INTERDISCIPLINARY COOPERATION IN DEALING WITH SPINAL DISEASES

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Summary

Introduction: Spinal diseases include a large number of functional and degenerative spinal diseases whose common symptom is pain. They represent an interdisciplinary issue in which a wide range of medical disciplines are involved in diagnostics and therapy. Through a multidisciplinary approach, we will achieve the effect of therapy in a much shorter time, which will positively impact several aspects of a patient's everyday life.

Material and Methods: Many studies suggest that nearly 80% of all adults experience back pain during their lifetime. An important role in rehabilitation is played by intervention during one's childhood that focuses on body posture disorders and the disorders related to the musculoskeletal system, leading to the area of primary prevention (Gúth, 2003). We investigated how correct posture and suitable exercise affect spinal deformities. A survey sample consisted of 100 patients who underwent treatment during the period from October 2010 to February 2011. The survey was conducted in Bratislava with the consent of the patients' parents. We chose the following survey methods: a questionnaire and examination of a patient by inspection.

Results: We observed stagnation and improvement of spinal deformities in patients who were able to go through the exercise maintaining correct posture. In addition to the deformity improvement, stagnation of the condition is also considered a successful treatment.

Conclusions: Exercising while maintaining good posture positively affected spinal deformities in patients. We recommend its application in common practice.

Key words: Spine Disease, Body Posture, Correct Posture, Primary Prevention.

Introduction

Various medical fields, such as neurology, orthopedics, traumatology, rehabilitation, neurosurgery, rheumatology, osteology, oncology, infectious medicine, manual medicine, general medicine and, last but not least, psychology or even psychiatry are involved in the issue of spinal diseases. All of them are directed towards the same goal with their treatment methods, i.e. to remove pain and improve spine mobility.

There are several factors with a decisive influence on the condition of our spine, such as good body posture, walking and sitting stereotypes, physical activity, etc. (Hnízdil, 2005). Body posture is an active and constantly changing process which can be understood as the relationship between the muscular system and the bone structures, working in mutual continuity with respect to the external and internal conditions (Junior, 2011). An active posture of individual segments of the human body in relation to external forces is controlled by the central nervous system CNS (Kolář, 2009).

The change in the movement mode of a man into a predominantly prevailing static load while sitting is more and more common. In this area it is necessary to look for one of the primary causes of back pain, whose prevalence reaches up to 19% of the European adult population (Breivik, 2006). Nearly 80% of all adults experience back pain during their lifetime (Hnízdil, 2005).

Changes in lifestyle cause vertebrogenic problems in younger and younger people when acute pain arises after a sudden movement – manipulation with loads or inappropriate exercises in the gym, based on the principle of statics and dynamics disorders of the spine (Adamová, 2007).

In the present, children and young people are more and more experiencing an increasing amount of time spent sitting at school, or at home in front of a computer without being interested in movement activity, which significantly influences body posture and supports the development of various spine deformities. Interventions during childhood, consisting in the prevention of body posture disorders

and worsening of musculoskeletal disorders, is important in terms of primary prevention of the axial organ disorders (Gúth, 2003).

Correction of pathological spine curvature can be achieved by body posture correction through exercise and normal daily activities. "Correct Posture" implies that we correct – improve the patient's poor posture of body parts and the spine that are inconsistent with the so-called physiological posture. Gúth states that a precisely set posture is important during exercise and must be strictly maintained throughout activation (Gúth, 2004).

Correct Posture

Correct posture is a term we use more often in treating patients with spine deformities. This is the position in which we try to achieve optimal body posture and economical muscle coordination (Čepíková, 2009)

In correct posture when lying on back, the following conditions must be met: the patient is lying flat, the head is aligned with an extension of the body axis and the chin is tucked in, the blades are in depression and mild adduction, the hands have palms facing up, the waist area is directed to the mat, we maintain physiological waist lordosis, the pelvis is in a neutral position at all three levels, the lower limbs are bent in knees, hip-width apart, the feet are fixed on the mat (Schorová, 2002).

Correct posture lying on stomach. The following conditions have to be met during exercise lying on stomach: the patient has the cervical spine and head aligned with an extension of the body axis, the hands have palms facing down, the blades are squeezed into a letter "V" shape, the patient maintains a neutral position of the pelvis, the lower limbs are hip-width apart and the feet are kept in a neutral position (Čepíková, 2009).

Correct standing posture. The patient maintains the cervical spine and head aligned with the extension of the body axis, the shoulders and blades are pulled back and down, the pelvic muscles are tucked in, the pelvis is in a neutral position and the feet are hip-width apart, the weight is evenly distributed between both lower limbs (Blahušová, 2002).

Correct sitting posture. We start this exercise on a

solid mat, later we can add dynamic sitting on a ball or on a coccyx pillow, the principle is the same as when standing, only lower limbs are fixed with feet on a mat and bent at a 90° angle in the hips, knees and ankles (90° – 90° – 90°), respectively the hips are slightly higher than the knees (Čepíková, 2009).

Survey Methodology

This survey was conducted to find out the effect of correct posture and proper exercise on spine deformities. We applied correct body posture in basic exercise positions, both horizontal and vertical. We monitored how it was maintained during exercise lying on back and stomach and how it was maintained in prototype activities (while sitting and standing).

The aim was to find out whether patients maintain correct posture during exercise, whether they need assistance (of a parent or physiotherapist) or they maintain it on their own, whether maintaining correct posture positively affects the treatment of spinal deformities, whether the failure to maintain correct posture leads to the treatment of spinal deformities.

We chose the following survey methods: a questionnaire and examination of a patient by inspection. A survey sample consisted of 100 patients who underwent treatment during the period from October 2010 to February 2011. The survey was conducted in Bratislava with the consent of the patients' parents.

Results

Maintaining correct posture while lying on back

Figure 1 Distribution of respondents regarding whether they maintain correct posture while lying on back.

A total of 33% of the respondents maintained correct posture while lying on their back. Up to 40%

of the patients were not able to manage this posture and 27% of the patients needed assistance and control of the physiotherapist in having correct posture.

Most common mistakes: forward and backward head posture, shoulders anteversion, failure to maintain a neutral pelvis position, failure to maintain standing with the lower limbs hip-width apart, loading stress on the outside of the foot only.

Maintaining correct posture while lying on stomach

Figure 2 Distribution of respondents regarding whether they maintain correct posture while lying on stomach.

Up to 54% of the respondents were unable to maintain correct posture. A total of 29% of the patients managed to have correct posture with assistance of the physiotherapist, and only 17% of the patients had correct posture while lying on stomach.

Most common mistakes: excessive curvature of the cervical and lumbar spines, failure to maintain a neutral pelvis position, extra rotation of the lower limbs.

Maintaining correct posture while standing

Figure 3 Distribution of respondents regarding whether they maintain correct posture while standing.

Figure 3 shows that 37% of the patients did not manage correct posture. A total of 37% of the patients maintained correct posture while standing and 26% of the patients needed the physiotherapist's assistance to have correct posture.

Most common mistakes: uneven lower limb load, skewed pelvis, pelvis anteversion, chest symmetry failure, shoulders anteversion, forward head posture.

Maintaining correct posture while sitting

Figure 4 Distribution of respondents regarding whether they maintain correct posture while sitting.

The results of correct posture while sitting were identical with the results while standing. A total of 37% of the patients managed correct sitting, 37% of the patients did not manage correct sitting posture and 26% of the patients needed help to have correct posture.

Most common mistakes: loading stress on the outside of the foot only, wide sitting posture (failure to maintain the lower limbs hip-width apart), leaning against the ball with the calf, spine traction failure, choosing an inappropriate ball or chair height.

Effect of correct posture and proper exercise on spinal deformities treatment

Figure 5 Effect of correct posture on spinal deformities treatment

The last figure presents the results of the effect of correct posture and proper exercise on spinal deformities treatment. All the patients were instructed about their correct posture which they should always maintain during exercise. During the follow-up examination, we grouped the patients into three groups. The first group consisted of the patients who were independent in maintaining correct posture during exercises and performed them correctly (27 patients). The second group consisted of those who did not manage the correct posture during exercises and were not able to have it even after being guided by the physiotherapist, so the exercise was not targeted to deformity and was not correct (54 patients). The third group included the patients who needed a verbal alert of the physiotherapist to maintain correct posture and to perform the exercises properly (19 patients).

Based on the above results, in the first group of patients we recorded an improvement of spine deformities in a total of 19 patients who maintained correct posture and the condition did not deteriorate in 7 patients. There was no improvement in 1 patient, despite the correct posture. This means that maintaining correct posture and proper exercise lead to the improvement of spine deformities in almost all cases.

As shown in Figure 5, in the second group of patients improvement was not recorded in a total of 44 patients who did not maintain correct posture. In 10 patients, despite the fact that they did not maintain correct posture, we recorded stagnation, so they did not get worse. This means that failure to maintain correct posture and improper performance of exercises, in most cases do not lead to an improvement of spine deformities. Analyzing the results of the third group, we found out that of the total number of patients, 19 patients needed exercise guidance and only under the control of the physiotherapist, they were able to have correct posture during exercise. In these patients, only 1 deteriorated and up to 18 patients did not get worse. Their condition stagnated, which confirmed the success of the treatment.

Discussion

The aim of the survey was to prove the necessity of maintaining correct posture by the patient during exercise, since the patient's posture itself ensures the influence of the muscle imbalance and correc-

tion of the pathological spine curvature. We must look at the spine as a whole, and when we influence pathological curvature in the lumbar spine, we must have correct posture of the pelvis and lower limbs. Otherwise, its poor posture will move up to the cervical spine. According to Palaščáková-Špringrová, a loss of the neutral pelvis position in the sense of lordosis (insufficiency of m. trasverzus abdominis and mm. multifides and at the same time hyperactivity of m. iliopsoas) stimulates the formation of cervical spine hyperlordosis and shoulders protraction (Palaščáková, 2010).

A necessary part of the treatment is the involvement of parents in the treatment process because as many as 19% of the patients managed to maintain correct posture with the help. Some techniques require daily cooperation with a trained person – most often parents (Kolář, 2009).

Conclusion

Spinal diseases represent an interdisciplinary issue where a wide range of medical disciplines are involved in diagnosis and therapy. A dominant role of rehabilitation lies in primary prevention, in childhood interventions, aimed at the prevention of body posture disorders and worsening of disorders related to the musculoskeletal system.

The fact that maintaining correct body posture has proven value in the treatment of spine deformities by the results of the survey. We recorded stagnation and correction of spine deformities in patients who managed exercise with maintaining correct posture. In addition to the improvement of deformities, we consider stagnation of the condition as a successful treatment. The disadvantage of this exercise is that we cannot apply it to preschool patients and patients with concentration disorders, as well as to patients with CNS damage (poliomyelitis, autistic patients and other brain damage patients) because they cannot sufficiently focus on maintaining correct posture, and thus not even on the accuracy in the exercise performance. We would recommend other forms of exercise to influence spinal deformities in these patients. Since the exercises with maintaining correct posture positively influenced spinal deformities in other patients, we recommend applying it in normal practice.

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