



***Factibilidad de los ejercicios físicos terapéuticos para
rehabilitar niño con síndrome de Guillain- Barré
Feasibility of therapeutic physical exercises to rehabilitate a
child with Guillain- Barré syndrome***

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Resumen

La investigación aborda una temática de actualidad, relacionado con los ejercicios físicos terapéuticos para rehabilitar a un niño con síndrome de Guillain- Barré en San Antonio del Sur. Se evalúa su factibilidad empleando métodos del nivel teórico, empírico y estadístico matemático. Se aportan ejercicios terapéuticos para mejorar su salud, utilizando las actividades físicas y de rehabilitación a partir del grado de discapacidad que presenta el paciente para facilitar mayor independencia en las actividades de su vida cotidiana.

Palabras clave: Ejercicios físicos terapéuticos; Síndrome de Guillain- Barré; Rehabilitar; Discapacidad; Actividades físicas y de rehabilitación.

Summary

This research addresses a topical issue, related to therapeutic physical exercises. The problem is addressed: How to rehabilitate a child with Guillain-Barré syndrome in San Antonio del Sur? In this, the feasibility of the exercises to rehabilitate the child with this syndrome is evaluated, using methods: from the theoretical level, from the empirical level and from the mathematical statistical level. Therapeutic exercises are provided in the work to improve their health, using physical and rehabilitation activities, based on the degree of disability presented by the patient, to facilitate greater independence in the activities of their daily lives.

Keywords: Therapeutic physical exercises; Guillain- Barré syndrome; Rehabilitate; Disability; Physical and rehabilitation activities.

Introduction

Guillain-Barre syndrome is the most common cause of acute flaccid tetraparesis in Western countries. It affects both sexes and all ages, although it is rare in childhood. There are two age groups in which the frequency increases, the first in late adolescence and young adults and the second in old age.

Arroyo, Ganez and Miranda (2016), state that:

(...) Guillain-Barré syndrome is the most frequent cause of acute flaccid tetraparesis in Western countries. It affects both sexes and all ages, although it is rare in childhood. The frequency increases, the first in late adolescence and young adults and the second in old age (p. 4) in two age groups.

In this regard, Romero (2016), points out that.

(...) the exact trigger of the syndrome is unknown, what is known is that the immune system begins to attack the individual itself, producing an autoimmune reaction. It can appear after a viral infection (respiratory, gastrointestinal), previous surgery or trauma or as a reaction to a vaccine or together with viral infections such as: HIV, Herpes simplex". (pp. 129-203).

Typical symptoms are muscle weakness or loss of muscle function (paralysis). Weakness begins in the feet and legs and may progress upward to the arms and head. It may also begin in the arms and progress downward, or it may occur in the arms and legs at the same time. In some cases, it occurs only in the cranial nerves. It may worsen rapidly within 24 to 72 hours, although in mild cases, neither paralysis nor weakness may occur.

Lack of coordination; changes in sensation; numbness, decreased sensation; muscle tenderness or pain (may be similar to cramping pain); and vegetative disorders are typical symptoms.

Peydro, Baydal and Vivas (2015), state that "patients present greater or lesser alteration of balance, being their etiology different" (p.33). They highlight "the lack of balance due to the alteration of proprioception and muscle weakness caused by peripheral nerve damage". (p. 35).

In Cuba, the investigations carried out have determined that the archives and other written sources do not offer information on the existence of any attention in relation to physical rehabilitation, so there is no indication that reveals social or individual concern of some personalities or state

medical and sports institutions during the XV, XVI, XVII, XVIII and XIX centuries. This is understandable, if we take into account that medical care and sports institutions have always responded to class interests, therefore, it is a representation of the economic, political and social development that is evident in the economic base and superstructure.

In 1982, the country decided to start working on the development of programs and brochures in different medical specialties, including neurology, where Stroke Diseases were included. The content of the neurology program was based on the realization of exercises of easy execution, with the minimum use of large equipment and materials that included the treatment of neuronal disorders with motor deficiencies.

To this day, the use of programs continues with insufficient methodological orientations, which only respond to the general particularities of the pathology. In the classes, the use of traditional exercises is maintained with a predominance of basic gymnastics and a reduced use of INDER's indications in this regard.

According to Salmerón (2016), "in order to base the application of physiotherapeutic methods in the treatment of muscle tone alterations, it is necessary to know their neurophysiological bases." (p. 48).

In a normal situation, when a muscle is distended, the stretch receptors (neuromuscular spindles), located parallel to the other muscle fibers (extrafusal), are stimulated, which causes a transmission of the nerve impulse through the afferent fibers of the group since they contact in a monosynaptic way with the alpha motor neurons which, when discharged, cause muscle contraction. Other afferent fibers of the neuromuscular spindle are called group II and exert inhibitory effects on motor neurons.

Muscle tone is regulated by reticulo-spinal fibers that accompany the pyramidal pathway and have an inhibitory effect on the stretch reflex (myotatic), while the vestibulo-spinal-lateral pathway facilitates it.

In Guillain-Barre syndrome, peripheral nerves are damaged with the consequent alteration of the somatosensory systems and, as these are altered, posture, orientation and balance are also affected. Currently, there has been no in-depth research on the alterations in balance in this disease.

Treatments are focused on motor disorders. However, due to sensory and motor disturbances, balance disturbances are evident.

Nowadays, due to the imminent scientific-technological development, there is a demand for treatments that focus on motor disorders due to the evident existence of balance disorders, hence the research problem of how to rehabilitate a child with Guillain-Barré syndrome in the municipality of San Antonio del Sur.

In correspondence with the above mentioned, the objective of the research is focused on the evaluation of the feasibility in the elaboration of exercises to rehabilitate a child with Guillain-Barré syndrome in the municipality of San Antonio del Sur, Guantanamo province.

Development

The physical-therapeutic rehabilitation process in Guillain-Barré syndrome

Taking into account that education is the ideal link to transmit culture, it will be understood that in the field of instruction the main efforts should be oriented towards the deep investigation of the roots of advanced pedagogical thought. This information allows us to know the historical background of education based on the values, ideas and convictions of our identity.

According to Popov (1988), physical exercises for therapeutic purposes have been used since ancient times. The oldest engravings, in which topics related to the therapeutic action of movements and the use of massage are discussed, date back to 2,000-3,000 B.C.E., belonging to ancient China.

Defining the physical-therapeutic rehabilitation process has been the task of many scholars. One of them, Tamayo (2010,) concludes that:

(...)physical rehabilitation has been used in patients with brain injuries with the aim of favoring their recovery, without a well-founded background on the effect of this intervention, and the evolution of untreated patients. Today we have several studies that demonstrate the usefulness of physical exercise in neurorehabilitation as a modulator of the plastic process in the nervous system; and we are working on the design of more rational and adequate rehabilitation strategies according to the needs and characteristics of the patient. (p. 67).

Therapeutic physical exercise as the core of physical rehabilitation is important in the development of the human being, since it acts positively in all systems and organs of the body, but in the case of people with Guillain-Barré syndrome, it plays an essential role.

These are people who, in general, may have been bedridden for a long time, with a high degree of dependence, they do not walk, they present psychological problems as a consequence of their disability; but when they begin to perform physical exercises in a systematic way, directed by the rehabilitator, their quality of life improves in a short time, which is of help for their future recovery. This help stimulates them to continue working to incorporate themselves as

soon as possible to the activities of daily life; it also affects the occurrence of important changes in their organism and in their organ system that favor a better general condition.

Patients with Guillain-Barre syndrome, after an infection whose cause is unknown, come to the Therapeutic Areas of Physical Culture (ATCF), presenting a high rate of dependence.

The main objective of physical therapeutic rehabilitation is aimed at:

- Improve posture and range of motion.
- Increase muscle strengthening.
- Improve circulation.
- Achieve independence in activities of daily living for subsequent reintegration into society.
- Respiratory physiotherapy.

Sample characterization

In the initial observation of the case, we detected the limitations presented by the child with sequelae of Guillain-Barre syndrome, he could not stand or sit alone, he could not move around because he needed the permanent help of another person, so he had difficulties to maintain the correct posture. He was also unable to eat and dress himself adequately, due to the lack of strength in his hands, he did not respond to sensory stimuli in his feet and legs, showing loss of sensitivity and complete strength in them; all this made it impossible for him to carry out most of the activities of daily life.

The characterization of the child in the initial stage, allowed us to treat him from the disability, which is decisive in his rehabilitation treatment.

The interviewees, when answering the different questions, expressed that at the beginning, because of the pain, he did not cooperate with the treatment, so he felt bad and did not want to do the exercises, however, regarding the tasks to be performed at home are limited, since he is not able to solve the activities of daily living by himself, he presents clumsiness when manipulating the objects he holds in his hand and is afraid of dropping them. He cannot sit, stand or move around on his own, but needs the support of a person, even to perform exercises at home.

Basis of therapeutic physical exercises in the correction of different neuromuscular conditions

When referring to therapeutic physical exercises, Taylor (2007) considers them as a Physical Activity program that involves the patient in the task of performing a muscular contraction and/or

body movement with the aim of relieving symptoms, improving function or improving, maintaining or slowing down the deterioration of health.

In this same sense, Alcazar (2011), states:

Therapeutic physical exercise is the prescription of body movement with the aim of correcting, improving or maintaining a function, be it that of a specific muscle group or of the whole body. Any disease in the human organism is a factor that produces alterations or modifications in one way or another in all systems, because the human body functions as a whole. (p. 81).

The above definition is assumed, taking into account that its approach allows understanding that therapeutic physical exercise leads to correct, improve and maintain the functions, either of a specific muscle group or of the whole body.

This is why, in the authors' opinion, the use of physical exercise for therapeutic and health purposes, although it has been known since ancient times, only in recent years has its true physiological, preventive and curative repercussions begun to be better established.

Among the diseases that have benefited from the contributions of physical exercise are neurological diseases. This type of exercise is a means commonly used in specialized trauma and cardiovascular rehabilitation centers, and in recent years has been widely incorporated as a fundamental means in the rehabilitation of patients with neurological diseases or injuries that leave paralysis, motor disorders, disability, and others as sequelae.

The therapeutic physical exercises developed were organized with the following structure:

- Passive exercises
- Active exercises
- Resisted exercises
- Home exercises

Here lies the novelty of these exercises, since in this syndrome, there is damage to the peripheral nerves with the consequent alteration of the somatosensory systems and when these are altered, posture, orientation and balance are affected. At the present time, there has been no in-depth research on balance disorders in this disease. Treatments are focused on motor disorders, however, due to the sensory and motor alterations, the existence of balance disorders is evident, and this is where the proposed exercises come in to play their role.

Evaluation of the feasibility of therapeutic physical exercises for the rehabilitation of children with Guillain-Barré syndrome.

When analyzing the results obtained, we found that:

In order to evaluate the feasibility of the therapeutic physical exercises, interviews were conducted with four users: the physiotherapist, the pediatrician, the mother and a graduate in Physical Culture, the same offered suggestions, assessments and recommendations in relation to the proposal.

The level of experience of those involved in the rehabilitation treatment ranges from nine to 17 years, so they were considered competent to evaluate the proposal of the therapeutic physical exercises performed for the rehabilitation of the child with Guillain - Barré syndrome.

For this, the research assumes three dimensions, each one with its indicators:

In dimension number one, referred to the convenience of the therapeutic physical exercises for the rehabilitation of the child with Guillain- Barré syndrome, the four interviewees representing 100 % placed it on the scale of 5, very much in agreement.

In dimension number two, referring to the practical implications of the therapeutic physical exercises proposed for the rehabilitation of the child with Guillain-Barré syndrome, the four interviewees, representing 100%, placed it on the scale of 5, very much in agreement.

In dimension number three, referring to the methodological usefulness of the proposed therapeutic physical exercises, the four interviewees, representing 100%, placed it on the scale of 5, very much in agreement.

The aforementioned allows considering the therapeutic physical exercises for the rehabilitation of the child with Guillain-Barré syndrome to be implemented in social practice.

When interviewing the child's relatives, they allude to the progress made by their relative after undergoing the rehabilitation treatment using the therapeutic physical exercises proposal, mainly those performed at home.

First stage of treatment (December 2020 - April 2021)

In this first stage of treatment, the physiotherapist should meet with the child's relatives, explain his difficulties and how they can help him to overcome them, as his lower limbs remain stiff and without strength and sensitivity, so he cannot sit, stand or move alone, he needs the support of a person, even to perform the exercises at home.

In the beginning, the child felt weak when performing the exercises, with the massages it has been possible to tone the muscles of the lower limb, which remain quite stiff. The muscles of the lower limbs began to be stimulated.

From the supine decubitus position, his movements are very limited; when he stood up he was supported by the physiotherapist because he could not keep his balance, his posture was corrected, he moved with difficulty from home to the living room supported by the wheelchair.

The interested family members stimulated the child by exercising his hands with rubber balls so that he could regain his lost strength, and his legs in a self-assisted way, then they encouraged other appropriate activities, such as correcting his posture and helping in the relationship of therapeutic activities for the care of his person.

Second stage (May 2021 - October 2021)

In this second stage of the treatment, the muscles already had sensitivity through the heat, the different manipulations of the massage and the therapeutic physical exercises, toning the muscles of the lower extremity, so that the stiffness began to disappear, the performance of passive, active, resisted and other exercises for strengthening them. This resulted in the child asking to sit and stand up by himself, at first with help, until it was no longer necessary, maintaining his balance.

He began to move in parallel with support, and then without the help of any object, already with the correct posture and walking the room where the activities were performed, to perform the exercises at home he did not need the help of another person.

From the supine position, her movements are not limited; when she stands up she no longer needs the help of the physical therapist, her movement is wide, and she goes up and down the stairs and runs around the room.

The family members are grateful for the progress the child has made, they continue at home exercising his hands with rubber balls and other objects, he now eats, dresses, bathes himself, without dropping objects, he has regained the strength he had lost. He is already playing with his friends in the neighborhood and joining the activities of daily life.

Results of the pre-experiment

As part of the pre-experiment developed to test the level of feasibility of the elaborated therapeutic physical exercises, several procedures were organized, aimed at:

- Sample selection
A 5-year-old boy diagnosed with Guillain-Barré syndrome, which left him with paralysis in the lower limbs and little strength in the upper limbs.

- Classification of the type of pre-experiment (pre-experiment pre-test and post-test with only one experimental group.
- Application of therapeutic physical exercises.

After applying the passive exercises, he had his first leg movements and improved his posture. Once the resisted exercises were performed, the weak muscles began to be strengthened and balance and muscle power were restored, and he took his first steps with help and could stand on his own. Once these were finished, the active ones were started, which he could do alone, walk and hold objects with his hands.

- Comparison of the results

Evaluating the two stages, it is observed that there was a remarkable progress between the first stage, where the child had no movements in the lower limbs and little strength in his hands, so everything fell, thus not being thus after the application of the therapeutic physical exercises where he already walks, can take different objects and perform other functions such as bathing, dressing, eating alone among other activities.

It is necessary to emphasize that, in spite of the difficulties in the child's development due to his disability, the results obtained after applying the treatment are satisfactory, and a general recovery is observed. We give thanks, highlighting the help of the family (mother) who was there during the treatment. This corroborates the high degree of feasibility of the therapeutic physical exercises elaborated in the research.

Conclusions

The historical tendential antecedents in the physical therapeutic rehabilitation process in Cuba were determined, whose analysis showed the need to deepen, through the scientific activity and the current demands. The characterization of the assumed theoretical referents confirms the need for a personalized approach of the rehabilitation treatment in correspondence with the characteristics of each patient, allowing basing the research problem. By means of the diagnosis, the existence of motor difficulties and dependence of the child under study is corroborated, which merited a personalized intervention through therapeutic physical exercise. The physical therapeutic exercises for the physical rehabilitation of the child with Guillain-Barré syndrome showed the systemic methodological aspects for the treatment of this pathology, guaranteeing the child's motor independence. The results obtained, when evaluating the evolution of the child with

Guillain Barré syndrome, corroborate the feasibility of the therapeutic physical exercises elaborated for the treatment of this syndrome.

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