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The influence of rehabilitation (kinesiotherapy) on the quality of life of cancer patients provided with palliative care

Abstract

Rehabilitation provision for the palliative patient is of great importance to the process of symptom treatment. It minimizes the complications and effects of the disease and optimizes, at least in the short term, the patients' level of physical condition and both psychological and social functions. The aim of this study was to evaluate the influence of rehabilitation on patients' quality of life in the terminal phases of cancer. The study involved 15 patients with advanced cancer and limited physical conditions. The Edmonton Functional Assessment Tool (EFAT) was used to measure the quality of life and control the symptoms. During the 28-day study significant improvement was observed in over 50% of the patients in the following: balance, mobility, activities of daily living and motivation, which are inseparable elements of improving the quality of life.

Key words: rehabilitation, quality of life

Introduction

The World Health Organization (WHO) identifies that palliative care offers a support system to help patients live as actively as possible until death [1]. In this context, rehabilitation becomes an essential component of palliative care. It is an approach to care that focuses on goal setting, re-enabling patients, and in helping them to adapt to their changed circumstances so that they may live fulfilling lives. Maximizing an individual's psychological and physical potential should be a realistic objective for all patients at all stages of their illness [2]. Fulton and Else explain that physiotherapy aims to optimize a patient's level of physical function and take into consideration the interplay between the physical,

psychological, social, and vocational domains of functions. The physiotherapist understands the patient's underlying pathological condition but this is not the focus of the treatment. The focus of physiotherapy intervention is, instead, the physical and functional sequelae of the disease and/or its treatment on the patient [3].

There is some evidence that rehabilitation improves the functional status of palliative care patients. Scialla et al. [4] demonstrated that elderly patients with cancer-related asthenia improved both physical and mental functions following inpatient rehabilitation. Montaginini et al. [5] assessed the utilization of physical therapy in a hospital-based palliative care unit. Physiotherapy benefited 56% of patients. Crevenna et al. [6] describe a 48-year-old

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female patient suffering from advanced breast cancer with metastatic bone disease who participated in an aerobic exercise program consisting of ergometric cycling. The patient experienced a marked improvement in physical performance and in quality of life. Mackey et al. [7] present a single case study of older women with cancer provided with palliative care, receiving physiotherapy in a palliative care setting. They conclude that physiotherapy interventions help to maximize the quality of life for patients.

There are also a few studies which present a implementation of a massage therapy programme in palliative care. The authors describe how massage appears to reduce levels of anxiety and improve physical and psychological symptoms, as well as overall quality of life [8–11]. Physiotherapy for the chest also called respiratory physiotherapy, is a very important part of the management of lung cancer patients. Hately et al describe highly significant improvements in patients' breathlessness, functional capacity, activity levels and distress levels. For example, the percentage of patients experiencing breathlessness several times or more per day was reduced from 73% to 27%. In addition, this project has demonstrated significant improvement in quality of life and high levels of patient satisfaction with the intervention [12].

The aim of our study was to evaluate rehabilitation on the quality of life of advanced cancer patients in palliative care. The study was based on the definition of Quality of Life (QL) as a perception of someone's life situation described by that person during a certain period of time [13].

The quality of life and functional status of the patients was measured using the EFAT. It assesses the status of 10 functions: communication, pain, mental status, dyspnoea, sitting or standing balance, mobility, walking or wheelchair locomotion, the activities of daily living, fatigue and motivation [14, 15].

Materials and methods

The Ethics Committee approved the clinical trial and eligible patients signed a written consent form to take part in the study. They were patients from the Priest Jerzy Popiełuszko Hospice in Bydgoszcz who were provided with home care. The patients were selected taking into consideration the inclusion criteria (advanced cancer, limited mobility, well-controlled pain, the ability to communicate logically with the person conducting the study) and exclusion criteria (scattered bone metastasis, intensified dyspnoea, acute circulatory failure).

Study design

The study lasted for 28 days. The first day a preliminary or baseline assessment of the patients was made, the inclusion and exclusion criteria were checked, the consents were obtained and the patients' functional status was measured using the Edmonton Functional Assessment Tool (EFAT). After 14 days another assessment was made paying special attention to any contraindications against continuing the test which might have been observed. On the last day of the trial a complete evaluation was conducted and the EFAT functional status was measured again.

Methodology

Rehabilitation was administered for 28 days twice a week. On the other days of the week the exercises were carried out by relatives, who were trained to do them correctly. Methods were selected taking into consideration patients' abilities and needs and included:

- Passive movements carried out by a physiotherapist without the patient's active cooperation; the rationale for passive movements is: maintaining and increasing the joint range of movement, preventing contractures, increasing circulation and facilitating both proprioceptive and exteroceptive feedback. The main goal is to change passive movements into active movements, if possible [16, 17].
- Active-passive exercises. Movement is provided by a physiotherapist whereas the patient's task is to relax muscles actively. Their aim is to disrupt the vicious pain circle. Pain causes strong afferent signals which go to the CNS, from where they return to the muscles. As a result muscular tone increases, limiting any active movement and causing joint pressure, thus increasing pain.
- Active exercises carried out by patients without a physiotherapist's assistance. The aim of these exercises is to maintain and increase the joint range of movement, augmenting muscle forces and improving neuromuscular coordination [16, 17].
- Active exercises with resistance. External resistance is selected according to current muscle force (therapist's hands, various weights). The goals of these exercises are: increasing muscle force, delaying processes which cause muscle weakness, improving neuromuscular coordination, and increasing afferent signals to stimulate motor cortex representation patterns [16].
- Isometric exercises. This is a type of strength training in which the joint angle and muscle length

do not change during contraction. Isometrics are carried out in static positions. They are very effective in muscle atrophy prevention and are useful when joint motion is painful or inadvisable. They are also used to increase muscle force, particularly when a limb is immobilized or when movement might cause bone or joint injury [16–18].

- Chest physiotherapy (chest PT) is used to prevent the accumulation of secretions, improve mobilization and drainage of secretions, promote relaxation to improve breathing patterns, improve the strength of respiratory muscles, and increase chest expansion. They also teach bronchial hygiene programmes to patients with chronic respiratory dysfunction in airway clearance [19–21].
- Exercises that lead to achieving the highest level of patient independence: these aims include a change of position in bed, moving from bed to wheelchair and back, getting dressed, eating and washing oneself.
- Standing up and gait re-education. Gait re-education for the long-term bed bound (especially in the older patients) commences with standing up in the correct position to help improve the circulation. In patients with serious musculoskeletal disorders or advanced cancer, gait re-education usually ends with simply achieving a sitting position.
- Exercises with a PNF pattern (Proprioceptive Neuromuscular Facilitation): PNF is a neurophysiological concept of treatment. The primary goal of exercises with the PNF pattern is to help patients achieve their highest level of function. The basis facilitation procedures provide tools for the therapist to help the patient gain efficient motor function and increased motor control. Their effectiveness does not depend on having the conscious cooperation of the patient. These basic procedures are used to:
 - increase the patient’s ability to move or remain stable;
 - guide motion by appropriate resistance and grip;
 - help the patient achieve coordinated motion through timing;
 - increase the patient’s stamina and avoid fatigue.

The PNF concept is based on neurophysiology and consists of multi-sensory stimulation (sensory, visual, verbal, proprioceptive stimuli). The PNF treatment approach is always positive, reinforcing and using that which the patient can do, on a physical and psychological level [22].

Table 1. Patients’ clinical data

Cancer type	Number of patients
Non-Hodgkin lymphoma	1
Breast	2
Lung	5
Stomach	1
Unknown primary	1
Colon	2
Uterine	1
Multiple myeloma	1
Prostate	1

- Equipment assessment: a physiotherapist considers patients’ needs and gives them assistance in selecting the most appropriate rehabilitation equipment, for example wheelchairs, crutches, walkers, rollators, canes and other necessary items.

The EFAT scale was used as an evaluation tool. It consists of ten items: communication, mental status, pain, dyspnoea, sitting and standing balance, mobility, walking and wheelchair locomotion, fatigue, motivation and activities of daily living (ADL). Each item in the EFAT is evaluated by a 4-point rating scale from 0 to 3 (0 = functional independent performance, 1 = minimal dysfunction, 2 = moderate dysfunction, 3 = total loss of functional performance). The total possible score on the EFAT scale is 30.

At the end of the EFAT a global performance status rating (PS) was presented taking into account the 10 functions assessed by the EFAT.

Results

The study involved 15 patients (10 women between the ages of 28 and 90, the median age being 75) receiving hospice care due to advanced cancer in a variety of different cancer sites (Tab. 1).

After 28 days of the study, during which physiotherapy was used, a significant improvement ($p < 0.05$) in balance, mobility, locomotion, motivation, ADL and performance status was observed. The details are presented in Tables 2 and 3.

Discussion

During the 28-day study, a functional status improvement was observed. A significant improvement — in over 50% of patients — was observed in the following functions: balance, mobility, ADL, motivation and performance status.

Table 2. The comparison of variability parameters of the studied performance status ratings in a group of advanced cancer patients

Measured parameter	Average	Median	Confidence Interval \pm 95%	Minimum	Maximum	p
PAIN_1	1.27	1	0.82–1.71	0	2	
PAIN_28	0.93	1	0.49–1.38	0	2	0.12
BALANCE_1	1.67	2	1.17–2.16	0	3	
BALANCE_28	0.87	1	0.41–1.33	0	3	0.02
MOBILITY_1	1.87	2	1.36–2.37	1	3	
MOBILITY_28	1.27	1	0.73–1.80	0	3	0.02
LOCOMOTION_1	2.0	2	1.41–2.59	0	3	
LOCOMOTION_28	1.47	1	0.81–2.12	0	3	0.04
FATIGUE_1	1.27	1	1.01–1.52	1	2	
FATIGUE_28	1.13	1	0.85–1.42	0	2	0.36
MOTIVATION_1	1.3	2	0.84–1.83	0	2	
MOTIVATION_28	0.13	0	–0.06–0.33	0	1	0.003
ADL_1	1.87	2	1.36–2.37	0	3	
ADL_28	1.3	2	0.79–1.87	0	3	0.01
PERFORMANCE STATUS_1	1.93	2	1.36–2.51	0	3	
PERFORMANCE STATUS_28	1.4	1	0.78–2.02	0	3	0.03

The Wilcoxon signed-rank test: 1 — parameter before the trial; 28 — parameter at the end of the trial; ADL — activities of daily living

Table 3. The percentage of patients who noticed an improvement

Measured parameter	% of patients reporting improvement	% of patients reporting no changes	% of patients reporting ailments intensification
PAIN	33%	60%	7%
BALANCE	53%	40%	7%
MOBILITY	60%	33%	7%
LOCOMOTION	47%	46%	7%
FATIGUE	20%	73%	7%
MOTIVATION	73%	27%	0%
ADL	53%	47%	0%
PERFORMANCE STATUS	53%	47%	7%

ADL — activities of daily living

The ability to maintain balance is extremely important in everyday life. The studied patients showed balance improvement by maintaining their sitting position for a longer period (with or without assistance) and moderating the use of medical equipment (crutches, walking frames, etc.). They were also more independent when changing body position. The balance improvement was crucial for patients, as they felt fitter and more independent in everyday life activities, and for reducing carers' involvement, which was also found to be significant.

Rehabilitation positively influenced patients' general mobility, enabling them to move more safely and independently.

Both balance improvement and better mobility, as well as motivation, influenced the improvement in ADL. The patients were more active and willing to talk to their relatives more often, watch television,

listen to the radio and read newspapers. They were more interested in doing minor housework (helping with preparing meals, ironing, etc.) and walking (with or without equipment). An ADL increase also showed itself in less sleepiness, apathy and tiredness and better concentration. Due to an increase in functional status, the patients' quality of life improved.

The quality of life improvement through increasing functional status probably influences the extension of an advanced cancer patient's life but it needs further observation.

A limitation of the study was the small number of patients, as it is difficult to find patients in the terminal phases of cancer who meet the inclusion and exclusion criteria and whose condition is stable for 28 days.

To evaluate the quality of life and control symptoms in patients with limited physical ability, the EFAT scale

was used. Karnofsky and ECOG (European Cooperative Oncology Group) scales are not very useful in patients with low physical ability, which is mostly the case in the advanced and terminal phases of cancer.

Despite the small number of patients completing the study some parameters (balance, mobility, motivation, ADL and performance status) proved to be statistically significant, which may lead to the conclusion that physical rehabilitation should be used as a therapeutic method in palliative care.

Conclusion

1. The use of rehabilitation in advanced cancer patients increased their functional status, which leads to their quality of life improvement.
2. The following parameters proved to be of statistical significance: balance, mobility, motivation, ADL and performance status.
3. The study showed that even if the improvement in advanced cancer patients' physical abilities is not a long-term one, it is worth using rehabilitation in symptom management.

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