QUALITY OF LIFE AND EMOTIONAL STATUS IN PATIENTS WITH PRIMARY AND METASTATIC BONE TUMORS

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Abstract

The purpose of this study is to identify quality of life among patients with osteosarcoma, chondrosarcoma, giant cell tumor and bone metastases using disease-specific instrument (QLQ-C30 and module BM 22) and reveal these patients’ emotional status. A total of 120 patients with bone tumors were evaluated since 2012 till 2015. There are four groups depending on diagnosis: the group of patients with osteosarcoma (41 persons), patients with giant cell tumor (31 persons), the group of chondrosarcoma patients (30 persons) and patients with bone metastases (adenocarcinoma) (17 persons). Evaluations included «SF-36 Health Status Survey», Quality of Life Questionnaire-Core 30 of European Organization for Research and Treatment Cancer with module Bone Metastases 22, “Dominant emotional condition”, “Coping strategies”. Patients with bone metastasis have lower quality of life compared to patients with primary bone tumors. Patients with primary bone tumors are inclined to anxiety, emotional instability. Patients with bone metastases have more poor quality of life in the parameters of general health, vitality and pain compared to patients with osteosarcoma, chondrosarcoma and giant cell tumor (p<0.05). This corresponds to objective physical state of these patients. Emotional status among patients with bone metastases was higher than in other groups (p<0.05).

Keywords: quality of life, emotional status, bone tumor, SF-36, QLQ-C30, BM 22, follow up
Relevance

Bone tumors are rare and heterogeneous group of musculo-skeletal diseases. Primary malignant bone tumors are infrequent human tumors. They make less than 1% in the structure of oncological morbidity. Near 1500 primary bone sarcoma are revealed in Russia every year. At the same time the frequency of metastatic bone lesion is high. Bone metastases progress in 60-70% of oncological patients (Karnofsky, Burchenal, 1949; Sun, Hu, Jin, Li, & Yu, 2012; Oren, Zagury, Katzir, Kollender, & Meller, 2001; Eiser, & Grimer, 1999; Christ, Lane, & Marcove, 1995; Salsman, Pearman, & Cella, 2012).

Since the beginning of 1970-s the growth of survival in patients with bone tumors has been revealed. Owing to new chemotherapy, elaboration of bone tumors diagnosis methods and oncological orthopedics success most patients may be cured presently (Eiser, Darlington, Stride, & Grimer, 2001). And limb sparing surgery forms more than 80% cases. This makes issue of quality of life relevant (Kasimova, & Zhiryaeva, 2009; Wasserman, Trifonova, & Shelkova, 2011; Eiser, 2009).

The issue of quality of life in oncological patients is a wide discussing problem in present-day science (Kulikov, 2003; Ware, Snow, Kosinski, Gandek, 1993). General health in a patient may be complicated with basic disease manifestations and side effects of the therapy. During last decades scientific research of health related quality of life is developing fast worldwide. Researchers emphasize the problem of quality of life in oncological patients taking into account the real burden of the disease, vital threat, often following illness, and frequency of psychological problems in oncological patients (Wasserman, Ababkov, Trifonova, 2010; Tkhostov, & Nelyubina, 2011). All basic aspects of person functioning - physical, psychological (spiritual), social - in the system (integrate and interacting) form are presented in the HRQoL concept. Emotional status has the same importance in the treatment and rehabilitation of oncological patients; it determines largely the compliance of the patient, which is significant factor of treatment efficacy and patients’ survival. The need of quality of life assessment after treatment increases seeing lifetime growth and therapy results improvement in patients with bone tumors (WHO, 1996; Luriya, 1977; Ngoh, 2009; Aaronson, Ahmedzai, Bergman, Bullinger, Cull, Duez, Filiberti, Flechtner, Fleishman, de Haes, 1993).
In this study for the first time in the Russian practice comparative analysis in patients with primary and metastatic bone tumors is done using questionnaires SF-36, QLQ-C30 with the special module BM-22 and methods determining psychological status (Fayers, Aarson, Bjordal, Sullivan, 1995; Danilov, 2008).

**Materials and methods**

Patient selection. Study participants from 2012 till 2015 (N=120) were in patients with primary and metastatic bone tumors of N.N. Blokhin Russian Cancer Research Center.

According the research goals general group was split into four groups depending on a diagnosis. The first one (A) included 41 patients diagnosed with osteosarcoma, the average age 27 ± 2. There were 25 (61%) males and 16 (31%) females in this group.

The second group (B) included 31 patients with giant cell tumor, the average age 36 ± 3. There were 13 (42%) males and 18 (58%) females. The third group (C) included 30 patients diagnosed with chondrosarcoma, the average age 45 ± 3. Males prevailed in this group; they were 24 (80%) patients. Females were 6 (20%) patients. The fourth group (D) included 18 patients with bone metastases (primary diagnosis is adenocarcinoma).

There were 14 (78%) males and 4 (22%) females. The average age was 55 ± 2. All patients had surgical or complex treatment.

Patients characteristics. The duration of the disease in patients with bone tumor is given in Table 1.

**Table 1.**

The duration of the disease in patients with bone tumor

<table>
<thead>
<tr>
<th>Duration of the disease</th>
<th>Osteosarcoma n=41 A</th>
<th>Giant cell tumor n=31 B</th>
<th>Chondrosarcoma n=30 C</th>
<th>Metastases n=18 D</th>
</tr>
</thead>
<tbody>
<tr>
<td>M ± m</td>
<td>M ± m</td>
<td>M ± m</td>
<td>M ± m</td>
<td>M ± m</td>
</tr>
<tr>
<td>Since diagnosed (months)</td>
<td>16.68±3.73</td>
<td>8.06±2.1</td>
<td>18.03±6.27</td>
<td>25.44±6.7</td>
</tr>
<tr>
<td>Since symptoms appeared (months)</td>
<td>20.54±3.58</td>
<td>12.66±2.64</td>
<td>31.93±8.94</td>
<td>25.78±6.66</td>
</tr>
</tbody>
</table>

The results presented in Table 1 show that the longest period between symptoms appearance and diagnosis is in the group of patients with chondrosarcoma (13.9 months). The treatment in patients with giant cell tumor lasts the shortest time. The average treatment
lasting since diagnosis is 8.06 months. Patients with osteosarcoma and chondrosarcoma have been treated about half a year at the research moment. The average treatment lasting in patients with bone metastases was 25.44 months at research moment. The status of therapy is given in Table 2.

Table 2.

<table>
<thead>
<tr>
<th>Therapy status</th>
<th>Osteosarcoma n=41 A</th>
<th>Giant cell tumor n=31 B</th>
<th>Chondrosarcoma n=30 C</th>
<th>Metastases n=18 D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M ± m</td>
<td>M ± m</td>
<td>M ± m</td>
<td>M ± m</td>
</tr>
<tr>
<td>Surgical treatment</td>
<td>5 per. (12%)</td>
<td>31 per. (100%)</td>
<td>27 per. (90%)</td>
<td>13 per. (76%)</td>
</tr>
<tr>
<td>Complex treatment</td>
<td>36 per. (88%)</td>
<td>0</td>
<td>3 per. (10%)</td>
<td>4 per. (24%)</td>
</tr>
</tbody>
</table>

As results presented in Table 2 show, most patients with osteosarcoma had complex treatment. All patients with giant cell tumor and most of the patients with chondrosarcoma and bone metastases had surgical treatment.

Methods description. The methods were:

1. «SF- 36 Health Status Survey» was used for determining quality of life in patients with bone tumor. A total of 36 items of the questionnaire form 8 scales: General Health (GH), Physical Functioning (PF), Role-Physical (RP), Role-Emotional (RE), Social Functioning (SF), Bodily Pain (BP), Vitality (VT), Mental Health (MH). Scores range from 0 till 100. A total of 100 scores present the best health. The scales form two parameters «physical health» (first four scales) and “mental health” (last four scales).

2. “Quality of Life Questionnaire Core-30” was designed by the Study Group on Quality of Life of European Organization for Research and Treatment Cancer. The use of QLQ-C30 shows that it is highly sensitive tools for evaluating of quality of life in patients with oncological disease apart from its type. The modern version of EORTC QLQ-C30 includes 30 questions and consists of 5 functional scales (Physical functioning, Role functioning, Emotional functioning, Cognitive functioning, Social functioning), 3 symptom scales (Fatigue, Nausea and vomiting, Pain), Global health status and 6 symptom items (Dyspnoea, Insomnia, Appetite loss, Constipation, Diarrhoea, Financial difficulties).
3. Module BM22 which was used for studying specific symptoms showed quality of life in patients with malignant bone tumor. The module consists of 20 questions and has 2 Symptom scales (Painful Sites and Pain Characteristics) and 2 Functional scales (Functional Interference and Psychosocial Aspects).

4. Method «Coping strategies» is adapted edition of questionnaire «The Ways of Coping Questionnaire» – WOSQ by R. Lazarus and S. Folkman with obtaining normative data on the native sample. Method aims at revealing coping strategies in stressful and difficult situations. The strategies include confrontation, distancing, self-control, search for social support, acceptance of responsibility, escape, plan to solve the problem, positive reconsideration.

Statistical methods. Statistical significance of distinctions between groups was calculated with Student’s t-criterion test. SPSS 20.0 and MICROSOFT EXCEL 2007 were used for processing the results.

Results and their discussion

The assessment of general health status in patients with bone tumor on Karnovsky scale and ECOG is given in Table 3.

Table 3.

<table>
<thead>
<tr>
<th>Karnovsky index/ECOG scale</th>
<th>Osteosarcoma n=41 A</th>
<th>Giant cell tumor n=31 B</th>
<th>Chondrosarcoma n= 30 C</th>
<th>Metastases n =18 D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M ± m</td>
<td>M ± m</td>
<td>M ± m</td>
<td>M ± m</td>
</tr>
<tr>
<td>Karnovsky index</td>
<td>80 ± 1.79</td>
<td>78.89±2.2</td>
<td>80.5±2.15</td>
<td>71.18±2.63</td>
</tr>
<tr>
<td>ECOG scale</td>
<td>1.23 ± 0.1</td>
<td>1.41±0.1</td>
<td>1.4 ± 0.12</td>
<td>2.12±0.12</td>
</tr>
</tbody>
</table>

The results presented in Table 3 show, that objective physical status in patients with primary bone tumor significantly better than objective physical status in patients with bone metastases (p<0,05). And objective physical status in patients with different forms of primary bone tumor is the same.
Figure 1. Health related quality of life indices in patients with bone tumor (SF-36)

According to the results patients with bone metastases assess significantly lower their general health and treatment prospects, than patients with osteosarcoma (p<0.1). Patients with chondrosarcoma have lower influence of their physical state on daily activities, than patients with giant cell tumor and bone metastases (p<0.1).

Besides patients with bone metastases are more limited in daily activity and social functioning due to deterioration of emotional state, than patients with chondrosarcoma (p<0.1). Patients with bone metastases have more limited activity caused by pain intensity and have lower vitality than other patients (p<0.05).

Figure 2. Health related quality of life indices in patients with bone tumor (QLQ C-30). Functional scales.
Figure 3. Health related quality of life indices in patients with bone tumor (QLQ C-30 and BM 22). Symptom scales.

These data are consistent and complimentary with the results of studying health related quality of life researched using SF-36. QLQ C-30 questionnaire was designed as a method for quality of life assessment especially in patients with a malignant tumor. Using QLQ C-30 differences in the patient assessment of general health were revealed. Patients with bone metastases assess their health significantly worse than other patients (p<0.05). Besides patients with osteosarcoma evaluate their general health higher than patients with giant cell tumor (p<0.05).

Patients with chondrosarcoma have higher physical functioning and are less restricted in daily activities than patients with bone metastases (p<0.1), and these data are also consistent with the results of studying health related quality of life researched using SF-36. Social functioning of patients with chondrosarcoma is higher than patients with bone metastases (p<0.05). Besides according QLQ C-30 data patients with chondrosarcoma have higher social functioning than patients with giant cell tumor (p<0.05).

Patients with bone metastases suffer more dispnoea (p<0.05), than patients with primary bone tumor (p<0.05). And patients with bone metastases have the most intense pain compared to all other patients (p<0.05).
According BM 22 data, quality of life in patients with bone metastases is lower than quality of life in patients with primary bone tumors on the scale “Pain Sites” (p<0.01): patients with bone metastases characterize their pain as more widespread than other patients. Besides patients with bone metastases have more intensity pain than patients with osteosarcoma (p<0.1). Despite this, patients with bone metastases have more functional restrictions due to bone incision, than other patients (p<0.05).

Coping strategies. Patients with bone metastases are more susceptible to search for social support, than patients with primary bone tumor (p<0.05). Patients with bone metastases are inclined to looking for opportunity to use external resources for solving problem situation. For them focus on interaction with other people and expectation for support are specific. The drawback of searching of social support is a possibility of formation of dependence on other people.

Patients with giant cell tumor are more inclined to accept their part in problem origin and their responsibility for its solution (p<0.1). The data are consistent with the results of the questionnaire “Dominant emotional condition”. Patients with giant cell tumor have higher values than patients with chondrosarcoma on the scale “Life satisfaction-dissatisfaction”. This fact means that patients with giant cell tumor are more susceptible to accept responsibility for their life.

Strategy “Escape” is more prevalent among patients with osteosarcoma than in the group of patients with giant cell tumor and chondrosarcoma (p<0.05). Patients with osteosarcoma are inclined to try to overcome negative experience at the expense of avoidance. It may influence their quality of life.

Patients with osteosarcoma (p<0.1) and bone metastases (p<0.05) are more susceptible to transpersonal and philosophic comprehension of the problem situation.

Quality of life in patients with bone tumor was significantly worse, than in general population. Comparative analysis of quality of life and emotional status in patients with different nosological types of bone tumor allows revealing the main characteristics in patients of different groups and making conclusion about potential psychotherapy in each nosological group.
Patients with bone metastases have a poorer quality of life than patients with primary bone tumor on parameters of physical functioning, possibility of daily activities, social functioning and general health. Their pain intensity corresponds to the objective physical status in patients of this group.

Patients with bone metastases are least inclined to denial of the disease and are excessively vulnerable compared to patients with primary bone tumor, that in addition to improving quality of life on the parameter of emotional status may increase compliance in patients.

And patients with bone metastases have effective coping strategies, such as search for social support and positive reconsideration. This fact also has a positive impact on the quality of life of patients and their relationship with the doctor.

Thus, according the results, emotional status in patients with primary bone tumor was characterized by patients increased tendency to have problems in a wide range of life situations, reduced emotional stability. When creating a program of psychological care for patients of this group first of all it is important to focus on correcting the anxiety and emotional instability.

Coping behavior in patients with osteosarcoma was characterized in terms of prevalence of denial and problem escape strategies. So program of psychological helping in patients with osteosarcoma may include therapy of denial disease or its severity and form adaptive coping behavior.

Furthermore, high criticalness in self-assessment, negative attitude to themselves and life dissatisfaction are typical in patients with chondrosarcoma. Psychotherapy in these patients may include self-esteem correction and formation of patients’ readiness to change their life making it more sufficient for themselves.

Patients with giant cell tumor have lower quality of life on the parameters of general health and role-physical scales compared to patients with osteosarcoma and chondrosarcoma. Though objective physical status in patients with giant cell tumor and surgery do not differ from corresponding indices in patients with bone sarcoma.

Thus it was revealed that patients’ psychological status influence their quality of life assessment.
The issue of quality of life in patients with bone tumor needs further research, especially, in the direction of applying results of quality of life study in clinical practice.

In conclusion, patients with bone metastases have lower quality of life on parameters of general health, physical functioning and fatigue in comparison to patients with osteosarcoma, giant cell tumor and chondrosarcoma (p<0.05), that corresponds to objective physical status of patients.

Emotional status in patients with bone metastases was higher than in other patients, that is due to high degree of compliance.

References


