GENERAL CONSIDERATIONS ON THE USE OF PHYSICAL EXERCISE IN CORRECTION OF LORDOS

Buţu Ioana Maria, Sidenco Luminiţa Elena, Teodorescu Simona Anemari, Cătună George Cristian

Faculty of Physical Education, Sport and Physical Therapy, University Spiru Haret, Berceni Road, no. 24, Bucharest

Abstract

Introduction

In contemporary society, more and more people face postural problems as a direct consequence of their sedentary lifestyle and long hours at the office. The lack of time causes more and more people to use the car for travel, spend less and less time doing sports or walking and pay less attention to physical shape. Hyperlordosis is a sagittal deviation, in which the natural curves of the spine (normal lordosis) are accentuated posteriorly, leading to a distortion of the posture. Lombar lordosis is of major importance in maintaining sagittal balance.

Material and methods: In the study we used research ascertaining.

Results: The proposed exercise program is effective because it requires groups of muscles involved in the development of lordosis and allows the adoption of a correct posture, which can then be strengthened. Working with the ball and the rope adds extra variety and is more exciting for patients, but it also allows maximizing the benefits of exercise by activating multiple muscle groups at the same time.

Discussion: The proposed exercises have a low degree of difficulty and can be performed by most people suffering from lordosis. Exercises do not require expensive equipment and can be done in smaller spaces.

As will be noticed, in the absence of continuity, an exercise program can not prevent reinstallation of lordosis after a while. Therefore, the sets of exercises proposed can be easily continued after the treatment period itself.

Key words: physical exercise, vertebral deficiency.

Introduction

As explained in the literature, "in terms of exaggeration or diminishing the amplitude of physiological curves, the boundaries between normal and pathological are wide due to individual variations" [1]. However, in the case of a hyperlordosis, abdominal prominence and other abnormalities such as tilting of the head and neck to compensate for the cervical curvature, horizontal pelvis, or knee leg stretching (Figure 1) are observed. In many cases, hyperlordosis is associated with increased cynicosis, but few cases of reduced figuration have been observed.

Certainly, studies demonstrate the effectiveness of medical gymnastics in relieving pain and correcting posture. Forming a program of exercises to correct lordosis is one of the most important tasks of the physical therapist in treating this condition. In determining the set of exercises to be applied, consideration should be given to the physical form and health of each patient. Individualisation of treatment is imperative, because otherwise the treatment may be ineffective and even more, it could cause health problems for the patient.

The assessment of physical shape and health before setting up the exercise program is all the more important as certain illnesses may arise due to the rise of the lordotic curve, namely myopathies by facial muscular injury, premature arthrosis or intense pain, among others. Medical gynecological treatments aim to correct the lumbar spine and involve the

strengthening of the abdominal muscles, the back and the buttocks.

It also attempts to correct posture and change the lifestyle of the patient by encouraging physical activities, swimming or cycling, according to their preferences and possibilities. Performing exercises brings multiple benefits to patients by weight loss, adopting a healthy lifestyle and improving or curing the illnesses themselves.

The increasing incidence of lordosis even among children and the growing awareness among the population of the possibilities of recovery provided by the means of gymnastics makes this area a high interest at the moment. The need to help patients recover a correct posture is all the greater as the expectations of ordinary people have grown and they want a higher quality of life.

Material and methods: through this work we aim to justify the use of medical gymnastics for the healing of lordosis by presenting a program of exercises addressed to adults who suffer from postural lumbar lordosis as a result of a lifestyle and unhealthy habits whose affection is not aggravated of other associated diseases. This study aims to demonstrate the effectiveness of kinetotherapy in treating postural problems, as well as changing the patient's mentality, in order to avoid a return to the same habits.

The vertebral column has certain characteristics and follicularities that need to be known to understand its importance within the locomotor apparatus. It extends from the skull to the coccyx and measures 73 cm approximately in male and 63 cm in female, accounting for 40% of the body surface [2]. As Avramescu pointed out in his paper, in the topographic plane, the spine can be divided into several sections, namely: the cervical column, the thoracic column, the lumbar column, the sacral column.

The backbone is not rectilinear but has 4 curves in the sagittal plane [2]. Curves have evolved as a result of bipedism. Depending on the way convexity is oriented forward or backward, a distinction can be made between lordosis and cifos [3]. These are:

• Cervical curvature (lordosis), which has convexity before, is found between vertebrae C1 and T2.

• Chest, or dorsal curvature (chest). It has convexity back and lies between vertebrae T1 and T12, and is therefore the longest curvature of the body.

• The lumbar curvature (lordosis) has anteriorly directed convexity, being located between vertebrae L1 and L5.

• Sacro-coccygian curvature (figurative) [2].

The transition from one curve to another is gradual. Also, [1] explained that "by overlapping exposure of these curves, the spine acts like a spring, these physiological curves providing elasticity, balance and resistance."

In other words, these sagittal curves are essential in all column functions. They amortize the forces that put pressure on the column and help maintain the normal posture of the body. Column curves develop postnatally in the early years of life. In the fetus, the developing column has only a curvature, that is, the cilia.

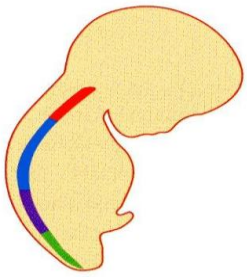

Figure no. 1. Image of the spine during intrauterine development
https://www.studyblue.com/notes/note/n/anat-phys-test-2-david-patton/deck/6790186

The development of the curves occurs from birth, when the newborn has a lumbosacral angle separating two cysts, the cervico-thoracal that has developed during the intrauterine life, and the sacrococigian one.

The term lordosis refers to the normal lordotic curvature in the lumbar and cervical regions. Lumbar lordage plays an essential role in maintaining balance, while providing elasticity and mitigating vertical shocks. In this regard, some authors assert that lumbar lordosis is the most important spine curve because it supports the weight of the trunk and pelvis [4]. Lumbar lordosis differs as a degree of accentuation depending on age, sex and physical activity.

Researchers' views on the depth to which lordosis is normal differ. The Scolio Research Society proposed a normal variation between 40 and 60o, measured in adults between the T12 and S1 vertebrae. However, other researchers measured the normal curvature of the column in other ways, with different results. These different results show only that each person has its own physiognomy of the column, and these mean values are only indicative [5].

The ideal posture is hard to determine. For example, in his work, [6] showed that, although considered controversial, his method of assessing the ideal posture presupposes the balance of sagittal curves and positioning of the joints so that the line of gravity of the body is located in the median plane and descends face of thoracic vertebrae, anterior or vertebra S2.

Early correction of lordosis is the most appropriate method of addressing the problem, as the chances of the posture being recovered are greater in this case. There are several types of treatment, depending on the problem gavity and associated conditions. Thus, lordosis is corrected by means of physical exercise, balneotherapy, the bodice, and, ultimately, the surgical procedure [7]. However, surgical treatment is reserved for serious, progressive deformities. In this respect, [8] stated that: "In the case of minor curves, radiological follow-up is sufficient. Surgical treatment is recommended for progressive cases with radiological monitoring, severe curves, and important deformities of the spine and trunk, as well as those who develop neurological syndromes due to vertebral anomalies."

Exercise is first and foremost a good preventative treatment for the affections of the spine, and it is recommended to all people, regardless of age. The degree of difficulty depends primarily on health, but many factors have to be taken into account, such as age and physical form. Exercise strengthens muscles and helps maintain a healthy lifestyle, but has many other health benefits. If lordosis is installed, the bodice is sometimes required for a defined time period to correct the posture. Bathrooms and swimming are sometimes recommended for the same purposes in physical therapy, and the means of physiotherapy, such as sludge and paraffin packaging or electrotherapy, are also used today quite often to improve the physical condition of the suffering person.

Medication may also be needed when the person affected by lordosis experiences pain. Medicines generally have the role of relieving pain and inflammation and are being administered in various other conditions associated with hyperlordosis, or which can lead to the onset of normal lordosis.

Physical therapy aims to correct the deformation of the spine by movement, and treatment can last for a long time. As a result of such therapy, the patient will not only have a much better posture but also an improved lifestyle if good habits are maintained during therapy. The role of the therapist is not only to help the patient gain more strength, flexibility and mobility but also to teach the patient how to perform certain movements at home [7]. Postural exercises may include several parts of the body, including the hips, pelvis, legs and feet.

For children, treatment may take several years, and the patient will be followed throughout the growing period. Often, lordosis associates with the figure, giving birth to the cipher, especially in the case of

the elderly. In this case, "the basic principle of corrective gymnastics consists in tonifying and shortening the muscles on the convexity of the column curvature" [9]. However, in the case of the elderly, the treatment objectives may be others, such as reducing the deformity of the column, or improving the quality of life.

Regardless of the purpose and duration of the treatment, the first step in its establishment is to inform and inform the patient of the mistakes that led to the deformation of the spine when it has occurred as a result of an incorrect lifestyle. The treatment steps consist of establishing the exercise program, its strict follow-up both in the scheduled sessions, along with the therapist and on its own, and finally, consolidating the results obtained by hiring patients with correct posts, and incorporating them in the style of life.

Results: Specialty literature includes a variety of motion-based programs, which have the role of correcting lumbar lordosis performed by both Romanian and foreign researchers. The results show that physical exercise can be extremely useful in correcting posture, especially when these are not caused by other conditions, are not congenital, and are at an early stage.

Different sport disciplines have contributed to the development of understanding how the movement contributes to the restoration of posture in the case of hierarchy. In his study, [10], for example, showed that physical bodybuilding exercises address different groups of muscles in segments, so they are very effective in combating various physical deficiencies. [10] proposed a program that includes static exercises in seated, lying, kneeling and hanging positions as well as dynamic, including trunk and limb exercises.

In terms of gymnastics, a study [9] on strict abdominal exercises, proposes a program aimed at correcting cicholorrhosis, a frequent disorder that often starts with hyperclothic posture, and over time it leads to exaggeration of cifosis, to rebalancing column. The advances proposed by [9] are less well known in the literature and aim to "tone and shorten the muscles on the convexity of the column curvature", using in this respect movements that simultaneously address both curves, the lordotic and the cifotic one. The exercises proposed by the author refer to the positions sitting, sitting and lying down, and offer a rich set of movements designed to strengthen the muscles of the abdomen. International studies that have tried to demonstrate the effectiveness of gymnastics methods in treating lumbar lordosis have been a great success. For example, [11] conducted a study on the effect of exercise in correcting the lumbosacral angle in young men. They selected 30 students with strong lordosis and applied a physical exercise protocol with half of them. The others were the control group. After 8 weeks of 3 exercise sessions, the researchers noticed a significant reduction in the angle of the lordosis. This study highlighted the role of exercise in the treatment of hyperlordosis.

Another similar study was conducted [12], about the deformities of the column in general. The study was conducted on a sample of 150 pupils over the course of 8 weeks. In this case, the researchers found that exercise is a safe and effective method of treatment [12].

However, it should be noted that although effective, medical gymnastics is not always a permanent solution to postural problems. In this regard, [4] led an experiment involving 32 students with hyperlordosis. Researchers evaluated the results of 8 weeks of corrective exercises as positive, meaning that they improved the attendance of the participants. However, after four months in which they returned to their usual lifestyle, it was found that the angle of the Lorotic curve began to rise again [4]. This demonstrates the importance of consolidating and continuing an active lifestyle after the end

of the treatment period. In the absence of continuity, lordosis may reappear.

The present study aims to evaluate the effectiveness and benefits of using gymnastics methods to correct lordosis in the general population. The proposed exercise program is meant to present a low degree of difficulty so that it can be done by different patients. At the same time, this program requires groups of abdominal muscles that are unlikely to be cured and are intended to correct the shape of the spine. The study consists of 2 sets of exercises using rhythmic gymnastics specific work tools, namely the ball for rhythmic gymnastics and the rope [13].

Set of rhythmic gymnastic ball exercises

1. Initial Position: Sitting with arms up, the ball held with both hands

1 - Easy bending of legs simultaneously with lowering of arms forward

2 - Extend the legs simultaneously with the arms up.

2. Initial Position: Holding the arms up, holding the ball with both hands

1 - Lowering the arms forward simultaneously with raising the right foot forward

2 - Return

3-Lowering the arms forward simultaneously with raising the left foot forward

4 - Return.

3. Initial Position: Standing far away, the ball is held at the back with both hands

1 - Tacking the trunk forward

2 - Extend the arms up

3 - Bending your arms with your hands on your neck

4 - Return.

4. Initial Position: Sitting with arms up, holding the ball with both hands

1 - Pretend with your right foot, with the arms folded, the ball to the chest with both hands

2 - Return

3 - Pretend with your left foot, with the arms folded, the ball to the chest with both hands

4 - Return.

5. Initial position: On the knee, arms up, the ball held with both hands

1-2. Bending the trunk forward

3-4. Return.

Set of rope drills

1. Initial Position: Standing with the arms up, the rope held in two with both hands

1 - Lowering your arms forward

2 - Raise to peaks simultaneously, raising the arms up

3 - Lowering the arms forward, returning to the entire sole

4 - Raise arms up.

2. Initial position: Standing away, arms up, the rope held in two with both hands

1 - Raise the right leg forward simultaneously with lowering the arms forward

2 - Return

3 - Raise the left leg forward simultaneously with lowering the arms forward

4 - Return.

3. Initial Position: Standing away, arms up, the rope held in two with both hands

1 - Tacking the trunk forward

2 - Twisting the trunk to the right

3 - Twisting the trunk to the left

4 - Return.

4. Initial position: Standing away, arms up, with the two-handed rope held

1 - Bending the torso forward, bending the arms, holding the two-handed rope with both hands at the shoulder blades

2 - Return

3 - Folding the torso forward with the arms bent, the two-handed rope with both hands on the shoulder blades

4 - Return.

5. Initial position: Seated, arms up with the rope held in 4

1-2. Lowering the arms simultaneously with passing the right foot over the string

3-4. Return to original position

5-6. We're walking with our left foot

7-8. Return to original position [13].

Discussion and conclusions

The exercise program proposed above is effective because it requires the muscles that are involved in the development of lordosis, and allows the adoption of a correct posture that can then be strengthened. Working with the ball and the rope adds extra variety and is more exciting for patients, but it also allows maximizing the benefits of exercise by activating multiple muscle groups at the same time.

The proposed exercises have a low degree of difficulty and can be performed by most people suffering from lordosis. Exercises do not require expensive equipment and can be done in smaller spaces.

Although not difficult, great emphasis is put on the correct exercise, as, in addition to training weak muscle groups, these exercises are designed to help patients regain a normal posture by insisting on awareness and re-education of patients in order to obtain of long-term results.

As shown above, in the absence of continuity, an exercise program can not prevent reinstallation of lordosis after a while. Therefore, the sets of exercises proposed can be easily continued after the treatment period itself.

Although the deformities of the column are very common in the current society, there is still a strong inhibition when it comes to this issue, because people with deformities of the column are still subject to social exclusion and ridicule.

References

[1]. Manafu, C. et al. Unstructured deviations of vertebral column. The Medical Journal of Sibiu 18 (3): 36-40.

[2]. Papilian, V. (2003). Human anatomy: locomotor apparatus, vol. 1, edition 11. Timişoara: Bic All.

[3]. Avramescu, E.T. (2015). Anatomical Basics of the Movement: Practical Course for Students of Physiotherapy Faculties.

[4]. Golsefidi, Neda Rezvanhah, Alizadeh, Mohammed şi Kordi, Mohammed Reza. The Effect of Four Months of Detraining Following Eight Months of Corrective Exercises on Lumbar Lordosis of Schoolgirls. Annals of Applied Sport Science 1.2 (2013):19-23.

[5]. Schlenzka, D. & Arlet, V. (2008). Juvenile Khyphosis (Scheuermann's Disease). Spinal disorders: fundamentals of diagnosis and treatment. Springer-Verlag Berlin.

[6]. Clippinger, K. (2007). Dance anatomy and kinesiology, Human Kinectics, New York.

[7]. Moini, J. (2013). Introduction to pathology for the physical therapist assistant. Burlington, MA: Jones & Bartlett.

[8]. Niculescu, M & amp; Moldoveanu, M. (2014). Orthopedics and traumatology for nurses. Bucharest: All Publishing House.

[9]. Diaconu, A. (2001). The therapeutic applications of abdominal exercise. Annals of "Stefan cel Mare" University. 162-169.

[10]. Neferu, F. Applications of bodybuilding means for the prevention and correction of vertebral deficiencies. Studia Universitatis "Vasile Goldis" 4 (1): 36-42.

[11]. Daneshmandi, H., Sardar, M. & Taghizadeh, M. (2005). The effect of exercises program on lumbar lordosis, Research on Sport Science 3 (8): 91-103.

[12]. Rahnama, N. & al. (2010). The effect of 8 weeks regular corrective exercise on spinal columns deformities in girl students. Journal of Isfahan Medical School 27(101): 1-11.

[13]. Buţu I.M. (2015). Rhythmic gymnastics - general bases. Bucharest: The Romanian Tomorrow Publishing House.

[14].https://www.studyblue.com/notes/note/n/anat-phys-test-2-david-patton/deck/6790186