The dynamic spinal traction system „GammaSwing“ used during inpatient rehabilitation of Low Back Pain

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Objective

Multidisciplinary rehabilitation concepts meeting ICF-criteria can demonstrably improve pain and function of patients with Low Back Pain. In the rehabilitation programmes usually active as well as passive therapies are implemented, such as traction treatment.

In a randomized, controlled study [*PREYDE, 2000*] back massage therapy – compared to sham laser therapy – was found to be effective in the non-pharmacological management of Low Back Pain.

The “GammaSwing” is a dynamic traction system for treating spinal problems. The patient can be gradually pulled up to a free-hanging position, held by specially upholstered slings which are fixed on the lower leg. The traction can be combined with an oscillating movement with a frequency up to 100 swings per minute.

The aim of the study was to investigate the effective-ness and the compatibility of the traction device GammaSwing with the rehabilitation programmes for patients suffering from Low Back Pain.

FFD	GAMMASWING			MASSAGE		
	baseline	after 6th treatment	improve-ment	baseline	after 6th treatment	improve-ment
mean	**13.52**	**9.26** **		**13.25**	**10.33** n.s.	
SD	12.61	15.57	**63.0 %**	13.68	10.24	**61.5 %**
median	12.00	4.00		12.50	10.00	
n	29	27	17	28	26	16

Table 1: **Finger-to-floor distance** (cm) ** p < 0,01

R & M	GAMMASWING			MASSAGE		
	baseline	after 6th treatment	improve-ment	baseline	after 6th treatment	improve-ment
mean	**8.71**	**5.31** ***		**11.62**	**8.14** ***	
SD	5.01	4.32	**80.8 %**	4.78	5.25	**79.3 %**
median	9.00	5.00		11.00	9.00	
n	28	26	21	29	29	23

Table 2: **Roland & Morris Questionnaire** (Score) *** p < 0,001

Conclusion

Essential improvements of the complaints of Low-Back-Pain patients can be attained by an intensive multimodal rehabilitation programme. Integration of the GammaSwing system in such a programme was well tolerated by the patients and resulted in beneficial supplementary effects, especially regarding pain on motion as well as the mobility of the spine measured by the finger-to-floor distance.

The present study on patients with Low Back Pain is the first to provide results of a randomized study comparing the GammaSwing traction therapy with conventional back massages included in an inpatient rehabilitation programme.

The circumstance that even within the framework of widespread conceptualized complex rehabilitation programmes supplementary positive effects can be demonstrated for the application of the GammaSwing argues for the use of this dynamic traction system in clinical therapy and rehabilitation of Low Back Pain.

Methods

Patients

- N = 58 (46 M, 12 F)
- Inpatient rehabilitation for 3 weeks
- Standard rehabilitation programme: active exercise therapy (hydrotherapy included), electrotherapy, thermotherapy, massage, back training, and relaxation techniques

Study groups

Groups computer-generated randomized

A 6 therapy units GammaSwing during three-week inpatient rehabilitation

B 6 therapy units back massage during three-week inpatient rehabilitation

Inclusion criteria

- Confirmed unspecific chronic Low Back Pain
- No change of the therapy programme
- Adequate mobility

Exclusion criteria

- Spinal fusion operation
- Intervertebral disk replacements
- Cardiovascular disease
- Pulmonary disease (COPD, asthma)
- Eye disease (retinal detachment, glaucoma, retinopathy)
- Pregnancy
- Osteoporosis
- Vertebral tumor
- Spondylitis
- Aneurysm
- Body weight > 100 kg
- Application for retirement

Outcome measures

- ***Pain measurement:***
  a) Pain intensity (VAS - Visual Analogue Scale: pain at rest, pain on motion)
  b) Pain Experience Scale (SES - Schmerz-empfindungs-Skala)
- ***Function:***
  Roland & Morris Disability Questionnaire (multidimensional assessment of pain-induced disability)
- ***Sleep quality complaints:***
  Pittsburgh Sleep Quality Index (PSQI – regarding the back pain induced sleep disorders)
- ***Global assessment:***
  by physician, and by patient

GammaSwing Dynamic Traction System

(Grissemann company, Kufstein, Austria): This 3-phase treatment – lifting of pelvis and lumbar spine, shoulderstand, and free-hanging position, each of them for 5 minutes – was combined with an oscillating movement of 60 swings per minute.

Results

During the inpatient rehabilitation both therapy groups showed improvements regarding all determined parameters. In particular the pain on motion (*Figure 1*) of the patients treated with the traction therapy improved significantly from 5.5 to 2.2 (in comparison the massage group: 4.5 to 2.5). This difference was also significant between both groups (p < 0.05).

The finger-to-floor distance (*Table 1*) also diminished more (p < 0.01) in the GammaSwing group (13.5 to 9.3 cm) than in the comparison group (13.3 to 10.3 cm; n.s.).

The pain experience (*Figure 2*) regarding the affective pain improved in about 80 % in both study groups (p < 0.001). Also the sensory pain was reduced clearly after GammaSwing treatment (mean 48.9 to 42.8) as well as after back massage (mean 48.7 to 44.4).

In parallel to the pain reduction a significant functional gain was found with the aid of the Roland & Morris Score (*Table 2*). GammaSwing and massage therapy, however, did not differ significantly in this functional score.

In the course of the therapy there occurred no severe undesired side-effects.

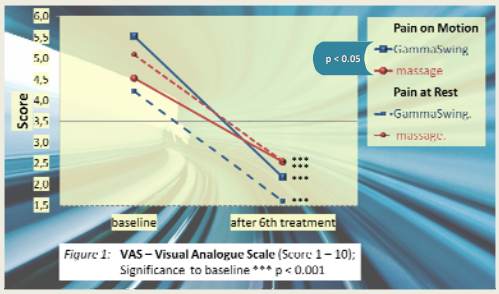

Figure 1: **VAS – Visual Analogue Scale** (Score 1 – 10); Significance to baseline *** p < 0.001

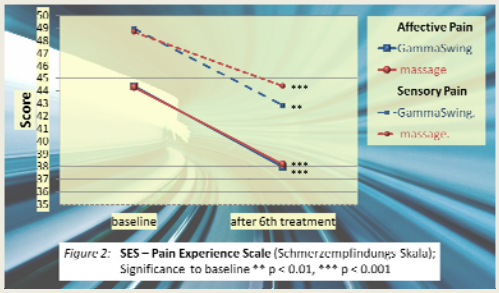

Figure 2: **SES – Pain Experience Scale** (Schmerzempfindungs Skala); Significance to baseline ** p < 0.01, *** p < 0.001