

Treatment of chronic low back pain: back school versus Hilterapia®.

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ABSTRACT

Chronic low back pain can be treated with the use of back school, drugs, physical therapy with therapeutic medical equipment, psychological therapy, life style improvement and surgery. The aim of this study was to compare the efficacy of back school treatment with a combination of back school and treatment by pulsed Nd:YAG laser (Hilterapia®).

Patients have been divided in two groups similar for age and sex: the first group was treated exclusively with back school exercises; conversely, the second group received a combined therapy of back school and Hilterapia®. Results obtained with the two therapy regimens have been evaluated measuring pain control and disability. Although an improvement has been observed in both groups, this was more evident in patients treated with the combined therapy.

INTRODUCTION

Chronic low back pain is a common pathology that can cause pain and disability. Therefore, the aim of treatment is pain resolution and best possible recovery of functional autonomy. According to the Kirkaldy-Willis degenerative cascade model [1] (see Table I), after a dysfunction phase

associated to disk and joint facets pathology, an instability phase follows. Finally, a stabilisation occurs, with fibrosis of annulus nucleus complex and posterior articulations and consequent loss of elasticity. Since 70% of the population has experienced low back pain in the past or is currently affected, and since 2 % of the adult population is constantly in therapy or off work for back pain problems [2], this pathology can be considered as disabling. Consequently, in order to evaluate therapy methods [3], in addition to pain evaluation criteria, quality of life and disability need to be accounted for [4]. Amongst the therapeutical methods commonly used, we have chosen to test those suggested by international literature as effective and free of side effects, such as therapeutical exercises [5,6,7,8,9] and analgesic laser therapy [10,11].

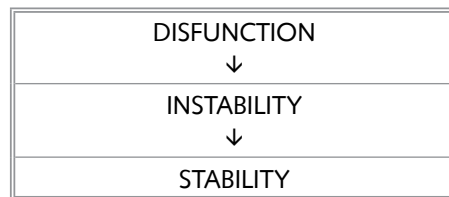


Table I - Kirkaldy-Willis degenerative cascade model

This choice is contrasting with the main national and international guidelines

[12,13], that do not consider these therapies as suitable. The former are recommended for postural exercises and postural education, while physiotherapy with therapeutic medical equipment is used for analgesic purposes within multimodal rehabilitation programs [12]. Some authors believe that there is no evidence of its efficacy while others would not use it even as second resort after patient self medication [13].

MATERIALS AND METHODS

Fifty six patients of both sexes, aged between 18 and 65, suffering from unspecific chronic low back pain (that had lasted for more than 4 weeks) and with enrolment VAS values of more than 30, have been examined.

Exclusion criteria were as follows: basal VAS less than 30, pregnancy, severe traumatism, non spinal back pain, caudal syndrome, suspected or assessed neoplastic pathology, mild trauma in those patients suffering from osteoporosis, febrile infection in patients recently undergone surgery or therapy with intravenous injections, medical history of ankylosing spondylitis, fibromyalgia syndrome.

The study has been designed according to a parallel randomised procedure where patients have been randomly assigned to the two therapy groups:

Group a) back school with Hilterapia®

Group b) back school without Hilterapia®

Table II describes the back school exercise program.

Hilterapia was administered by using a pulsed Nd:YAG laser (ASA S.r.l., Vicenza, Italy) according to the protocol described in Table III.

1) UPPER LIMBS STRETCHING EXERCISES
2) Lower limbs stretching exercises
3) Klapp kneeling position
4) Costal and diaphragm ventilation
5) Muscle strengthening
6) Repeat stretching exercises
7) Exercises at the mirror to find neutral posture

Table II - Back school exercise program.

PHASE	SUBPHASE	FLUENCE MJ\CM ²	FREQUENCY	MODE	TOTAL ENERGY
Initial	Step 1-500	660	Level 11	fast	1500
	Step 2-500	710	10	fast	
	Step 3-500	760	9	fast	
Intermediate	Four points 18-20 J	660	Level 7		
Final	Step 1-500	660	Level 11	Slow	1500
	Step 2-500	710	10	Slow	
	Step 3-500	760	9	Slow	

Table III - Hilterapia protocol

Evaluation at enrolling was performed by a first operator that referred the patients to the physiotherapist, who randomly divided them into the two therapeutical regimens. Results have been quantified blindly by another operator using VAS and modified Oswestry scales, the latter allowing to test the main elements of relation life as described in Table IV.

Data have been analysed using Student's T test and differences were considered significant for $p < 0.01$.

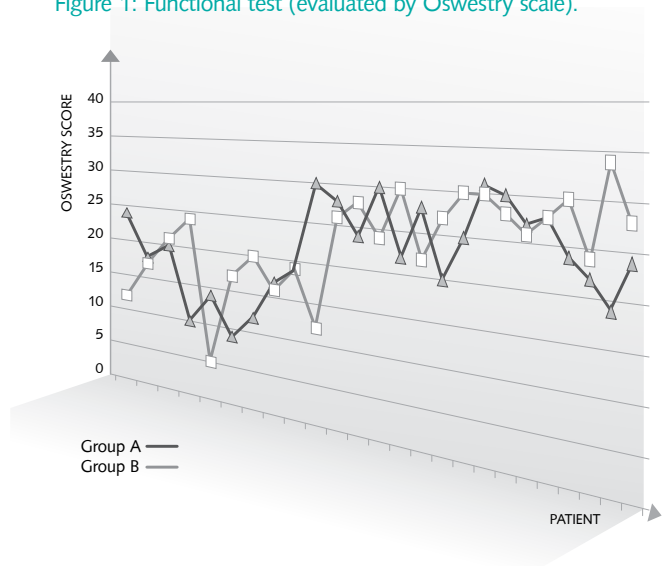
PAIN INTENSITY
Personal care
Manual activity
Walking
Sitting
Standing up
Sleeping
Sexual activity
Public relations
Moving and travelling

Table IV - Items of Oswestry scale

RESULTS

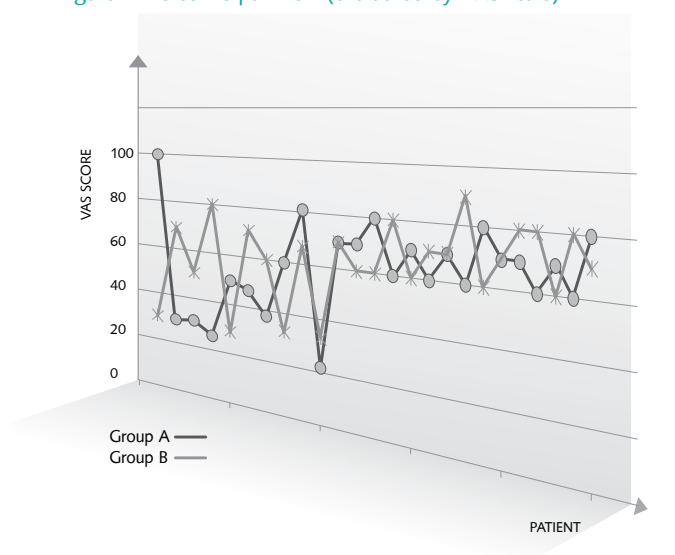
Twenty eight patients, have been assigned to each group: study group (A) and control group (B). They showed similar functional tests with mean disability recorded at enrolment of 21.39 for group A and 19.60 for group B, a difference that is not statistically significant (Figure 1). Samples resulted homogeneous also for the perceived pain test, with a mean score of 60 in group A and 63.3 in group B, a difference not statistically significant (Figure 2).

Figure 1: Functional test (evaluated by Oswestry scale).



Mean A: 21.39 St. Dev. A: 6.9
 Mean B: 19.60 St. Dev. B: 5.98
 Degrees of freedom: 54
 t: 6.82 p 0,001
 Not Significant

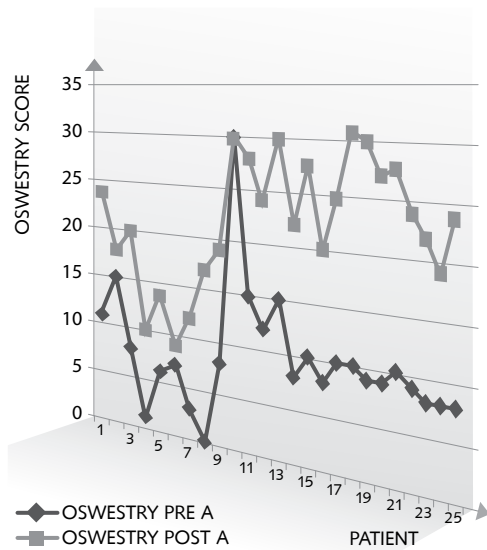
Figure 2: Percetive pain test (evaluated by VAS scale).



Mean A: 60 St. Dev. A: 19.5
 Mean B: 63.3 St. Dev. B: 16.8
 Degrees of freedom: 51
 t: 0.66 p=0.5122
 Not Significant

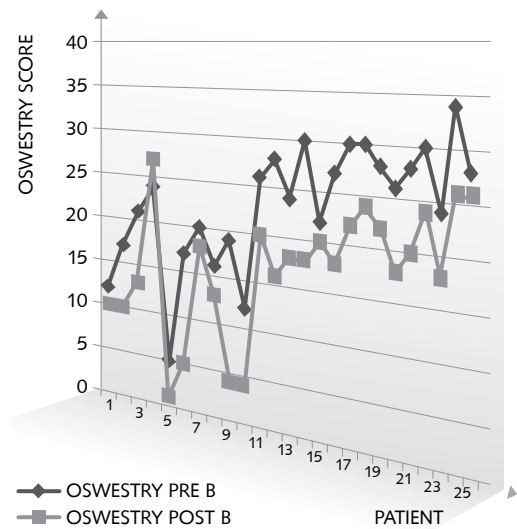
Results about disability and pain changes over time for group (A) and group (B) are shown in Figures 3,4,5,6. Comparison between results obtained in the two groups at the end of treatment is shown in Figures 5 and 6.

Figure 3



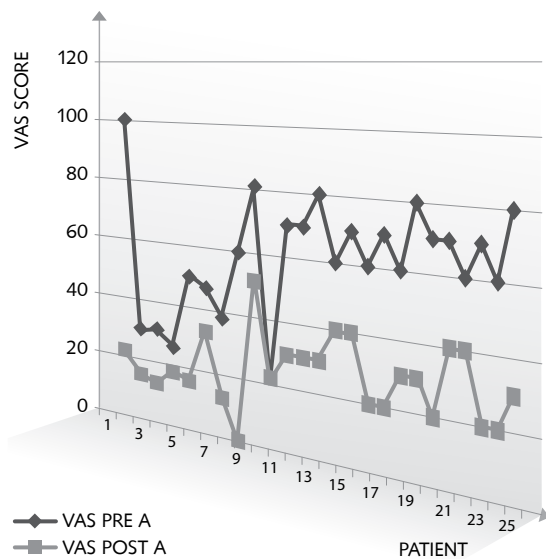
Mean before 21.39 after 9.60
 St. Dev. before 6.90 after 5.98
 Degrees of freedom 54
 t 6.8235
 Significant with $p < 0.01$

Figure 4



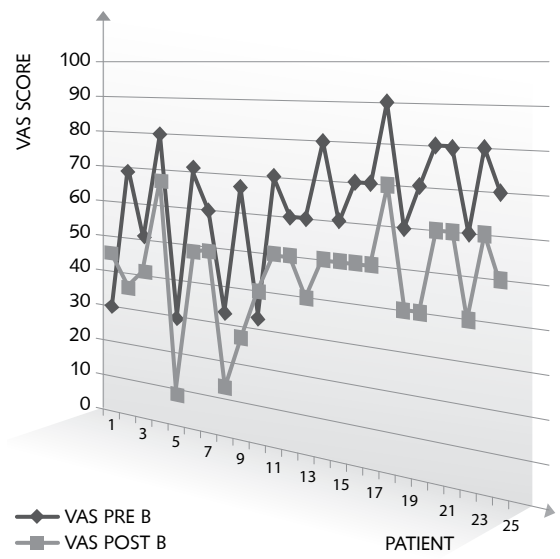
Mean before 23.12 after 16.60
 St. Dev. before 6.98 after 7.38
 Degrees of freedom 48
 t 3.2079
 significant with $p = 0.0024$

Figure 5



Mean before 60 after 27.9
 St. Dev. before 19.5 after 15
 Degrees of freedom 54
 t 6.9662
 significant with $p < 0,01$

Figure 6



Mean before 63.32 after 45.3
 St. Dev. before 16.80 after 14.3
 Degrees of freedom 48
 t 4.068
 significant with $p < 0,01$

Figure 7: Differences in functional tests after therapy in group A compared to group B.

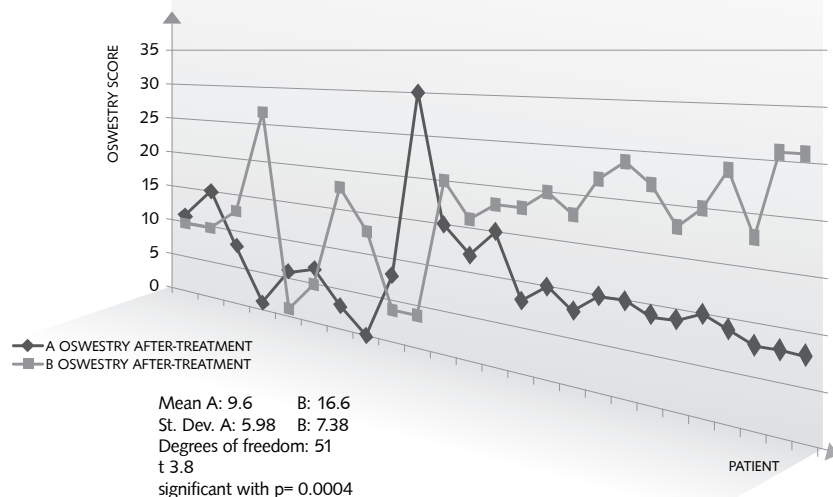
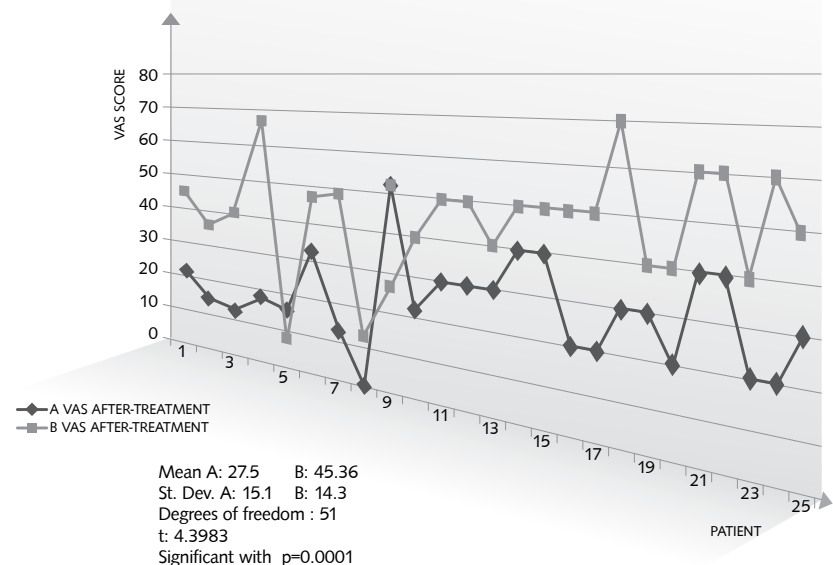


Figure 8: Differences in perceived pain after therapy in group A compared to group B.



DISCUSSION AND CONCLUSIONS

As already discussed by other authors [9], results obtained in Physical and Rehabilitation Medicine fields, need to be submitted to selective criteria of statistical analysis to be validated. Moreover, it is paramount have large numbers of samples to validate the promising results obtained with physical means with high therapeutical potential such as pulsed Nd:YAG laser. The results from our study clearly show that both therapies used are effective in the management of chronic unspecific

back pain, especially when back school is combined with Hilterapia®.

A rigorous statistical analysis applied to our samples had shown that these therapies are effective and they should therefore be considered suitable therapeutical choices, since:

1. They have a low biological impact, being virtually free of side effects as opposed to pharmacological therapies;
2. They are able to reduce considerably the pain and can also help to reduce the consequent disability associated with the pathology.

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