

# Horizontal Therapy in the Treatment of Lower Back Pain Caused by a Recent Osteoporotic Vertebral Fracture

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This multicenter study was carried out on a population of female patients suffering from lower back pain due to a recent vertebral fracture.

The painful symptoms were controlled using an innovative, medium frequency and constant intensity analgesic current, known as Horizontal Therapy.

The double blind results were compared with Interferential Current therapy and a placebo.

This joint study was carried out by the Physical and Rehabilitative Medicine departments of the G. D'Annunzio University of Chieti and the University of Verona.

## Introduction

Rachialgia is certainly one of the most frequent problems treated by physiatrists in rehabilitation facilities on a daily basis.

The numerous therapies have to tackle a multiform and multifactorial pathology, in which inflammatory, biomechanical, postural, and psychological/social aspects are combined.

On the other hand, the osteoporotic vertebral fracture is considered a reproducible biomechanical model, with a component linked to the progressive dislocation of the articular faces and with a muscular imbalance, which is also apparent in parts of the anatomy some way away from the rachis.

In view of the above, we proposed using an analgesic electrical current, introduced relatively recently to Italy. This report presents the results we obtained at the Osteoarticular Rehabilitation Department of the University of Verona and the Chair of Physical and Rehabilitative Medicine of the University of Chieti.

The current in question is Horizontal Therapy (HT), a medium frequency current of constant intensity. By continuing to "fluctuate" between 4400 and 12300 Hz, it manages to produce bioelectrical and biochemical effects in the same spot.

This current was compared, in double blind, with a traditional analgesic current such as the Interferential Current (IFC) and a placebo (PL), in keeping with a previous study protocol, based on earlier experience with the same type of current.

## Material and Method

The pain treated was linked to recent vertebral fractures of the T12-L5 tract (within the last three months), without signs of radical suffering.

A total of 200 female patients were studied, with an average age of 70.3 (SD 7.4, min. 50, max. 86). They were

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subdivided as follows: 60 were treated with HT and medical gymnastics, 70 were treated with IFC and medical gymnastics, and 70 with HT placebo and medical gymnastics.

Patients were assessed before the start of treatment (T0) and at the following intervals: after ten days of treatment (T1), and then one month (T2) and three months (T3) from the end of treatment.

We used the:

- visual analog scale (VAS) from zero (no pain) to 10 (severe pain)
- Backill scale for disability caused by lower back pain (7), with a score ranging from a maximum of 44 to a minimum of 9.

The treatment was administered, in double blind, as follows:

- HT: Ten sessions of 30 minutes each (working on the lower back) using the "chronic pain" program (frequency from 100-4400 Hz) with three electrodes; the intensity was kept at the level of the threshold of perception
- IFC: Ten sessions of 20 minutes each, working on the lower back, using the pain and contracture program (200 Hz), protocol 4 standard electrodes, below the threshold of bearability
- Placebo: Same HT protocol, current intensity of zero

The medical gymnastics essentially made use of the principle of the elongation of the rear kinetic chain and the mobilization of the sternum-scapula-humeral and pelvic subsystems. The sessions were held daily for ten days, with each session lasting 50 minutes.

## Results

The group of 60 patients treated with HT and medical gymnastics had an average age of 70.6 (SD 6.96) (Group A).

The pain at the start of treatment, measured at assessment T0, was recorded as 8.6 (SD 1.14), falling to 6.25 (SD 1.64) after the first ten days of treatment, measured at assessment T1. The pain fell further to 4.96 (SD 1.61) at one month from the end of treatment, at assessment T2, right down to 3.8 (SD 1.70) at three months from the end of treatment, at assessment T3.

At T0, the Backill scale was recorded at 23.6 points (SD 5.08), climbing to 26.1 points (SD 4.71) at T1, then to 28.2 points (SD 5.32) at T2, and 31 points (SD 5.61) at T3.

The 70 patients treated with IFC and medical gymnastics had an average age of 71 (SD 7.15) (Group B).

The pain was recorded at 8.6 (SD 1.07) at T0, falling to 6.5 (SD 1.18) at T1, and then to 5.3 (SD 1.57) at T2, finally reaching 4.77 (SD 1.89) at T3.

The Backill Scale recorded 23.3 points (SD 6.37) at T0, climbing to 35.7 (SD 5.64) at T1, then to 27.9 (SD 4.91) at T2, and finally to 28.8 points (SD 5.92) at T3.

The remaining 70 patients, treated with HT placebo and medical gymnastics, had an average age of 69.7 (SD 8.2) (Group C).

The VAS scale recorded 8.5 (SD 1.02) at T0, then falling to 6.2 (SD 1.55) after ten days (T1), remaining at 6.2 (SD 1.58) at one month (T2), and then climbing to 6.5 points (SD 1.83) at T3.

The Backill Scale recorded 23 points (SD 6.37) at T0, climbing to 24.8 (SD 4.81) at T1, then to 25.3 (SD 4.17) and settling at 25 points (SD 4.94) at T2 and T3 respectively.

## Discussion and Conclusions

With regard to the use of the treatment time, we sought to make the two treatments as similar as possible, reducing the recommended Horizontal Therapy treatment time from 40 minutes to 30 minutes and increasing the Interferential Current treatment time to 20 minutes. We believe that this made it possible to reduce the differences in terms of therapeutic application.

The three groups were treated in association with a medical gymnastics program, inasmuch as international literature demonstrates the effectiveness of the above gymnastics in maintaining the bone mass.

In reference to the data that emerged from the three treatments, it should be observed that:

- 1) The reduction in pain with the Horizontal Therapy treatment is consistently significant at all assessment times T0, T1, T2, and T3, as is the increase in the Backill values.
- 2) The reduction in pain with the Interferential Current treatment is consistently significant at all assessment times T0, T1, T2, and T3, while the increase in the Backill values is significant at T1, that is to say at the end of treatment, but is not significant at T2 and T3, or rather at 30 and 90 days from the end of treatment.
- 3) The decrease in pain with the Horizontal Therapy Placebo treatment is only significant when comparing T0 and T1, and the same can be said for the Backill increase.  
In reference to the comparison of the data that emerged from the three treatments, it should be observed that:
- 4) There are no significant age differences between the three groups.
- 5) There are no significant differences between the three groups with regard to assessment T0 and T1, in terms of pain progress and the Backill Scale.
- 6) The Horizontal Therapy treatment demonstrates significantly different results compared to the Interferential Current treatment at assessment T2 and T3, in terms of both the pain and the Backill scale.
- 7) The Horizontal Therapy treatment demonstrates significantly different results compared to the Horizontal Therapy Placebo treatment at assessment T2 and T3, in terms of both the pain and the Backill scale.
- 8) The Interferential Current treatment demonstrates significantly different results compared to the Horizontal Therapy Placebo treatment at assessment T2 and T3, in terms of both the pain and the Backill scale; in this case, it should be observed that the significance is less striking than that obtained with Horizontal Therapy treatment in Group A.

The group treated with the Horizontal Therapy Placebo recorded an interesting result, with a significant improvement being observed at the end of the treatment period. This could be linked to both the natural recovery of the osteoporotic fracture and the compliance of the patients themselves, who underwent a therapeutic approach with the hope of improving their symptoms.

In conclusion, the results of the multicenter study demonstrate that treatment with Horizontal Therapy should be recommended for managing the pain caused by a recent lower back fracture. In fact, it should even be preferred to the more commonly used Interferential Currents, inasmuch as Horizontal Therapy has shown itself to be suitable for reducing pain and increasing functional capacity in the medium term, that is to say, in the three months following treatment. It is a well-known fact that osteoporotic lower back fractures have a tendency toward a relapse in symptoms, with an associated reduction in functional capacity. Once this has been triggered, it usually continues for a period of six months after the fracture occurred.

Therefore, in our opinion, the use of an electrical therapy with these characteristics is able to offer greater protection for osteoporotic patients who fit this pathological picture.

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