

The Relation of Musculoskeletal Pain, Cancer Related Fatigue and Kinesiophobia in Oncological Patients

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Oncology is the part of medicine that studies neoplasms, benign and malignant tumors, emphasizing the latter, known by the name of cancer [1].

Analyzing the data present in the GLOBOCAN, currently the prevalence in cancer is almost three cases for every thousand inhabitants in the entire planet, being the second cause of death in the world; in 2008 it caused 7.6 million deaths (approximately 13% of the total) [2]. The ones that cause the most deaths each year are cancers of the lung, stomach, liver, colon and breast [3].

The improvement in terms of survival, as well as the increase in the incidence of tumor processes, makes it increasingly important the need to have a good symptomatic control of patients that ensures an optimal quality of life. Many of these patients, during the disease process, have multiple admissions. In these, we find that symptom control is optimal, but the problem arises at the time they are discharged. It has been observed that in this process, individuals find it difficult to normalize their daily lives, either due to a deterioration in their clinical state or due to a problem in the generalization of what they have learned during their hospital stay. Negatively impacting on their autonomy and consequently on their quality of life.

Common side effects of cancer or its treatment include tumor asthenia, pain, dyspnoea, cognitive difficulties, anxiety or depression, and changes in self-esteem or self-image [4]. To control these, an interdisciplinary intervention is required.

The professionals who would make up this interdisciplinary team of intervention in the cancer patient would be [5]:

- Occupational therapists.
- Nurses.
- Doctors.
- Physiotherapists.
- Psychologists.
- Auxiliaries.
- Radiologists.
- Social workers.

A fundamental part of it will be composed by occupational therapists, they address these effects through intervention aimed at restoring these functions.

The occupational therapist as a health professional will carry out his intervention in all those patients who present a specific symptomatology or characteristics that require it. In the case of the cancer patient, which we are talking about, their intervention will not be based on directly attacking the neoplasm to prevent its development or to eliminate it, but will stick to acting as a member of the

interdisciplinary work team, in charge of controlling the adjacent symptoms. To the oncological process, provide the necessary social support, both to patients and their caregivers, as well as to carry out actions that improve the quality of life of the individual.

The symptoms to which the occupational therapist will contribute to his improvement or adaptation of the cancer patient can be summarized in the following [5]:

- Cancer related fatigue.
- Respiratory pathologies as a consequence of oncological processes: Dyspnoea.
- Neurological pathologies as a consequence of oncological processes.
- Cognitive pathologies associated with oncological processes: “chemobrain”.
- Anxiety.
- Pain.
- Lymphedema.

All of them, without a correct action, will generate dependency in the individual and will promote a significant deterioration in their autonomy, with their consequent deterioration in terms of quality of life.

Therefore, the role of occupational therapy in oncology will be to “rehabilitate and re-adapt an individual, with the aim of achieving their greatest functional, physical or cognitive performance, in their activities of daily living, regardless of their life expectancy [6].

We will now analyze two of them, cancer related fatigue and pain, and their relationship with immobility and kinesiophobia, which considerably reduces the functionality and quality of life of cancer patients.

Cancer related fatigue

If we influence the term of tumor asthenia, that is, cancer related fatigue referred by oncological disease, we can find, in the 10th edition of the International Classification of Diseases (ICD-10), the following diagnostic criteria for cancer related fatigue [7].

ICD-10 criteria for cancer-related fatigue

- A. The following symptoms have been present every day or almost every day during the same two-week period in the last month:

Significant chronic fatigue, decreased energy, or increased need to lie down, out of proportion to any recent changes in activity level; in addition to five or more of the following:

1. Complaints of general weakness, heavy limbs.
2. Decreased concentration or attention.
3. Decreased motivation or interest in participating in regular activities.
4. Insomnia or hypersomnia.

5. Dream that does not refresh or restore.
 6. Perception that you need to fight to overcome inactivity.
 7. Marked emotional reactivity (for example, sadness, frustration, or irritability) in the face of chronic tiredness.
 8. The difficulty of carrying out daily tasks is attributed to the feeling of tiredness.
 9. Perception that there are problems with short-term memory.
 10. Tiredness after strenuous exercise lasts for several hours.
- B. The symptoms cause a clinically significant alteration, or weakness, or a deterioration in social, professional, or other important behavioral areas.
 - C. There is evidence from clinical history, physical examination, or laboratory findings that the symptoms arise as a result of the cancer or the treatment of this.
 - D. Symptoms do not arise primarily as a consequence of simultaneous psychiatric disorders, such as severe depression, somatization disorder, or delirium.

Cancer related fatigue is the most common symptom associated with cancer and its treatment. The estimated prevalence varies between 60 - 90%, depending on the diagnostic criteria used. Asthenia is considered the longest lasting and most disruptive symptom in cancer patients and has the greatest impact on quality of life parameters [8].

Etiopathogenesis

Etiopathogeny of tumoral astenia	
1.	Cytokine production.
2.	Muscle disorders
a.	Loss of muscle mass.
b.	Accumulation of lactic acid.
c.	Depletion of energy substances.
d.	Alteration in the distribution of muscle isoenzymes.
e.	Polyomyositis
3.	Neurological disorders.
a.	Reticular formation dysfunction.
b.	Paraneoplastic syndromes.
4.	Metabolic and endocrinological disorders.
a.	Mellitus diabetes.
b.	Hydroelectrolytic disorders.
c.	Hypothyroidism
d.	Suprarrenal insufficiency.
e.	Hypopituitarism.

5. Infections.
a. Viral.
b. Bacterial.
c. Fungal.
6. Anemia.
7. Specific treatments.
a. Chemotherapy.
b. Radiotherapy.
c. Biotherapy.
8. Symptomatic treatments.
a. Opioids.
b. Benzodiazepines.
c. Antiemetics.
d. Antihistamines.
e. Neuroleptics.
9. Overexertion.
10. Psychological disorders.
11. Comorbidity.
12. Tumor progression.
13. Asthenia after treatment.

Evaluation instruments

Most commonly used tumor asthenia evaluation instruments [9]:

- PERFORM questionnaire.
- Piper Fatigue Scale (PFS).
- Visual Analog Scale (EVA).
- Functional Assessment of Cancer Therapy-Fatigue (FACT-F).

Pain

The International Association for the study of Pain defines it as “an unpleasant sensory and emotional experience associated with a present or potential injury to the tissues” [10].

Pain is present in 30% of patients at the time of diagnosis and in 70 - 80% of patients in the final stages of the disease [11].

The tumors that report the highest incidence of pain are, in this order, bone tumors, cervix, head and neck, and stomach; being very rare in lymphomas or leukemias, so pain is not present in all people suffering from an oncological disease, as it is erroneously considered at a non-clinical level, in fact, the symptom with the highest incidence in patients is the tumor asthenia [12].

There are different types of cancer pain [13]:

- A. Acute pain:** With characteristics depending on the alarm signal, it is limited in time, has little psychopathological component and a large associated vegetative component.
- B. Chronic pain:** This loses its function of alarm signal of the acute phase, as well as its associated vegetative response. However, psychopathological components have an important influence. It is the most frequent in the cancer patient.
- C. Breakthrough pain:** It is the transient exacerbation of pain that appears on the basis of well-stabilized chronic baseline pain with analgesic treatment. It starts quickly and its duration varies.

It acquires the name of incidental pain if it occurs after a recognizable and preventable cause (example: sudden movement in patients with bone metastases). If it is not related to any cause, it is called spontaneous or idiopathic breakthrough pain.

Etiopathogenesis

The causes that can lead a person to report cancer pain are variable, and we can divide them into [14]:

- Pain caused by direct action of the tumor: infiltration or compression by lymphadenopathy or by metastasis of bone structures, nerve structures, etc. It is the most frequent.
- Pain caused by the administration of oncological treatments: surgeries (example: postoperative pain syndromes after mastectomy), radiotherapy or chemotherapy (example: polyneuropathies, cystitis, mucositis, etc.).
- Pain independent of pain and treatments: increased by oncological disease but due to another type of associated pathology.

Evaluation instruments

The most widely used cancer pain assessment instruments are [15]:

- Visual Analog Scale (EVA).
- The memorial Symptom Assessment Scale (MSAS).
- Affective subscale of the McGill questionnaire.
- Memorial Pain Assessment Card.
- Psychosocial Pain Inventory.

Kinesiophobia

Kinesiophobia, as its name suggests, refers to fear of movement or of performing a specific gesture that has recently caused specific pain [16].

The kinesiophobia is the fact that a person reduces activity when suffers damage itself is part of the physiology of the body. What happens when we suffer an injury? The first thing we feel is pain as a defense mechanism of our body since it alerts us that it is suffering. Nociceptors pick up the painful stimulus, send the signal to the spinal cord and brain where the stimulus is processed, and create a

protective response, such as withdrawal of the hand when in contact with very hot water or immobilization of sudden limb or stop of activity during a sprain, fibrillary rupture, or acute low back pain.

The normal thing is that when a person suffers damage, they avoid the damaging mechanism limiting their mobility, which is called immobility by avoidance. Furthermore, one of the consequences of pain is to stop activity and remain at rest as a protective physiological response. Rest time and immobilization are necessary for the inflammation to decrease and the tissue regeneration process to begin, which corresponds to the acute phase of the injury (first 48 hours). If the immobilization is prolonged for a long time, the tissues atrophy, muscle mass is lost and the risk of the lesion becoming chronic increases. Immobility by avoidance, in addition, causes maintained postures that entail rigidity and favor joint blockages. So, it is important to know how to identify a disorder of this type to avoid that the problem lasts longer than necessary.

The most widely used assessment instruments in kinesiophobia are [17]: The Tampa Scale for Kinesiophobia (TSK).

Interaction between tumor asthenia, pain and kinesiophobia

In daily clinical practice, we observe how advanced cancer patients present high levels of tumor asthenia, which in many cases translate into immobility. This immobility in many cases leads to the onset or exacerbation of pain in these patients, which inevitably joins a kinesiophobia by these.

This “cascade of events” will lead the patient to considerably decrease their functionality, and consequently their quality of life. In addition, this loss of functions will also affect your closest environment, since it will make you dependent, and you must have constant supervision by a primary caregiver. In this way there will be an important alteration in the roles of the individual.

We propose the possibility of initiating an intervention in these cases as early as possible from a rehabilitation perspective. Carried out by professionals of occupational therapy and physical therapy in a joint and interdisciplinary way, and thus be able to reverse or control the situation, improving on the one hand the levels of tumor asthenia, on the other, helping to control pain in order to decrease and power initiate a re-education in movement, eliminating the symptoms of kinesiophobia. In this way, we think we can improve the autonomy and consequently the quality of life of all these patients.

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