Amyotrophic Lateral Sclerosis: Exercise, Function and Overuse

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Short Communication

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ABSTRACT

Amyotrophic lateral sclerosis is a disease whose clinical characteristics leave the patient very physically exhausted. Engaging the motor neurons it rapidly evolves to limit movement, which clearly generates a very strong psychic trauma in the affected subject. Evolving with changes in speech and swallowing, until now there is at least the need for some health professionals to work in this case, the neurologist, the physiotherapist, the psychologist and the speech pathologist. The help of family and friends is critical for the patient, helping with his motivation and the treatment that can be done at home. The evolution of the patient is death with respiratory insufficiency and all health staff aims at palliative care in the final stages of the disease and give the greatest possible comfort to this patient. Of great clinical complexity and as far as the research the ALS shows to be different from case to case what increases its difficulty clinical accompaniment by the professionals and of research. Science still has much to research and learn from these patients to be better and offer better treatment conditions to patients.

INTRODUCTION

Amyotrophic lateral sclerosis (ALS) is a degenerative disease of adults affecting upper and lower motor neurons. In one to four years, progressive weakness, spasticity, and respiratory insufficiency compromise independence and survival. Large randomized clinical trials are needed to develop specific exercise guidelines. At present we do not know how much we can encourage motor neurons already compromised by the disease. Physiotherapists and Physicians believe that the exercises should be performed in submaximal limits, aiming not to overload the motor unit. Evidence suggests that moderate exercise is not associated with adverse outcomes in persons with “early-stage”. Moderate exercise programs can be safely adapted to abilities, interests, specific response to exercise, accessibility, and family support [1]. There is an urgent need for dissecting in detail the real risks or benefits of exercise in controlled clinical trials to demystify this ancient paradigm.

The embarrassing issue is the definition of the term “early|initial stage”, because when the first signs/symptoms of disease begin, patients have already lost about 80% of motor neurons in the affected regions. Functional scales are only useful for punctual characterization of the stages, which in clinical practice alternate rapidly. It is really difficult to define how much exercise may or may not be beneficial. Proper exercise is important for preventing atrophy of muscles from disuse-a key for remaining mobile for as long as possible-and as long as it is possible to exercise comfortably and safely, for preserving cardiovascular fitness. However, the typical neuromuscular patient features a great physical inactivity and disuse weakness, and for that reason many controversial authors have contested exercise in these patients during years, especially in ALS which is rapidly progressive [2].

Several human studies show that “moderate” exercise regimens improve ALS patients' scoring on functionality tests and ameliorate disease symptoms. Recent works using transgenic mouse models of ALS have shown slowed disease progression, “improved” function, and extension of survival in moderately exercised animals [3]. Explanations for these findings include the exercise-induced changes in motor neuron morphology, muscle-nerve interaction, glial activation, and altering levels of gene expression of anti-apoptotic proteins and neurotrophic factors in the active tissue [4]. Researchers compared the efficiency of a swimming-based training, a high-frequency and amplitude exercise that preferentially recruits the fast motor units, and of a moderate running-based training, that preferentially triggers the slow motor units, in an ALS mouse model. They concluded that the swimming-induced benefits sustained the motor function and increased the ALS mouse life span by about 25 days [4].

Evidence indicates disturbances in energy metabolism in patients with ALS and animal models of ALS, which are likely to contribute to disease progression. Particularly, defects in glucose metabolism and mitochondrial dysfunction limit the availability of ATP to CNS tissues and muscle. Metabolic approaches improving mitochondrial function have been investigated in vitro and in vivo and showed varying effects in ALS [5]. This is one of the factors that signals us to be more cautious in the execution of any physical activity that will further undermine this cellular signaling process, increasing catabolism and, consequently, accelerating the disease process.

Current pre-mortem diagnosis of neurodegenerative disorders such as ALS is based on clinical assessment of neurological deficits. However, symptoms and signs emerge only late in the disease course, thus indicating an urgent need for novel tools for detection of the underlying neuropathologyp [6]. Therapeutic exercises should be cautious and always respect the limits imposed by the disease and the functional limitations that emerge in this intriguing model, inducing the death of motor cells.

In conclusion, we consider that this clinical condition is extremely complex because of some factors such as: the clinical differences between one patient and another can be very large, which makes it difficult to create a pattern or use only one line of reasoning with these patients ; Many professionals are involved in the treatment of this patient so that it is effective and all staff must communicate constantly and must be very well intertwined what is difficult to occur many times, it is a patient who requires extreme care from diagnosis to the phase of paleatal care , Is a style of patient that the family fears to have at home because of the complexity of its accompaniment and if the family is not very united it can compromise much the quality of the treatment.

This short communication is like several studies on ALS, it has not or had the idea and cure all the problems that involve the disease, which in fact is impossible as large its complexity as previously highlighted. This can be understood as one of the limitations of this study. On the other hand, science needs studies like this to quickly point researchers to a direction research is taking toward that disease. Many clinicians in their fields are unable to read complex studies because of the demand for their jobs that spend much of their time during the day, so they prefer short studies like this to understand how surveys have followed.

CONCLUSION

Finally we observe that the therapeutic care should be with all the professionals involved and is a type of patient "on the wall", if you meditate the more he suffers with it and if you do not take medication, there is no result; In the same way if there is excessive work of physiotherapy or speech therapy this patient wears more and worsens his degenerative condition and if he is subtracted these approaches of rehabilitation do not advance of anything. It means that the dosage of medication and activity for these patients should be measured with extreme care and on a case-by-case basis to be effective.

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