재활보조기구

게시일시 및 장소 : 10 월 19 일(토) 08:30-12:30 Room G(3F)

질의응답 일시 및 장소 : 10 월 19 일(토) 11:00-11:30 Room G(3F)

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Effect of FLEXpine brace on spinal alignment in patients with scoliosis in cerebral palsy

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Objectives

Neuromuscular scoliosis occurs frequently in children with cerebral palsy (CP) and reported incidence is up to 80%, regarding the characteristics of patients [1]. The problem of scoliosis in CP is that they tend to progress rapidly during the growing period and continue to progress from flexible form to fixed deformity [2]. These scoliosis cause sitting problem which influences vision, communication, mobility, pressure sore, feeding, pulmonary function, and pain [1, 3, 4]. However, there are only controversial reports about nonsurgical treatments using conventional thoracolumbar braces, and these conventional braces are stiff and need frequent changes as children grow. Thus, the aim of this study was to investigate the effect of a noble flexible thoracolumbar brace (FLEXpine) on the spinal alignment of neuromuscular scoliosis in CP.

Subjects and Methods

Eleven patients with CP who met the following inclusion criteria: (1) GMFCS level III, IV, and V, (2) initial Cobb's angle between 20° and 45°, (3) children who refused to take surgery even though Cobb's angle was over 45°, and (4) age between 3 and 15 years, were recruited in the tertiary rehabilitation hospital (mean age 10.64 ± 3.3 years old). The patients were treated with FLEXpine for 6 months. The effect was assessed using the Cobb's angle measured with whole spine x-ray. We measured Cobb's angle three times: baseline, immediately after wearing FLEXpine, and after 6 months. An age-, gender- and GMFCS level-matched control group, who did not use any braces, was selected from database of our hospital to compare the change of Cobb's angle. Wilcoxon signed rank test was used to compare Cobb's angle between baseline and immediately after wearing FLEXpine. Mann Whitney U-test was used to compare characteristics and changes of Cobb's angle during 6 months between two groups. P-value of less than .05 was considered statistically significant.

Results

The characteristics of the patients were listed in Table 1. The photographs of S-type FLEXpine and the whole spine x-ray of a patient before and immediately after wearing the FLEXpine were in Fig. 1. The Cobb's angle significantly decreased immediately after

wearing FLEXpine (Baseline: 52.94 ± 18.96, immediately after: 39.45 ± 21.66, p-value = 0.006) (Fig 2 (a)). Also, changes of the Cobb's angle was significantly less when compared with the control group after 6 months (FLEXpine: -4.82 ± 7.05, control: 9.08 ± 2.76, p-value = 0.000) (Fig 2 (b)).

Conclusions

The FLEXpine brace could suggest the alternative and promising treatment modality in treating neuromuscular scoliosis in children with CP. As FLEXpine brace significantly decreased Cobb's angle and is easier to wear than the conventional TLSO, daily application of FLEXpine during the growing period is expected to reduce the degree of fixed deformity in the long-term follow-up. Further studies are required to find out the long-term effect of the FLEXpine.

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Table 1. Demographics and clinical characteristics

	FLEXpine (n=11)	Control (n=15)	p-value
Age (years)	10.64 ± 3.29	9.85 ± 3.19	0.959
Sex			0.838
Male	5	6	
Female	6	9	
GMFCS level			0.574
IV	3	2	
V	8	13	
Height (cm)	113.04 ± 22.94		-
Weight (kg)	22.25 ± 10.83		-

* Values are presented as mean ± standard deviation

Fig 1 (a). S-type FLEXpine

(b). Whole spine x-ray

Baseline

Immediately after wearing the FLEXpine

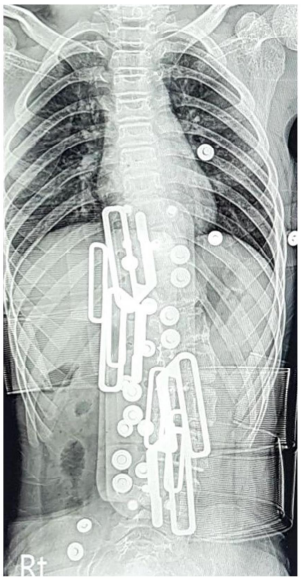
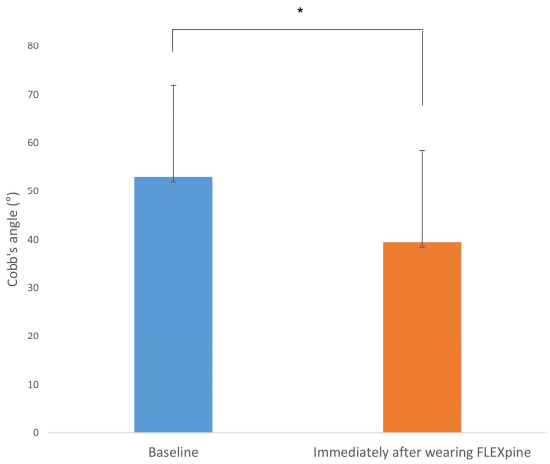


Fig 2 (a). Changes of the Cobb's angle immediately after wearing FLEXpine



(b). Changes of the Cobb's angle during 6 months