



Clinical effects of an innovative spinal orthosis on low back pain and pain-free walking distance

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Introduction

Lower back pain (LBP) is a common problem with a mean prevalence of 31% in general population [1]. In many cases LBP, especially in patients with radiculopathy, deteriorates with increasing walking distance, forcing people to stop after a certain distance limiting their mobility in a severe way. Treatment options include physical therapy, orthoses, surgery and/or pain medication. Physical therapy should always be a key element to strengthen back muscles in their basic function to support the bony spine structure. An innovative spinal orthosis was developed to reduce LBP and to increase pain-free walking distance (PFWD) by using a dynamic spring construction that straightens the lumbar spine. An observational study was conducted to collect data from the first clinical experience.

Methods

The 'Dyneva' spinal orthosis consists of an open metal frame construction where the upper and lower parts of the back frame are connected with a dynamic realignment spring (Figure 1). The torque of this spring is exposed to the lumbar spine during dynamic locomotion, resulting in a straightening with consequential decompression and relief of the lumbar spine.



Figure 1: 'Dyneva' orthosis (frontal/dorsal view)

31 subjects (age 65.0 ± 11.5) with LBP were treated over a period of 4 weeks with a baseline assessment prior to the fitting of the 'Dyneva' and after 4 weeks of use. The assessment included changes in pain level and the change in PFWD.

Results

The trial period with the Dyneva over 4 weeks showed an increase in the reported PFWD in 61% of all patients. 39% reported no change, and none of the patients reported a reduction. Average waking distance was increased by 602 meters (50%) (Figure 2). 26 patients rated their pain levels at baseline and after 4 weeks of Dyneva treatment. 14 of them stated a reduction of their pain level at the end of the intervention period; in 1 patient the pain level was increased.



Figure 2: average change of PFWD

Overall there was a mean decrease of pain on the VAS scale of 1.27 points; the difference was highly statistical significant ($p < 0.001$).

85% of the patients reported that they wanted to continue wearing the 'Dyneva' orthosis, since they benefitted either from reduced pain level and/or increased PFWD.

Discussion

The 4-week intervention with the 'Dyneva' spinal orthosis showed clinically and statistically significant effects regarding the reduction in LBP and the improvement of PFWD. Over 60% of the patients improved their walking distance during the intervention period, enabling them to achieve a higher grade of mobility in their daily life.

The orthosis may significantly contribute to patients' remobilization; significant clinical improvements are present for all tested indications. The subjects' high preference (85%) is a compelling first result showing the immediate effects of the 'Dyneva' orthosis.



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References

[1] Hoy, Damian, et al. "A systematic review of the global prevalence of low back pain." *Arthritis & Rheumatism* 64.6 (2012): 2028-2037.

Disclosure

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