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Assessment of spine following correction of nonstructural component in juvenile idiopathic scoliosis

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Objective

The aim of the present study was to evaluate the association between progression of curvature of scoliosis and correction for functional leg length discrepancy (a functional component of scoliosis) in patients with juvenile idiopathic scoliosis(JIS).

Methods

Medical data of 52 patients (26 females, 26 males) with Cobb angle $\geq 10^\circ$ in radiology - were retrospectively reviewed. They had different hump angle $\geq 5^\circ$ in forward bending test for idiopathic scoliosis component, and uneven pelvic level at iliac crest by different RCSPA ($\geq 3^\circ$) as a factor of functional scoliosis. Their mean age was 79.5 ± 10.6 months. The mean period of wearing FO was 18.6 ± 0.70 months.

Results

Cobb's angle was reduced from $22.03 \pm 4.39^\circ$ initially to $18.86 \pm 7.53^\circ$ after wearing FO. Pelvis height difference and RCSPA difference were reduced from 1.07 ± 0.25 cm initially to 0.60 ± 0.36 and from $4.25 \pm 0.71^\circ$ initially to $1.71 \pm 0.75^\circ$ ($p < 0.01$). 1) The Cobb's angle improved significantly from $22.03 \pm 4.39^\circ$ before treatment to $19.07 \pm 6.88^\circ$ after 9 months and to $18.86 \pm 7.53^\circ$ after 18 months. 2) Results were analyzed based on the age of 6 years, the mean Cobb angle was improved in both age groups but patients under 6 years of age have been clinically improved by more than 5 degrees. 3) In analysis based on initial Cobb angle, all parameters which are Cobb angle, RCSPA difference, pelvis height difference, and hump angle were improved in the group with less than 24° . However, there was no significant improvement for those with more than 25 degrees of Cobb angle initially.

Conclusion

JIS patient may have functional components and it can be a good managements to identify the factors that can cause functional scoliosis in JIS patients, and it should be managed these functional factors. Foot orthosis are effective in correcting functional factors in the case of pelvic inequality caused by different RCSPA for patients with juvenile idiopathic scoliosis.