 14 days), and the remaining 36 patients were surveyed during the follow-up visit 6-12 months after the treatment. At the time of the visit, the absence of cancer progression signs was confirmed by X-ray imaging methods (CT, MRI) and clinically. All patients were asked to rate their level of distress over the past week using the NCCN Distress Thermometer questionnaire. Version 2.2022.

Results. Twenty-five patients (62%) had a level of distress above the threshold ≥ 4. Nine patients had a level of distress ≥ 7. The most frequent problems causing distress were excitement and anxiety (80%), fatigue (81.3%), sleep disturbances (58%), sadness/depression (36%), and fear (33%). Almost a third (27%) of female patients recognized relationship problems with their partner and the presence of sexual problems (22%). About 20% identified issues in understanding the meaning of life. Identified psychoemotional disorders did not depend on tumor localization.

Conclusions:

1) More than half of gynecological cancer patients were found to have psychoemotional disorders and a level of distress above the limit after the successful completion of cancer treatment.

2) NCCN DT is an effective screening tool used to identify psychoemotional disorders in patients after the successful treatment of gynecological cancer.

3) Testing may be performed not only immediately after the treatment but also in the long term (after 6 to 12 months) since psychoemotional manifestations of distress (identity crises) may exacerbate over time.

Keywords: NCCN distress thermometer, malignant tumors of the female reproductive system, psychoemotional disorders, quality of life.
Introduction

Malignant tumors are one of the most important causes of morbidity and mortality worldwide. The latest statistics for 2022 indicate 20 million new cancer cases and 9.7 million deaths[1]. In countries with a high level of income, despite the existence of screening programs, the incidence of hormone-dependent tumors – breast and endometrial cancer and prostate cancer – is increasing.[2] In low-income countries, the burden of cervical cancer is noticeable. Thus, it is the reproductive system that finds itself under carcinogenic pressure today. However, the last decade’s achievements in diagnosing and treating malignant tumors of the reproductive system provide reasonable grounds not to perceive the diagnosis of cancer as a sentence. If the disease is diagnosed in a timely manner, the probability of a complete cure can reach 85 to 90%. Combined treatment of neglected stages ensures a long relapse-free period, allowing to consider this disease as chronic. With such treatment results, physical, psychological, and social aspects of life quality come to the foreground.

Although the position of a psychologist is present in many cancer treatment facilities in Ukraine, psychologists are either lacking or there are very few of them[3]. Domestic healthcare facilities are not very enthusiastic to cooperate with psychologists, although it is already a routine practice abroad.[4] The situation has been improving in recent years.[3] Awareness of cancer diagnosis is a significant stress and a distinct psychological trauma. Therefore, a psychologist is often contacted at the time of diagnosis, its notification and acceptance before starting treatment, especially surgical. Cancer in such situations is perceived as an existential threat that virtually destroys the usual way of patients’ lives. However, after the decision on treatment is made and the treatment starts, psychological support recedes into the background, as the patients’ efforts are concentrated on overcoming trials related to treatment. Factors of somatic disease are decisive. After all, cancer treatment is quite aggressive, it may be accompanied by partial or complete organ removal and disability, affects the physical quality of the patient’s life, and is psychologically exhausting [5–7]. The identity crisis problem may arise during treatment in this group of patients.

A person who felt healthy and tried to control the situation in all its manifestations, both in terms of social and family life, suddenly finds themselves in a hospital bed, experiencing helplessness. They cannot take care of themselves independently and lose faith in their social capacity and self-sufficiency. The patient loses the opportunity to plan their life and loses autonomy and freedom of choice, which implies possible social consequences of the disease, possible disability, and changes in the family situation. Even after the successful treatment, cancer patients may still experience psychological difficulties associated with distorted identity, which may even exacerbate.

The need to timely identify possible psychoemotional disorders in cancer patients at all stages of their treatment and observation is obvious. Self-referral of patients is rare, despite the creation of hotlines for psychological support of cancer patients. The reasons include lack of information and shame.[3] Therefore, searching for helpful measures among the general flow of patients to single out those who need psychological/psychiatric assistance the most and actively offering it is extremely relevant.

To determine the degree of distress and identify psychoemotional disorders in cancer patients, the NCCN distress thermometer (DT) questionnaire was suggested.[8] The DT has been translated into 26 languages. Eighteen translated versions have demonstrated adequate validity in validation studies.[9,10] The most commonly used tools for clinical validation of non-English versions NCCN DT were the Hospital Anxiety and Depression Scale by Zigmond and Snaith and Psychiatric diagnoses via a clinical interview. The most commonly identified cut-off score was “4” [9]. The validity of the Ukrainian version of NCCN DT has not been assessed.

The purpose of this study was to investigate the efficiency of the NCCN DT in assessing the degree of distress, identifying psychoemotional disorders and identity crisis in patients with malignant tumors of the reproductive system after cancer treatment, as well as determining the optimal term for conducting this examination.
**Materials and Methods**

Forty-seven patients with malignant tumors of the reproductive system, who were treated at the Lviv Oncological Regional Diagnostic and Treatment Center from 2022 to 2024, who completed surgical or combined cancer treatment and gave consent to using clinical data and survey results for research purposes, took part in the study. The average age of patients was 53 years old (from 38 to 70 years).

The 16 patients with cervical cancer (FIGO IB stages), 17 with endometrial cancer (FIGO I stage), and 13 with ovarian cancer (FIGO IIB-IIIC stages) were examined.

3 patients with endometrial cancer have got adjuvant radiation. All patients with ovarian cancer have got adjuvant chemotherapy. However, adjuvant treatment was completed more than 6 months before the survey. The part of the treatment of all patients was panhysterectomy. Thirty-six patients were examined 6 to 12 months after surgical or combined (surgery + chemotherapy) treatment during a follow-up visit to the gynecological oncologist. At the time of the visit, none of them showed any signs of cancer progression either during a gynecological examination or by imaging methods (CT, MRI). Moreover, 11 patients were examined 12–14 days after radical surgery, but they were in good condition, preparing for discharge, or had been discharged from the hospital. All of them underwent radical surgery. Analysis of prognostic factors indicated a low risk of disease recurrence and a favorable prognosis.

After the purpose of the study had been explained, all patients were asked to assess their level of distress during the last week using the NCCN DT, version 2.2022. Comfortable conditions were created for patients to answer the questionnaire, they were not limited in time.

**NCCN Distress Thermometer Survey, version 2.2022.**

To evaluate the level of distress and the presence of possible psychoemotional disorders, the Ukrainian version of the NCCN Distress Thermometer (DT) questionnaire, version 2.2022, was used. This one-item questionnaire uses a Likert scale from 0 (no problems) to 10 (extreme distress), which resembles a thermometer. It also includes a problem list updated by the NCCN working group (Problem list). Patients rated their level of distress over the past week. They also checked the list of concerns about any of the items: physical, emotional, social, spiritual/religious and practical from the proposed list. The cut-off score, which identified the need for further examination and indicates the presence of psychoemotional issues, was “4”.

Statistical processing of results

The normality of the distribution in the obtained groups was evaluated during statistical data processing. The nature of the distribution of the obtained variation series was checked using the Shapiro-Francia test, which confirmed the Gaussian data distribution. When statistically processing obtained data, the following calculations were made: the arithmetic mean and its standard deviation (M ± SD), relative value analysis, and the probability of difference between groups of patients using the Student’s and Chi-Square distribution methods.

**Results**

To rule out the direct impact of anticancer treatment (irradiation, chemotherapy) on the psychoemotional state of patients, a cohort of patients who completed treatment, had a favorable prognosis or objective confirmation of the absence of cancer progression (CT, MRI results) was selected for the study. The division into groups depending on the time of surgical intervention, which included panhysterectomy, allowed for assessing its immediate and distant consequences on the patients’ psychoemotional condition. The first group included 36 patients who completed cancer treatment more than 6 to 12 months before. The second group included 11 recently (12–14 days before) operated patients who were preparing for discharge or had already been discharged from the hospital. In this group, the level of distress was relatively low. Only two patients had a value above the limit – ≥4 on DT. The most frequent problems in the second subgroup were sleep disturbances (54%), anxiety (36%), change in attitude towards shrines (36%), fatigue (27%), fear and loneliness (27%), awareness of meaning or purpose (27 %) (Fig. 1–5). This distribution of complaints can probably be associated with an emphasis on physical problems shortly after surgical intervention and a rethinking of values after experiencing an existential threat. The mean indicator of the level of distress in this subgroup, determined by the NCCN DT, was 1.5 +–2.0
Figure 1. The frequency of physical concerns in patients with malignant tumors of the female reproductive system in the groups immediately after the treatment and during follow-up within a year (in %)

Figure 2. The frequency of emotional concerns in patients with malignant tumors of the female reproductive system in the groups immediately after the treatment and during follow-up within a year (in %)

Figure 3. The frequency of social concerns in patients with malignant tumors of the female reproductive system in the groups immediately after the treatment and during follow-up within a year (in %)
Figure 4. The frequency of practical concerns in patients with malignant tumors of the female reproductive system in the groups immediately after the treatment and during follow-up within a year (in %)

Figure 5. The frequency of problems related to spiritual and religious concerns in patients with malignant tumors of the female reproductive system in the groups immediately after the treatment and during follow-up within a year (in %)

At the same time, patients who completed treatment more than 6–12 months earlier and had objective evidence of the absence of disease progression noted a much wider range of problems. The level of distress was below the limit only in 13 patients. The remaining 23 patients (62%) defined their level of distress as four or more. Nine patients (25%) rated their level of distress at >7. The most frequent manifestations were anxiety and worry (81%), a feeling of chronic fatigue (50%), sleep disturbances (58%), sadness/depression (36%), loss of interest and the ability to enjoy pleasure (22%). In this group, relational problems were noted more often, in particular, problems in relations with a partner/husband (28%), concerns about sexual health (22%), and the ability to have children (16%). Identified psychoemotional disorders did not depend on tumor localization.

A statistically significant difference between both groups was found in the frequency of anxiety and worry (p<0.001), the ability to have children (p<0.05), communication with medical professionals (p<0.05), problems with the meaning of life (p<0.05), and attitude to shrines (p<0.05).

Thus, the NCCN DT proved to be an effective screening tool for identifying psychoemotional disorders and assessing the degree of distress in patients who had undergone successful treatment of reproductive system
cancer. At the same time, it turned out that testing should be carried out not only immediately after the treatment but also over the long term (after 6 to 12 months) because psychoemotional manifestations of distress (identity crisis) may exacerbate over time.

**Discussion**

Today, psychological support for cancer patients should be considered as a component of their complex treatment.[3] It appears evident at the time of notification/acceptance of the diagnosis, during long-term chemotherapy, and in palliative situations.[3,7] The need for such assistance for successfully treated patients with a favorable prognosis may cause doubt. However, the results obtained by us indicate the presence of distress and psychological problems in more than half of such patients. The main problems faced by patients are anxiety, loss of control over their bodies, relationship problems, and fear of cancer relapse. During the follow-up, the main focus of the oncologist is on identifying signs of cancer progression. At the same time, psychoemotional disorders may have a greater impact on the quality of life and the disease course, necessitating their active identification and assistance. NCCN DT can serve as a screening tool for actively identifying patients with borderline and higher levels of distress and psychoemotional problems.

The NCCN DT was first described by Roth et al. in 1998 and was used to assess distress in patients with male reproductive system cancer (prostate cancer).[11] The following year, a list of common problems (the “Problem List”) was added based on expert consensus and the evidence available at the time, which allowed personalizing psychological support to patients.[12] The List of problems was last reviewed and updated in 2022.[13] This updated and refined list allowed us to consider the problems of cancer patients more broadly, including in terms of identity crisis.

The data we obtained showed that the life quality of reproductive system cancer patients is affected not only by the direct results of cancer treatment. 62% of patients stated that their level of distress was above the limit almost a year after the successful treatment, which indicated the need for further examination, psychological support and, if necessary, treatment.

RL Johnson et al. used the NCCN DT to examine 143 women who received chemotherapy for gynecologic cancer over two years. More than half (57%) of the examined women rated their degree of distress as four or more. At the same time, no relationship was found between the cancer type, stage, and insurance status.[14] In our opinion, certain social insecurity and military status influenced the results of the studied group. L. Kuroki et al. also noted that socially disadvantaged gynecologic cancer patients were more likely to report severe distress and family (p < 0.001), emotional (p < 0.001), and other (p < 0.01) problems than patients with Medicare/commercial insurance.[15] Our study’ peculiarity was that we selected patients with a favorable oncological prognosis and examined them after the treatment. Instead, numerous studies using DT were conducted after surgical interventions against the background of chemotherapy or immediately thereafter. J. AWall applied DT to examine patients with ovarian cancer receiving chemotherapy. Among them, the level of distress above the limit was found in 46%.[16] The researcher indicated that when using DT, a certain number of false-positive results may be observed. Therefore, DT can work well as a screening tool at the first stage of identifying psychoemotional disorders, but the second stage is required – psychological counseling and a psychotherapist’s or a psychiatrist’s assistance, as needed.[16] All patients in our cohort have had or are scheduled to undergo counseling, follow-up examinations using depression scales, etc.

The level of distress after the treatment of gynecological cancer is more pronounced in young women, [17,18] which is caused not only by post-castration changes. Some psychological problems remain after the appointment of hormone replacement therapy and even when performing surgeries that preserve fertility. Therefore, screening, identifying, and correcting psychoemotional disorders should become a recommended component of cancer care.[19]

In conclusions: More than half of gynecological cancer patients were found to have psychoemotional disorders and a level of distress above the limit after the successful completion of cancer treatment. NCCN DT is an effective means of screening for active identification of psychoemotional disorders and assessment of the degree of distress in cancer patients.
Testing should be carried out not only immediately after the treatment but also in the long term (after 6 to 12 months) because psychoemotional manifestations of distress (identity crisis) turned out to exacerbate over time.

References


