

POSTURAL BALANCE IN LOW BACK PAIN, COMPARISON BETWEEN BACK SCHOOL AND KINESIO TAPING METHOD

The aim of this study was to compare the Back School, Kinesio Taping method and the combination of both, to try to determine which of the three, in combination with manual treatment already scientifically validated, was the most effective in the treatment of symptoms and in the posture of the patient suffering from "chronic low back pain".

30 patients with chronic low back pain were selected for this study; the same, were divided, using in the draw method, in three groups:

1. A-Group
2. B-Group
3. C-Group

All three groups were treated, in the first instance, with manual therapy which included massotherapy, pompage or mobilization; afterwards, the A-Group patients were treated with Back School exercises that they can do also at home; at the B-Group people was applied the Kinesio Tape and at Group C have been applied both methods.

In particular, the exercise program included exercises of mobilization of the spine in both flexion and rotation, stretching for hamstring muscle, and exercises with Bobath ball; while with for the tape application, the techniques most used were muscle inhibition and facilitation of the paravertebral musculature, and both the quadratus lumborum, and, in some cases, piriformis muscle. FOTO??

In addition to these, I used the technique of space correction in case of painful points and sometimes mechanical correction technique at lumbar level but with minimum tension, closer to 50% to 75%.

All groups were treated for a cycle of 9 sessions, which have a duration of 40 minutes each, with a frequency of 3 times a week.

All patients were evaluated before and after the 9 sessions, with the Spinometria Formetric and using the Oswestry; after that, for each patient, was made a physiotherapy assessment.

In addition, during each session, have been assessed and measured the active ROM (Range of motion) and VAS into three times: before the treatment (T0), after the manual treatment (T1) and at the end of the session (T2).

The results generally demonstrate that patients treated with both methods have had a greater benefit both in symptoms and in postural improvement; this results weren't only in the short term, but the they were kept longer in time even after the end of treatment cycle; this was demonstrated by the reevaluation performed after one month.

However, we must remember, that the sample is quite small (10 people for each group), then some results might not be very significant from the statistical point of view.

In particular, analyzing the data for reduction of pain (VAS), I found that all treatments are effective with almost similar results, although looking at the data on the graph you see a major improvement in the treatment which use only the tape (5.4 points);

- **Grafico VAS dopo 9 sedute**

but not only that, in fact the study has also shown that patients of both groups B and C have had more benefit already after the first session, while patients in Group A only starting from the 5th.

- **Grafico VAS 1-5-9**

Also for Oswestry Disability Index improvement, was most effective the combined treatment with an average change between the first and second readings about 25%, higher than that of groups A and B (respectively 17.8% and 21.1%).

- **Grafico ODI dopo 9 sedute**

The same result was also obtained for the active ROM in flexion, extension and right and left Rotation: subjects treated with both methods have found, once again, better results than the other groups. Then, thanks to data that emerged from the second statistical study, I can state for a certainty that this treatment, is the best for joint recovery.

- **Grafico FLEX 9 sedute**

In particular, looking at average values, you notice how, in the mobility in flexion, the result obtained from Group C (1-5=8,8) appears to be most influenced by the tape application compared to the exercises, because between the first and fifth sitting Group B gets a gain of 6.5 cm, and, on the contrary, the A- group has an improvement of only 4 cm;

- **Tabelle A e B valori medi e dev.st**

This assertion can be confirmed by many studies about the application of Kinesio Tape at lumbar level, that showing evidence of improvement in flexion up to 17 cm¹.

- **TABELLE A e B media e dev.st**

The same observations must be made also to the results of extension ROM

- **Grafico EXT 9 sedute**

In fact, as you can see from the chart, the biggest improvement occurred in Group C with an average of 15.4°, compared to B (11.8) and Group A (6.7); also in this case there seems to be a greater contribution from the tape than the gym.

Even the right and left rotation is more increased in Group C (19.6° right and 20.9° left); in this case, the results obtained by the Group A and B are similar, although the B-group subjects remain almost unchanged, too longer than A-Group people.

- **Grafico rot dx**
- **Grafico rot sx**

Even in this case, patients in Group A are minor improvements and this results are maintained for less time.

These results may be due either of compliance of patients who don't exercises at home, or in patients who have belated experience with the exercises, so they get results later.

Analyzing left and right Side data of the different groups, I have encountered a major improvement in patients treated with exercises and Kinesio Tape, (12.5 right 11.8 left)

- **Grafico SIDE dx**

In contrast to other, Group A (blue column) presents a very large standard deviation (approximately 7.8), this means that some patients may have reported even worse results with only exercises. So this proves a major contribution by the tape in associated treatment applied to group (C).

- **Grafico SIDE sx**

¹Yoshida A., Kahanov L.; the effect of Kinesio Taping on lower trunk range of motions. Res Sports Med. 2007; 15:108;

Going to analyze the results obtained from the comparison between the two surveys carried out with the FORMETRIC Spinometria, in relation to the reference value, on the board

- **Tabella valori di riferimento**

Improved (I) the patient approached the range or has entered;

Worsened (W), the subject has left the range or has gone out;

Unchanged (U), the patient, who was already in the normal range during the first survey, remained always in the range also during the second survey;

Same value (S), the subject is outside the normal range during the 1 and the 2 reading.

The group C has got the most improvement and minor deterioration in percentage (M = 33%; P = 8%), with the 41% of patients "Unchanged" and only 18% of patients remained outside the normal range in both the first and second readings.

- **Istogramma confronto tre gruppi**

It should be noted that groups A and C have the same percentage (41%) of patients "unchanged" but, unlike the Group C, Group A has a greater percentage of patients worsened (14%) and a lower percentage (18%) of patients improved; thus, between the two, the combined treatment is more effective than the Back School.

The latter treatment is less effective in terms of posture, even compared to the group treated with tape; in fact, the Group B has less "I" patients (38%), 30% of patients improved and only 21% of patients remained outside the normal range (S). This means that treatment with the only tape is able to make major changes in postural exercises than Back School.

To assess the significance of the data, I did two statistical tests using the ANOVA, with the first, I demonstrated that, for each parameter to each group, all the treatments have been effective in changing the patient's clinical condition; to do this I compared to results obtained in T0 on the first session to T2 in the last sitting.

- **Tabella statistica singole????**

In this study I got F values above the reference value (critical) that allowed me to reject the null hypothesis for all parameters, confirming that there is statistical evidence of effectiveness of methods applied.

Then using the second test, ANOVA, I compared at the same time, for each parameter, the improvements of all groups, to see whether the results could be considered statistically different from each other.

In this case I have found many results (look at the data on the board):

1. in most cases the test revealed significant difference between groups,

- **Tabella statistica tre gruppi FLEX EXT ROT**

For this parameters, where tests has shown the significance of results, it was confirmed the greater efficacy of combined treatment

As can be seen from the tables the greatest F value highlights the significance of the data and allows me to assert that for flexion, extension and rotation, the combined treatment is most effective in changing the condition of chronic low back pain patient.

2. While for the **VAS**, **Oswestry** and **right/left Side** I haven't found evidence of statistical significance, despite the first tests had confirmed the presence of true effectiveness of the treatments also for these variables.

- **Tabella statistica tre gruppi VAS**

However, precisely because of the fact that improvements at the end of the nine seats were quite similar, comparing the results with the ANOVA statistical test showed an F value equal to 0.25, therefore, lower than the critical value (3.35). For this reason I have to say that Kinesio Tape has no statistically significant effect in improving the VAS for patients with chronic low back pain.

- **Tabella statistica tre gruppi ODI**

How you can see from the figures, there is a gap that we can consider the comparison meaningful; in fact statistical test turned out an F value of 0.93, that isn't high enough to confirm that the combined treatment bring a significant improvement of ODI in chronic low back pain.

- **Tabella statistica tre gruppi SIDE dx/sx**

However, after the second test, which compared data from all three groups for the parameter "Side", I got a result that has not shown any evidence of statistically significant difference between the different treatments; This can be explained by the fact that all treatments have brought similar entity changes, so I cannot reject the null hypothesis for these parameters.

You can't certainly skip the results without statistical significance, but to fully understand the results, we must necessarily refer to both statistical studies conducted, so as to assess, at the same time, if there is or not a clinically relevant change on patient's symptoms.

FOLLOW UP

After one month patients were contacted and was made the follow up; I re-evaluated the VAS, recording, in some patients, a slight increase of pain, while others had kept unchanged the result achieved at the end of 9th session.

- **Grafico valori VAS A-B-C**
- **Grafico istogramma valori medi VAS**

In detail, in Group A, only 10% have kept the results obtained, and the change was by 0.9 points.

Group B, on the other hand, is one that has undergone major changes (1.1 points), with only 40% of patients that has kept progress.

In Group C, 70% of patients has retained the value obtained in 9th sitting, while the remaining have registered a small average increase of pain about 1 point; then, on average, the variation of VAS in this group was only by 0.3 points.

These data can be explained, by the fact, that the tape is a method that depend on the operator, so, when the patients remove the tape after maximum 5 days from the end of the treatment, they can't re-apply it, while the exercises can be performed independently from the patient even at home.

so it depends on this factor the maintaining results and, consequently, having the slight variation of VAS in group A.

- **Valori ODI istogramma**

Also, patients have recompiled the Oswestry Disability Questionnaire, and it appeared that group C patients have undergone a minor variation of the ODI (2.3%) as compared to group A (2.98%) and B (3.37%); finally was made another survey with the FORMETRIC

- **Grafico follow FORMETRIC**

From this survey, which it is revealed that 74% of Group C patients kept postural alignment modifications gained in the 9th session, while only 26% is returned back to the start condition. In

Group (B) 68% has maintained progress, while in Group A only 59% of subjects has preserved the progress.

Finally, the clinical study has highlighted the most effective, both in the short and in the long term, of the association of both method (Kinesio Tape and Back School exercises), with manual therapy for the treatment of patients suffering from chronic low back pain.

This combination of therapies proved, as can be seen from the graphs, the best results in the treatment of symptoms and re-balancing tonic posture system;

It is useful to point out that, for many parameters results have shown a greater contribution from the tape compared to exercises in the therapeutic goal.