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Preliminary results of use of SpineCor brace in Katowice (Poland)

Wstępne wyniki zastosowania gorsetu SpineCor w Katowicach

ABSTRACT

Background: The study was planned to assess the use of the SpineCor brace in patients with idiopathic scoliosis who refused treatment with a rigid brace and kinesiotherapy.

Material and methods: Fourteen patients (13 females and 1 male) aged 9–17 years (mean 12.75) were fitted with SpineCor dynamic braces. The patients presented 20 scoliosis curves ranging from 12° to 49° of Cobb angle (mean 27.4°). Eleven patients presented 15 scoliosis curves below 35°, ranging from 12° to 34° (mean 22.7°). All the patients refused other methods of conservative treatment. The outcome of the treatment was assessed after 6 months on the basis of radiological examination.

Results: After 6 months of SpineCor bracing, the mean Cobb angle showed no significant change (initial value $27.4^\circ \pm 11.26^\circ$, median 27.0°; outcome value $27.6^\circ \pm 14.58^\circ$, median 25.5°). Considering patients with scoliosis curves below 35°, the outcome showed no significant change (initial value $22.7^\circ \pm 7.9^\circ$, median 24.0°; outcome value $21.1^\circ \pm 8.8^\circ$, median 20.0°). All the patients declared further interest in active scoliosis treatment, including kinesiotherapy.

Conclusions: The SpineCor brace, with respect to its good general acceptance, may be considered as a valuable, conservative method of treatment in patients refusing other therapy. Moreover, introduction of the SpineCor brace and a careful follow-up induced increased interest in kinesiotherapy among treated patients. However, SpineCor efficacy seems to be limited to scoliosis curves not exceeding 30–35° of Cobb angle. Limited experiences and short follow-up period prevent the authors from defining the use of the SpineCor brace as a stand-alone method for conservative scoliosis treatment.

KEY WORDS: idiopathic scoliosis, SpineCor brace, dynamic brace

STRESZCZENIE

Wstęp: Badanie przeprowadzono w celu oceny wykorzystania dynamicznego gorsetu SpineCor u pacjentów z skoliozą idiopatyczną źle tolerujących leczenie z zastosowaniem sztywnego gorsetu i kinezyterapii.

Material i metody: Czternastu pacjentów (13 dziewcząt i 1 chłopiec) w wieku 9–17 lat (średnia wieku 12,75 roku) zaopatrzone w dynamiczny gorset typu SpineCor. U pacjentów stwierdzono 20 łuków skrzywienia o kącie Cobba od 12° do 49° (średnia 27,4°). U 11 dzieci stwierdzono 15 łuków skrzywienia mniejszych niż 35°, od 12° do 34° (średnia 22,7°). Wszyscy badani odmówili stosowania innych metod leczenia zachowawczego. Wynik leczenia oceniano po 6 miesiącach na podstawie badania radiologicznego.

Wyniki: Po 6 miesiącach stosowania gorsetu typu SpineCor nie stwierdzono istotnej statystycznie zmiany średniego kąta Cobba w skrzywieniach (wartość wyjściowa $27,4^\circ \pm 11,26^\circ$, mediana 27,0°; wartość końcowa $27,6^\circ \pm 14,58^\circ$, mediana 25,5°). W grupie pacjentów o łuku skrzywienia mniejszym niż 35° wynik końcowy również nie przekroczył progu istotności statystycznej (wartość wyjściowa $22,7^\circ \pm 7,9^\circ$, mediana 24,0°; wartość końcowa $21,1^\circ \pm 8,8^\circ$, mediana 20,0°). Wszyscy pacjenci zadeklarowali dalsze zainteresowanie aktywnym leczeniem skoliozy, w tym kinezyterapią.

Wnioski: Ze względu na dobrą tolerancję gorset typu SpineCor może być stosowany jako cenna metoda leczenia zachowawczego u pacjentów niezgadających się na inny sposób terapii. Dodatkową zaletą zastosowania tego typu gorsetu,

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co wiązało się z regularnymi i dokładnymi wizytami kontrolnymi, jest wzrost zainteresowania kinezyterapią wśród stosujących go pacjentów. Tym niemniej efektywność działania gorsetu typu SpineCor wydaje się być ograniczona do skrzywień nieprzekraczających wartości 30–35° kąta Cobba. Ograniczone doświadczenia i krótki okres obserwacji pacjentów nie pozwalają autorom sprecyzować wniosku, czy gorset typu SpineCor może być wyłączną metodą leczenia zachowawczego skoliozy idiopatycznej.

SŁOWA KLUCZOWE: **skolioza idiopatyczna, gorset SpineCor, gorset dynamiczny**

Introduction

Idiopathic scoliosis is a three-dimensional deformation of the vertebral column and the entire trunk. Methods of conservative treatment of idiopathic scoliosis have to take into consideration multiplanar correction of the deformity. Recently employed methods include physical therapy, scoliosis intensive rehabilitation and brace treatment [1]. The Department of Rehabilitation of the Medical University of Silesia adapts the Dobosiewicz method of kinesiotherapy and the Cheneau rigid brace, both implementing required criteria of a three-dimensional impact on the deformity.

Effective conservative treatment of idiopathic scoliosis faces two common problems: regularity of employed exercises and/or of wearing the brace, and assertion of the comfort of life. The rapid, irregular course of contemporary life and habitual daily time restrictions are common for more and more of the younger population, causing growing problems requiring methodical treatment. Although a rigid brace is generally well tolerated by children, the circumstances begin to become more complicated in adolescents. Daily use of a hard, rather uncomfortable and clearly visible rigid brace discourages youths in the pubertal period to the permanent wearing of the orthosis, often limiting its employment to several afternoon hours and the overnight period. Making the most of a physical treatment also requires extensive involvement, orderliness and the keeping of regular hours from a patient. Longer and longer school hours and numerous extramural activities often prevent the desired regularity of recommended exercises.

A dynamic brace, easy to fit and hide under clothing and only moderately limiting mobility and comfort of a patient, seems to promise avoidance of most of the mentioned problems. The SpineCor brace also supposes spatial correction of scoliosis, thus fulfilling the basic criteria of successful treatment. However, the effectiveness of the dynamic brace compared to the rigid brace remains unclear across the literature [2–5].

In December 2004, our Department of Rehabilitation gained the possibility to put into practice the dynamic SpineCor brace. It was decided to apply the dynamic brace in patients with poor tolerance of the rigid brace or physical treatment. Since the SpineCor brace is rather expensive in the economic condition of our country, the number of supported patients was limited.

The aim of the study was to assess the use of the SpineCor brace in patients with idiopathic scoliosis who refused treatment with the rigid brace and physical therapy.

Material and methods

The study included 14 patients (13 females and 1 male) aged 9 to 17 years (mean 12.75) who were fitted with a SpineCor dynamic brace. All the patients refused or abandoned other available methods of conservative treatment: the Dobosiewicz method of physical therapy — asymmetric trunk mobilisations in symmetric initial positions, and the Cheneau rigid brace. The described cases presented 20 scoliosis curves ranging from 12° to 49° of Cobb angle (mean 27.4°). 11 patients presented 15 scoliosis curves below 35°, ranging from 12° to 34° (mean 22.7°). The outcome of the treatment was assessed after 6 months on the basis of radiological examination. Standard X ray examination of the vertebral column in the anteroposterior projection was carried out without the brace 4–6 hours after de-bracing. The results were classified on the basis of the Cobb angle changes.

The employed statistical model included the Wilcoxon test.

Results

Mean initial value of the Cobb angle in the observed group was $27.4^\circ \pm 11.26^\circ$, median 27.0° . After 6 months of treatment with the SpineCor brace, 12 (60%) scoliosis curves remained stable with changes within a 5° range, 5 (25%) progressed and 3 (15%) regressed. Mean progression angle was $7.6^\circ \pm 3.61^\circ$; mean regression was $7.0^\circ \pm 3.59^\circ$. The mean outcome value of Cobb angle across all cases was $27.6^\circ \pm 14.58^\circ$, median 25.5° . The change was not significant. Considering patients with scoliosis curves below 35°, the outcome showed no significant change. The initial mean value among these patients was $22.7^\circ \pm 7.9^\circ$, median 24.0° . The mean outcome value was $21.1^\circ \pm 8.8^\circ$, median 20.0° . A detailed history of the cases is shown in Table I.

All the patients continued the treatment after 6 months and declared further interest in active scoliosis treatment, including physical therapy.

Discussion

First results of the SpineCor dynamic brace in our Department of Rehabilitation reached the main purpose of the conservative treatment of the idiopathic scoliosis, to prevent further progression of the scoliotic curve. However, literature research of the subject reveals only a limited number of publications, and the opinions among re-

Table I. Initial and final Cobb angle values**Tabela I.** Początkowe i końcowe wartości kąta Cobba

	Initial Cobb angle	Final Cobb angle	Progression
1.	12	4	-8
2.	12	19	7
3.	13	11	-2
4.	15	18	3
5.	15	13	-2
6.	19	15	-4
7.	22	16	-6
8.	24	20	-4
9.	25	24	-1
10.	26	23	-3
11.	28	34	-2
12.	29	27	-2
13.	32	31	-1
14.	34	27	-7
15.	34	35	1
16.	34	35	1
17.	34	36	2
18.	42	53	11
19.	48	54	6
20.	49	57	8
Mean	27.4	27.6	-0.2
Standard deviation	11.26	14.58	5.25
Median	27.0	25.5	1.0

searchers regarding the effectiveness of the SpineCor dynamic brace are divided. There is evidence of both global Cobb angle regression [2–4] and of no influence on the natural history of the disease [5]. Successful treatment with the SpineCor brace seems to be limited to mild to moderate scoliosis curves, but the problem needs to be further investigated. A particularly important issue is the adequate selection of patients in view of successful outcome of the treatment.

The SpineCor brace requires a careful control protocol at regular intervals. From the point of view of the therapist, the maintenance of the SpineCor brace compared to the Cheneau brace is much more complicated and time-consuming. In addition, the proper fitting of the brace requires careful attention and a certain level of ability from the patient and the parents. Thus, the proper fitting, main-

tenance and wear are then crucial in successful treatment. Indeed, complaints raised by patients commonly included relatively difficult everyday brace fitting. However, once put on, the dynamic brace caused little discomfort during the course of the day. It took a matter of only a few days to get accustomed to the SpineCor brace.

The goal of the presented study was to use the dynamic brace in cases restive to other methods of treatment in view of the level of involvement in the therapy. The SpineCor brace was well tolerated, and all patients followed the therapy. Another unquestionable benefit of the dynamic brace was the gradually increasing interest in alternate methods of conservative treatment among braced patients. Careful follow-up and even slight signs of scoliosis regression motivated patients to more careful in-sight into the problem, often resulting in an understanding that the only way to achieve therapeutic success was close cooperation with the therapist and in-depth understanding of the nature of idiopathic scoliosis.

Conclusions

1. The SpineCor brace, with respect to its good general acceptance, may be considered as a valuable conservative method of treatment in patients refusing other therapy.
2. Introduction of the SpineCor brace and careful follow-up induced increasing interest in the physical treatment among braced patients.
3. SpineCor efficacy seems to be limited to scoliosis curves not exceeding 30–35° of Cobb angle.
4. Limited experience and short follow-up period prevented the authors from defining the use of the SpineCor brace as a stand-alone method of conservative scoliosis treatment.

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