PHYSICAL REHABILITATION OF CHILDREN WITH FALCIFORM ANEMIA. GENERAL CONSIDERATIONS (review)

La rehabilitación física de niños con anemia falciforme. Consideraciones generales

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ASBTRACT

This paper the general methodological theorical consideration of children with sickle cell anemia, and the prospect for his physiotherapy treatment which specify a multifactorial process from the current position and concepts onhow to maked the lives of children wiht this condition, as pleasant os posible. Review important concepts that change some traditionalist approaches to treatment and vision of the lifestyle of these children, emphasizing the change of activity of an almost warren of physical activity in their state are taken up to a much more open, informed and accessiblephysical activity as a form of rehabilitation and transformation mechanism that enables a new life expectancy in children in this study.

Key words: Physical rehabilitation, sickle cell anemia, Physiotherapy treatment, new life

RESUMEN

El presente trabajo refiere las consideraciones teórico- metodológicas generales de la rehabilitación física de niños con anemia falciforme, y las perspectivas de su tratamiento fisioterapéutico que concretan un proceso multifactorial desde los posicionamientos y conceptos más actuales en el cómo hacer la vida de los niños con este padecimiento, lo más satisfactoria posible. Se retoman conceptos importantes que cambian algunos enfoques tradicionalistas en el tratamiento y visión del estilo de

vida de estos niños, haciendo énfasis en el cambio de actividad de un estado casi vedado para la actividad física en ellos a uno mucho más abierto, fundamentado y accesible de la actividad física como forma de rehabilitación y mecanismo de transformación que hace posible una nueva expectativa de vida en los niños del presente estudio.

Palabras claves: Rehabilitación física, anemia falciforme, tratamiento fisioterapéutico, estilo de vida

INTRODUCTION

Before deepening the criterion on the physical rehabilitation of children with sickle cell anemia (cikclemia) it is opportune to define the concept of rehabilitation by the context in which this research is framed. According to reports, rehabilitation is a word of the twentieth century.

At first it meant restoration, then became synonymous with good medicine, etymologically rehabilitation means repairing or restoring a condition. As Restrepo, A. (1995) refers, the root of the word is to enable, a term derived from Latin that can be translated as "to qualify", "to prepare for", or "to endow skill".

For Popov, S.N. (1988), rehabilitation defines it as "the process of recovering the health and working capacity of the sick. During rehabilitation, the aim is to achieve, with the help of the various means, the maximum physical, professional, social and economic fitness of man. The therapeutic physical culture aimed at the recovery of the functional possibilities, occupies among these means, a prominent place". According to Junco, N. (1989), concrete rehabilitation as "the use of all methods that allow the complete healing of the patient, their preparation for work and their place in society. These methods can be: medicinal, psychological, physiotherapeutic, labor-therapy, sociological, therapeutic physical culture and natural factors ".

The United Nations considers rehabilitation to be "a global and continuous process of limited duration and with defined objectives aimed at enabling a person with a disability to reach an optimal physical, mental and social level, giving the person Tools necessary to achieve a level of independence and freedom important to lead their lives. "

It is also assumed the concept given by Popov, S. N. (1988) for considering Therapeutic Physical Culture as one of the most important means to recover the

health and work capacity of patients, aspects that can be appreciated in children with sickle cell disease.

In order to balance the above, it is considered opportune to cite some theoretical and methodological foundations that support the process of physical rehabilitation in children with sickle cell anemia from physical exercise and the physiological perspective.

DEVELOPMENT.

From the physiological point of view, when a person does physical exercise, one of the most noticeable effects with the naked eye is the reddening of the skin, and although the temperature has a great responsibility in this process of coloration, it is evident that its fundamental physiological cause Is the blood circulation, so when doing physical exercise one of the components of our body that is impacted in this process is precisely the blood.

Therefore, the effect of physical exercise on the blood and therefore on the so-called formal elements is remarkable, some studies such as Gython-Hall (1999) refer (in the systematization of this knowledge) that physical exercise Modify hematological structures such as leukocytes, erythrocytes (red blood cells) and platelets, as well as hematopoietic factors such as density, viscosity and blood coagulation.

In the particular case of children with sickle cell anemia, deformed red blood cells are present, which involves a very limited amount of nutrients and oxygen, so the formation of red blood cells to guarantee such transport is crucial. Also, it is significant to note that hemoglobin transported is a defective hemoglobin, which leads to avoiding strenuous physical exercise in this disease, or what is the same the states of sustained hypoxia.

Two important reasons for this are that hypoxia states induce hemolysis (rupture of the red blood cell) due to the weakness of the membrane, which is exacerbated by hemoglobin in the form of a sickle, which damages the membrane due to its excessive production in response To supply the deficiency of oxygen and nutrients. The other reason is related to the density of blood, which in sickle cell anemia as it is the case, its state is too dilute, which conditions an increase in cardiac output by also supplying nutrient and tissue oxygen deficit.

The hematopoietic process

On the other hand, erythropoietin is key in the process of formation of red blood cells, so erythropoietic stimulation under all circumstances is a favorable element to contribute to the physiological condition of the blood in general. Erythropoietin is basically released by the bone marrow and kidneys (although the exact site is unknown) in the case of the kidneys as proposed by Gython-Hall, stress hormones (adrenaline and noradrenaline) influence the stimulation For the release of erythropoietin, thus one of the ways to stimulate such release in this child, may be directed to the neuroendocrine stimulation of the excitatory and inhibitory processes.

In concretion of the ideas put forward in what has been referred to here, they can appear as fundamental ways in the systematization of the knowledge of the physiology of the blood and the physical exercise, two fundamental questions; The first: physical exercises in a zone of moderate work power in which an optimal breathing process is favored, and the second: physical exercises that influence the neuroendocrin activity to favor the stimulation of the erythropoietic processes that influence In turn in the formation of red blood cells, this cascade effect undoubtedly places in favorable conditions the children affected with this type of anemia.

On the other hand, it is significant to emphasize the cardiovascular and respiratory system in these children. The first is composed of the heart, blood vessels (arteries, capillaries and veins) and blood circulating inside the vessels. Indeed, Smith, C. (1985) in his Pediatric Hematology reflects that the heart is enlarged, even at the beginning of childhood, reflecting an increase in cardiac output necessary to compensate for severe chronic anemia.

In the respiratory system

In the respiratory system, pulmonary function is significantly altered in sickle cell anemia, evidencing reductions in vital and total lung capacity. Another important finding is the decrease in (PaO2) and arterial oxygen saturation, even in younger children. There are also episodes of pulmonary infarcts that exacerbate respiratory failure.

Indeed, these respiratory insufficiencies that characterize the child with sickle cell anemia can be improved through systematic physical exercise. In this last aspect, Gython-Hall (1999) reports that physical exercise causes a series of adaptations in the cardiovascular system, which undoubtedly contribute to increase the physiological efficiency of the same.

Among the main adaptations is the increase in pulmonary volumes and capacities, especially the so-called vital lung capacity (amount of air that the individual can expel after deep inspiration), respiratory rate (number of times the individual takes and Expels the air in a minute), as well as the opening of a larger number of pulmonary alveoli to achieve a more efficient gas exchange during the time that lasts the muscular activity, fundamental in the child with cikclemia.

Physiological adaptations

It is possible to express that the different physiological adaptations in the cardiovascular and respiratory systems are vital adjustments for a process of physical and integral rehabilitation in the child with sickle cell anemia who undergoes the systematic practice of physical exercise.

It is assumed the criteria of Bermúdez, R. (1987) related to the changes that are observed in the blood, under the influence of physical exercise, in this sense, it is possible to emphasize the increase in the number of erythrocytes and that of the hemoglobin concentration, This increase indicated by erythrocytes is due to three basic mechanisms.

• Redistribution of blood in the circulatory system from reflexive and humoral influences, highlighting the role of adrenaline as a vasoconstricting agent that allows the diversion of blood from the capillaries of internal organs to muscle vessels, a phenomenon known as compensatory vasoconstriction .

• Increase in the amount of blood that circulates due to the reflex influences of the blood in the reservoirs (spleen, liver and subcutaneous vessels) into the bloodstream, which increases the number of red blood cells to 20 %, Because of the higher concentration of these cells in the blood reservoir.

• Elaboration of new erythrocytes during muscle work, red blood cells are regenerated, prevailing considerably on the processes of destruction, whereby a number of young forms of erythrocytes called reticulocytes are observed, which are more resistant and seden more easily oxygen To tissues than erythrocytes.

CONCLUSIONS

1. Despite the serious consequences of sickle-cell disease and the costly nature of its conventional treatment and transplantation, there is at least one effective, efficient and effective medium based on physical exercise therapy and play, which under its Action

increases blood flow to the cells, tissues and organs of the body of children suffering from this chronic disease.

2. The different physiological adaptations in the cardiovascular and respiratory systems are vital adjustments to guide a process of physical and integral rehabilitation in the child with sickle cell anemia who undergoes the systematic practice of physical exercise.

3. The changes that are observed in the blood under the influence of physical exercise, contribute to the increase of the number of erythrocytes and that of the hemoglobin concentration, due to three basic mechanisms determining for an acceptable physiological condition in these children with the disease.

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