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THE EFFECT OF TWO TRAINING PROTOCOLS ON SPINAL MOBILITY OF PATIENTS WITH CHRONIC LUMBAR SPINE PATHOLOGIES

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INTRODUCTION

Lumbar spine pathologies dominate the interest of orthopaedics, as almost 80% of the human population will at some point in life exhibit back related trauma or discomfort [1]. Even though the majority of these cases do not require invasive surgery, remaining underdiagnosed is likely to result in painful repression until its manifestation. The prevalence of chronic, impairing low back pain among adult US citizens has grown tremendously over the last decade, surpassing a troubling 10% [2] while 20-40% refer to at least one incident of reoccurring intense pain over the last year [3]. According to recent socioeconomic studies, the total cost for the treatment of related cases is estimated between 100 and 200 billion\$ annually [4]. A continually increasing tendency of these pathologies during the last decade has grown to epidemiologic proportions. Considering that the related financial impact, is not only reflected in treatment costs but also in indirect costs (i.e. loss of man-days), it becomes evident that pathologies of the lumbar spine bare a significant socioeconomic influence for industrialized environments [5].

It is noteworthy, that only 5% of all patients are responsible for 75,5% of the related medical costs [6], as most of the patients avoid medical attention and retreat to self-medication. This however, often leads to recrudescence of the pathology over the course of a just few weeks [7], resulting in constant pain for approximately one year in one out of three patients. This restricts the mobility and functionality while disability has been reported to reach almost 30% of the affected population [8].

METHODS

There exists a consensus throughout literature that the most effective treatment, able of maintaining reliable improvements over long periods of time, is therapeutic training. This is of course only suggested for patients with mild pathologies and under strict supervision. An optimized however intervention for lumbar spine patients has to the best of our knowledge not been introduced.

The purpose of this study was to evaluate training methods for people exhibiting low back pain, in terms of spinal mobility during forward and sideward bending. Thirty patients (14 men and 16 women) symptomatic with low back pain, participated in the study. The sample was divided

in three equal groups of 10 patients. One group (MG) was subjected to a fitness program consisting of 3 abb exercises on a mat, while the second group (FG) used Fitball training. The third and last group (CG) was considered as a control group, not proceeding to any kind of training. The duration of the intervention was 4 weeks.

Prior to the program initiation, all the patients were asked to fill a «Modified Low Back Pain Disability Questionnaire». An overview of the severity of the patients' conditions along with their main physical characteristics is given in table 1 for the 3 examined groups. The MG group had a slightly better mean value of spinal mobility at the start of the intervention compared to the FG and thus the severity of the patients' condition are labeled as "mild +" and "mild -" respectively.

Table 1: Main characteristics (mean values) of the three examined groups.

Group	Pathology	Value	Age	Height	Weight
MG	mild +	Mean	58	171	62
		SD	5.7	6.4	8.1
FG	mild -	Mean	54	168	63
		SD	6.8	7.1	11.2
CG	mild	Mean	55	166	59
		SD	7.1	6.2	7.9

Muscular activity was monitored through an EMG Biopac MP 100 Data Acquisition Unit and spinal mobility determined by a Myrin goniometry, prior and upon training. Once all values were determined, each patients force was determined with a crossover device.

RESULTS AND DISCUSSION

Analyzing the variance of repeated measurements through ANOVA, indicated that fitball had a positive influence on spinal mobility with increased forward bending ability of almost 4°. Fitball training also had a positive impact on the patients habitual live, comparing favorably in all accounts to the results of conventional abb training.

CONCLUSIONS

Patients of the FG initially exhibited restricted mobility compared to the MG, a fact which however improved drastically to their benefit, as at the end of the intervention,

the mean values of both groups were almost identical as illustrated in figure 1.

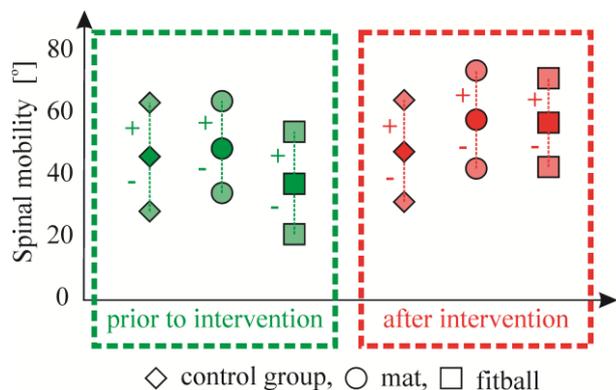


Figure 1: Relevant improvement in spinal mobility (mean value and deviations) for all three groups.

It is noteworthy that the standard deviation of the FG decreased, as all patients of the group improved towards a specific value, whereas patients of the MG increased their mobility almost proportionally to their initial condition. This

suggests that Fitball training can be used to increase spinal mobility to a point of movement regardless the preexisting condition of the patient.

A follow up of the patients implicated in this study will indicate the long term effects of the intervention and facilitate a correlation of the improvement to chronic training, as several patients expressed their interest to continue using the training program.

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