ТЕРАПІЯ ТА РЕАБІЛІТАЦІЯ

ASSESSMENT OF MULTIDOMAIN QUALITY OF LIFE IN PATIENTS FOLLOWING SURGICAL TREATMENT OF MALIGNANT TUMORS OF THE MAXILLOFACIAL REGION UNDER THE INFLUENCE OF PHYSICAL THERAPY

ОЦІНЮВАННЯ МУЛЬТИДОМЕННОЇ ЯКОСТІ ЖИТТЯ ПАЦІЄНТІВ З НАСЛІДКАМИ ОПЕРАТИВНОГО ЛІКУВАННЯ ЗЛОЯКІСНИХ ПУХЛИН ОРГАНІВ ЩЕЛЕПНО-ЛИЦЕВОЇ ДІЛЯНКИ ПІД ВПЛИВОМ ФІЗИЧНОЇ ТЕРАПІЇ

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Abstracts

Objective – to assess the effectiveness of physical therapy in restoring multidomain quality of life in patients with the consequences of surgical treatment of malignant neoplasms of the maxillofacial region, taking into account functional, psychological and social indicators.

Material. The study included 12 patients (men and women aged 40–69 years) who underwent surgery for malignant tumors of the maxillofacial region. All patients had individually made prostheses to close the defects and provide functional compensation. The rehabilitation program included 21 physical therapy sessions, each lasting up to 60 minutes. During the normative part, therapeutic exercises for masticatory and facial muscles, neck muscles, shoulder girdle, manual mobilization of soft tissue scars, breathing exercises (nose and mouth breathing), relaxation exercises were performed. The variable part included measures selected according to individual indications – manual correction of lymphostasis, kinesiological taping of the face and neck area to reduce edema and facilitate exercise performance, swallowing training, exercises to improve voice function, individual functional training to correct dysfunctions associated with the maxillofacial area and neck. Quality of life was assessed using the OHIP-14, EORTC QLQ-C30, SF-36 questionnaires.

Results. Before therapy, participants demonstrated a pronounced decrease in quality of life on all scales. According to OHIP-14, most domains had the maximum possible median of 8 points, the total score was 52 [51; 54], which indicates severe somatic and socio-psychological maladjustment. According to EORTC QLQ-C30 Global health status – 25 [9; 41], physical functioning – 23 [11; 31], emotional – 15 [6; 24]. SF-36 indicated reduced energy, pain, poor psycho-emotional state and limited social activity. After physical therapy, a statistically significant improvement was observed in most domains: in OHIP-14 the total score decreased to 37 [34; 42]; in QLQ-C30 the indicators of physical, emotional, social functioning increased; in SF-36 the indicators of Vitality, Role physical, Bodily pain, Mental health improved.

Conclusions. The introduction of physical therapy into the rehabilitation program of patients with the consequences of surgical treatment of maxillofacial tumors contributes to a significant improvement in physical, emotional and social functioning, a decrease in symptoms and an increase in the quality of life.

Key words: physical therapy, rehabilitation, oncology, maxillofacial region, quality of life.

Мета – оцінити ефективність фізичної терапії у відновленні мультидоменної якості життя у пацієнтів із наслідками оперативного лікування злоякісних новоутворень щелепно-лицевої ділянки з урахуванням функціональних, психологічних та соціальних показників.

Матеріал. У дослідженні взяли участь включено 12 пацієнтів (чоловіки та жінки віком 40–69 років), які перенесли хірургічне втручання з приводу злоякісних пухлин щелепно-лицевої ділянки. Усі пацієнти мали індивідуально виготовлені протези для закриття дефектів та функціональної компенсації. Реабілітаційна програма включала 21 сеанс фізичної терапії, кожен тривалістю до 60 хвилин. Упродовж нормативної частини виконували терапевтичні вправи для жувальної та мімічної мускулатури, м'язів шиї, плечового пояса, мануальну мобілізацію рубців м'яких тканин, дихальні вправи (дихання носом та ротом), вправи для розслаблення. Варіативна частина включала заходи, вибрані за індивідуальними показаннями, – мануальна корекція лімфостазу, кінезіологічне тейпування ділянки обличчя та шиї для зменшення набряку та полегшення виконання вправ, тренування ковтання, вправи для покращення голосової функції, індивідуальні функціональні тренування для корекції дисфункцій, пов'язаних зі щелепно-лицевою ділянкою та шиєю. Оцінку якості життя проводили за опитувальниками OHIP-14, EORTC QLQ-C30, SF-36.

Результати. До терапії учасники демонстрували виражене зниження якості життя за всіма шкалами. За OHIP-14 більшість доменів мали максимально можливу медіану 8 балів, загальний бал – 52 [51; 54], що вказує на тяжку соматичну та соціально-психологічну дезадаптацію. За EORTC QLQ-C30 Global health status – 25 [9; 41], фізичне функціонування – 23 [11; 31], емоційне – 15 [6; 24]. SF-36 вказував на знижену енергійність, біль, поганий психоемоційний стан та обмежену соціальну активність. Після фізичної терапії спостерігалось статистично значуще покращення за більшістю доменів: у OHIP-14 загальний бал зменшився до 37 [34; 42]; у QLQ-C30 зросли показники фізичного, емоційного, соціального функціонування; у SF-36 покращилися показники Vitality, Role physical, Bodily pain, Mental health.

Висновки. Впровадження фізичної терапії у програму реабілітації пацієнтів з наслідками хірургічного лікування пухлин щелепно-лицевої ділянки сприяє достовірному покращенню фізичного, емоційного та соціального функціонування, зменшенню симптомів і підвищенню якості життя.

Ключові слова: фізична терапія, реабілітація, онкологія, щелепно-лицева ділянка, якість життя.

Introduction. Tumors of the maxillofacial region occupy one of the important places in the overall prevalence of oncological conditions, and there is a steady increase in the incidence of malignant tumors [2]. The effectiveness of their clinical treatment depends on early diagnosis. Typically, 84% of these patients consult otolaryngologists, 9–10% – dentists and only 5–6% – oncologists. Early diagnosis of the disease depends on the adequate actions of these specialists, but the low oncological alertness of primary care physicians regarding such diagnoses and the complexity of differential diagnosis lead to the fact that patients are radically treated only in advanced stages of the disease [6; 13].

Oncological diseases of the maxillofacial area (tumors of the oropharynx, cheek, nasopharynx, maxillofacial mucosa) and the corresponding surgical interventions, radiation or chemotherapy pose not only a threat to the patient's life, but also a significant impact on the functional, emotional, social and physical components of the quality of life. The group of patients after treatment for head and neck cancer belongs to the category with a high risk of long-term consequences: chewing disorders, swallowing, articulation, aesthetic changes, side effects of drugs, chronic pain, fatigue, impaired mobility of the neck and shoulder girdle [6; 14]. As a result of studies, it was demonstrated that the level of physical activity among people after treatment for head and neck cancer is significantly reduced, while there are associations between the total time of physical activity and physical well-being [11]. It has been proven that rehabilitation interventions have a positive effect on the functionality of these patients [9].

Oncological diseases in the orofacial area lead to disorders that cover several domains simultaneously: external (facial aesthetics), functional (chewing, speech, swallowing), emotional (anxiety, depression, social isolation), as well as professional/social participation. Accordingly, attention is focused on the fact that patients with head and neck cancer have special challenges that require a comprehensive approach to assessing the quality of life [4; 9; 11]. In the context of Ukraine, this problem acquires even greater

social significance: on the one hand, oncopathology of the maxillofacial area has serious consequences for work capacity, appearance, social integration; on the other hand, the resource-limited medical system often does not provide comprehensive rehabilitation focused on restoring the quality of life after oncological intervention. Physical therapy as a component of rehabilitation after cancer treatment and other conditions is an important factor that can potentially improve the results of the intervention [1; 5; 8; 10]. Although functional interventions in the maxillofacial area are presented in certain works [7; 12], specific physical therapy programs for patients after cancer intervention in the maxillofacial area, their impact on multidomain quality of life (physical, psychological, social from different assessment positions) are not sufficiently covered, which determines the relevance of the presented work.

The purpose of the study is to assess the effectiveness of the developed physical therapy program based on the dynamics of multidomain quality of life indicators in patients with the consequences of surgical treatment of oncological processes of the maxillofacial region.

Materials and methods. During the study, 12 people with the consequences of surgical treatment of oncological processes of the maxillofacial region were examined. It should be noted that there was a great variability in the types of lesions, the volume of interventions, as well as in the means of reconstruction, including cosmetic and functional prosthetics.

Inclusion criteria: the presence of a malignant tumor of soft tissues or bones of the maxillofacial region, the surgical treatment of which involved resection of part of the upper or lower jaw with concomitant soft tissue disorders; II–III stages of the oncological process; at least 6 months after resection; closure of the jaw defect with an individual prosthesis; histological picture – cancer, sarcoma; consent to participate in the study.

Exclusion criteria: malignant tumors, in the process of which the lower jaw, tongue were completely removed; defect of the eye orbit; presence of a tracheostomy; IV stage of the oncological process; large defects of the upper jaw, facial soft tissues and complete secondary adentia of the remaining alveolar process on the upper jaw; infected wounds; refusal to participate in treatment and rehabilitation.

All patients were observed by an oncologist and a physical and rehabilitation medicine doctor, receiving individual treatment – pain relief, chemotherapy, etc.

The developed physical therapy program was designed to correct and improve the quality of life by reducing lymphostasis, dysfunction of the maxillofacial area (chewing, swallowing, breathing), improving the psychoemotional state and facilitating social adaptation. It consisted of 21 rehabilitation sessions lasting one hour each. The patient's condition could affect the frequency of interventions; however, it was not recommended to take breaks between sessions lasting more than 48 hours.

Each session consisted of two parts – normative and variable. During the normative part, therapeutic exercises for the masticatory and facial muscles, neck muscles, shoulder girdle, manual mobilization of soft tissue scars, breathing exercises (nose and mouth breathing), relaxation exercises were performed. The variable part included measures selected according to individual indications – manual correction of lymphostasis, kinesiological taping of the face and neck area to reduce swelling and facilitate the performance of exercises, swallowing training, exercises to improve voice function, individual functional training to correct dysfunctions associated with the maxillofacial area and neck.

The condition of the patients was assessed in various ways – from the standpoint of the quality of life of a dental patient (Oral Health Impact Profile), an oncological patient (European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire), and the general quality of life related to health (SF-36).

The 14-item Oral Health Impact Profile – 14 (OHIP-14) consists of 7 domains [15].

Cancer-related quality of life was assessed using the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – Core 30 (EORTC QLQ-C30), a 30-item questionnaire grouped into functional, symptomatic, and general scales [3].

Health-related quality of life was assessed using the non-specific SF-36 (The Short Form-36) questionnaire.

The study was conducted in accordance with the principles of the World Medical Association Declaration of Helsinki "Ethical Principles of Medical Research Involving Human Subjects". Informed consent was obtained from all patients enrolled in the study. The study protocol was discussed and approved at a meeting of the Bioethics Commission of the Vasyl Stefanyk Carpathian National University.

Statistical processing of the results was carried out using the IBM SPSS Statistics software package, version 26.0 (IBM Corp., Armonk, NY, USA). The nature of the data distribution was previously checked using the Shapiro–Wilk test. For indicators with a normal distribution, parametric statistical methods were used, in particular, the Student test for related samples (t-test). The results were presented in the form of the mean value and standard deviation (x±S). For variables with a distribution that differed from normal, non-parametric methods were used – the Wilcoxon test for paired samples. The data are presented as the median with the interquartile range (Me [Q25; Q75]). The level of statistical significance was set at $p<0.05$.

Research results. At the initial examination according to the OHIP-14 questionnaire scales, a high level of functional, physical, psychological and social limitations was revealed, which indicates a significant decrease in the quality of life of this category of patients (Table 1).

All functional domains (functional limitation, physical / psychological / social disability, handicap) at the initial examination had the maximum possible median value – 8 points [Q25; Q75 = 8; 8], which indicates a pronounced life maladjustment and a significant loss of functionality after surgery. The psycho-emotional state of the patients was also depressed – in the psychological discomfort and psychological disability domains the same maximum values (8 points) were registered, which indicates a high level of emotional stress and anxiety.

In addition to functional and psychological limitations, the patients complained of severe physical pain – the average score in the physical pain domain was 4 [3; 4], which corresponds to frequent or constant pain syndrome. The total OHIP-14 score averaged 52 [51; 54] out of 56 possible, indicating a profound level of negative impact of the disease on quality of life.

After the course of physical therapy, a statistically significant improvement was recorded in all domains ($p<0.05$). The largest decrease in the median value was observed in the functional areas. Functional limitation decreased from 8 to 5 [5; 6], indicating an improvement in the performance of daily motor and speech functions. Physical disability decreased from 8 to 5 [4; 6], reflecting a decrease in difficulties with chewing, eating and self-care. Social disability and Handicap decreased from 8 to 6, indicating an improvement in social interaction and adaptation.

In the psychological dimension, a decrease in tension and internal discomfort was recorded: Psychological discomfort from 8 to 7 [6; 7], Psychological disability from 8 to 6 [6; 7].

In the Physical pain domain, a halving of pain was noted – from 4 [3; 4] to 2 [2; 3], which indicates a positive effect of physical therapy on musculoskeletal and postoperative pain.

The total OHIP-14 score after therapy decreased to 37 [34; 42], which confirms a comprehensive improvement in the physical, psychological and social condition of patients.

The results of the initial survey according to the EORTC QLQ-C30 indicated a low level of general well-being and functioning (Table 2). In particular, Global health status had a low median value – 25 [9; 41], which indicates a depressed general state. The indicators of physical (23 [11; 31]), role (21 [9; 32]) and emotional functioning (15 [6; 24]) were significantly reduced, which indicates limitations in performing daily duties, emotional instability and general maladjustment. Social functioning was also at a low level – 29 [12; 43], which reflects difficulties in integrating patients into the social environment. At the same time, cognitive functioning remained relatively preserved – 72 [66; 80].

Symptomatic scales demonstrated a pronounced clinical burden: patients complained of increased fatigue (49 [39; 58]), pain (31 [23;

Table 1

Dynamics of quality of life according to OHIP-14 in patients with the consequences of surgical treatment of malignant tumors of the maxillofacial region under the influence of physical therapy (Me [Q25; Q75])

Questionnaire domain, scores	Before physical therapy	After physical therapy
Functional limitation	8 [8; 8]	5 [5; 6]*
Physical pain	4 [3; 4]	2 [2; 3]*
Psychological discomfort	8 [8; 8]	7 [6; 7]*
Physical disability	8 [8; 8]	5 [4; 6]*
Psychological disability	8 [8; 8]	6 [6; 7]*
Social disability	8 [8; 8]	6 [6; 7]*
Handicap	8 [8; 8]	6 [5; 6]*
Total score	52 [51; 54]	37 [34; 42]*

Note (here and in the following tables): * – $p<0,05$, statistically significant difference between the corresponding parameters at the initial and repeated examinations

Table 2

Dynamics of the results of determining the quality of life according to the EORTC QLQ-C30 questionnaires in patients with the consequences of surgical treatment of malignant tumors of the maxillofacial region under the influence of physical therapy (Me [Q25; Q75])

Questionnaire domain, scores	Before physical therapy	After physical therapy
Global health status	25 [9; 41]	38 [20; 46]
Functional scales		
Physical functioning	23 [11; 31]	50 [41; 58]*
Role functioning	21 [9; 32]	35 [22; 48]*
Emotional functioning	15 [6; 24]	26 [19; 40]*
Cognitive functioning	72 [66; 80]	70 [65; 79]
Social functioning	29 [12; 43]	38 [21; 50]*
Symptom scales		
Fatigue	49 [39; 58]	34 [20; 45]*
Nausea and vomiting	11 [2; 18]	15 [6; 23]
Pain	31 [23; 42]	22 [18; 39]*
Dyspnea	19 [10; 26]	10 [6; 20]*
Insomnia	33 [21; 45]	20 [14; 33]*
Appetite loss	35 [20; 47]	19 [8; 36]*
Constipation	46 [33; 59]	35 [23; 48]
Diarrhea	34 [21; 45]	25 [11; 39]
Financial difficulties due to illness	79 [66; 87]	75 [63; 83]

42]), sleep disturbances (33 [21; 45]), loss of appetite (35 [20; 47]), and also had high scores on the dyspnea, constipation, and diarrhea scales (from 19 to 46). The level of financial difficulties was especially critical – 79 [66; 87], which indicates significant socio-economic pressure associated with the disease and treatment. After completing the course of physical therapy, positive dynamics were noted in most functional and symptomatic indicators. Physical functioning almost doubled – to 50 [41; 58], which indicates a significant improvement in motor abilities and self-care abilities. Role functioning (up to 35 [22; 48]) and emotional state (up to 26 [19; 40]) also increased. Social interaction improved, as evidenced by an increase in the social functioning score to 38 [21; 50], while the cognitive domain remained stable (70 [65; 79]). Among the symptoms, the most pronounced decrease was observed in the scores of fatigue (up to 34 [20; 45]), pain (up to 22 [18; 39]), shortness of breath (up to 10 [6; 20]), insomnia (up to 20 [14; 33]) and loss of appetite (up to 19 [8; 36]). This indicates a positive effect of physical therapy on reducing both somatic and psychoemotional complaints. In contrast, the levels of nausea,

constipation, diarrhea and financial difficulties remained relatively stable.

The initial results of the SF-36 questionnaire showed significant deterioration in all domains of the questionnaire, which confirms the deep maladjustment and limitations in the physical and psychosocial spheres in the examined contingent of patients (Table 3). The lowest indicators were recorded in the General health area – 18 [7; 31], as well as Vitality – 22 [13; 37], which indicates reduced energy, rapid fatigue and a subjective feeling of deterioration of the general condition. The indicators Physical function – 26 [12; 41] and Role physical – 29 [11; 42] also indicate significant difficulties in the implementation of physical activities, self-care and daily activities. The indicator Bodily pain (31 [20; 46]) reflects a moderately pronounced pain syndrome, which negatively affects daily activity.

Social and psychoemotional indicators were also reduced. Social function was assessed at 38 [21; 50], reflecting difficulties in social interaction. Role emotional (41 [22; 58]) and Mental health (44 [26; 59]) indicate emotional exhaustion, difficulty concentrating, deterioration of mood and general psychological well-being.

After the course of physical therapy, a statistically significant improvement was found on all scales of the questionnaire ($p < 0.05$). In particular, the domain Physical function increased to 39 [13; 50], and Role physical – to 46 [29; 64], indicating an improvement in the ability to perform everyday tasks. Pain reduction (Bodily pain) – to 46 [28; 55] – indicates the effectiveness of physical interventions in reducing somatic symptoms.

Positive changes were also recorded in General health (up to 29 [13; 43]) and Vitality (up to 40 [25; 53]), which indicates an improvement in the subjective feeling of health and an increase in energy potential. The increase in social activity and psycho-emotional stability is important: Social function – 49 [37; 62], Role emotional – 52 [37; 68], Mental health – 56 [39; 68]. This indicates a decrease in psycho-emotional pressure, improvement in mood and social integration.

Discussion. Our results demonstrate that patients after surgical treatment of maxillofacial tumors were in a state of pronounced functional, symptomatic and socio-psychological maladaptation. This is consistent with the literature that after surgical intervention in the head and neck area, patients are at high risk of long-term disorders of chewing, speech, aesthetics, mobility, as well as reduced quality of life [4; 6; 9].

The observed improvement in functional scales and symptoms after the physical therapy program emphasizes the importance of implementing rehabilitation interventions, including exercises for the muscles of the masticatory group, scar mobilization, breathing practices and movement therapy. This is consistent with studies demonstrating the positive impact of physical activity and rehabilitation on the quality of life of patients with oncological diseases of the maxillofacial region [1; 4; 5].

At the same time, it should be emphasized that financial difficulties remained at a high level and did not change significantly, which indicates a static socio-economic component in the lives

Table 3

Results of determining the quality of life according to the SF-36 questionnaire in patients with the consequences of surgical treatment of malignant tumors of the maxillofacial region under the influence of physical therapy (Me [Q25; Q75])

Questionnaire domain, scores	Before physical therapy	After physical therapy
Physical function	26 [12; 41]	39 [13; 50]*
Role physical	29 [11; 42]	46 [29; 64]*
Bodily pain	31 [20; 46]	46 [28; 55]*
General health	18 [7; 31]	29 [13; 43]*
Vitality	22 [13; 37]	40 [25; 53]*
Social function	38 [21; 50]	49 [37; 62]*
Role emotional	41 [22; 58]	52 [37; 68]*
Mental health	44 [26; 59]	56 [39; 68]*

of patients, which goes beyond the scope of physical rehabilitation. This indicates the need for a multidisciplinary approach, which should include social support, work with a psychologist and economic adaptation [6; 14]. In addition, stability or slight improvement in cognitive functioning (according to EORTC QLQ C30) and certain gastrointestinal symptoms (constipation, diarrhea, nausea) may indicate the need for additional intervention or longer follow-up in these areas. Rehabilitation should be considered not only as physical therapy, but also as a set of measures that include dental, psycho-emotional, nutritional and speech therapy support [13; 14].

Conclusions

1. In patients with the consequences of surgical treatment of malignant tumors of the maxillofacial region, a pronounced decrease in multidomain indicators of quality of life according to the ONIR-14, EORTC QLQ-C30 and SF-36 questionnaires was established, which reflects limited possibilities for restoring physical, emotional and social functioning.

2. A comprehensive physical therapy program in patients with the consequences of surgical treatment of malignant tumors of the maxillofacial region is a tool for multidomain improvement of quality of life (according to ONIR-14, EORTC QLQ-C30 and SF-36).

3. The introduction of physical therapy programs into the clinical routes of postoperative management of patients with the consequences of surgical treatment of malignant tumors of the maxillofacial region is advisable to ensure multifactorial recovery.

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