

TRANSLATION

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Pulsed Signal Therapy in Degenerative Joint Disease: Our Experience

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Introduction

Pulsed Signal Therapy (PST) represents a non-invasive method that has been demonstrated to restore the physiological signals that the microenvironment of the cartilage extracellular matrix loses when it encounters situations of imbalance^{4,5}.

In fact, it has been shown that exposure to low frequency pulsed magnetic fields (PEMF) promotes chondrogenic differentiation and synthesis of the proteins of the cartilage extracellular matrix^{1,2}.

PEMF have a large number of well-documented effects, which include gene over-expression in a particular way, the ultimate aim of which is the synthesis of aggrecan and type II collagen^{1,2}.

Pulsed Signal Therapy represents an evolution of the pulsed electromagnetic fields (PEMF): both methods employ rectangular signals, but unlike PEMF, where the signals are equal, the stimuli of PST are of varying intensity and duration. In this way, the pulsed signal, supported by the magnetic field, is transmitted to the chondrocytes of the damaged tissue and recognized as a quasi-biological signal, thus able to reactivate the process of regeneration of the extracellular matrix³.

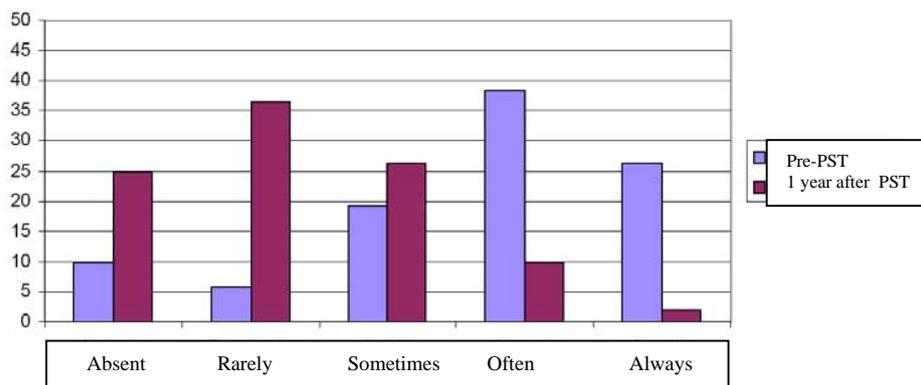
Conclusions

Pulsed Signal Therapy (PST) represents a non-invasive method that allows recovery of the physiological signals necessary for the maintenance or restoration of their capacities for physiological synthesis. For this reason, it is applicable to all the connective tissues of the locomotory system and is without known side effects.

In our experience, PST has proven to be a physiological and non-invasive method that is able to relieve pain and improve limitation of movement; depending on the type of disease we have been able to find a significant increase in mobility and a marked reduction in pain, even achieving total elimination of a VAS score of 9-10 in patients with osteoarthritis of the knee and a VAS score of 7-8 in OA of the hip.

Osteoarthritis of the knee (52 patients)

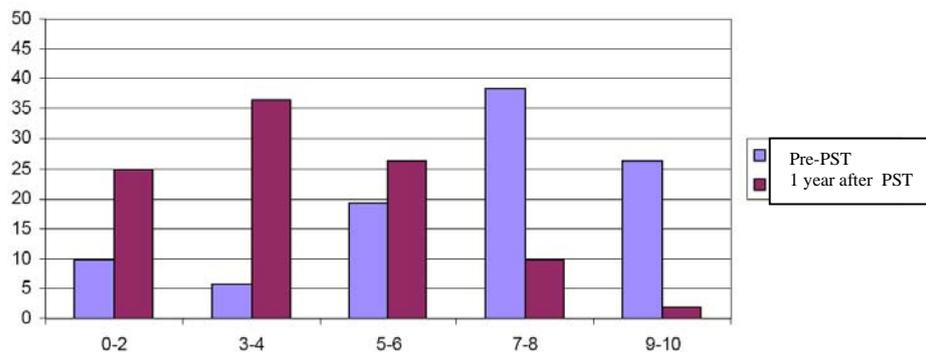
Motor limitation (WOMAC index)



It can therefore be noted that a year after the cycle of treatment with PST, there has been a general improvement of this parameter, distributed thus in 5 degrees of intensity:

- Absent: an increase equal to 160.4% (15.4 percentage points), changing from 9.6% to 25% of the involved population;
- Rarely: 5.4-fold increase (30.8 percentage points), changing from 5.7% to 36.5% of the involved population;
- Sometimes: increase of 37% (7.1 percentage points), changing from 19.2% to 26.3% of the involved population;
- Often: reduction of 70%, changing from 38.5% to 9.6% of the involved population;
- Always: reduction of 93%, changing from 26.35% to 1.9% of the involved population.

Intensity of the pain (Visual Analogue Scale)

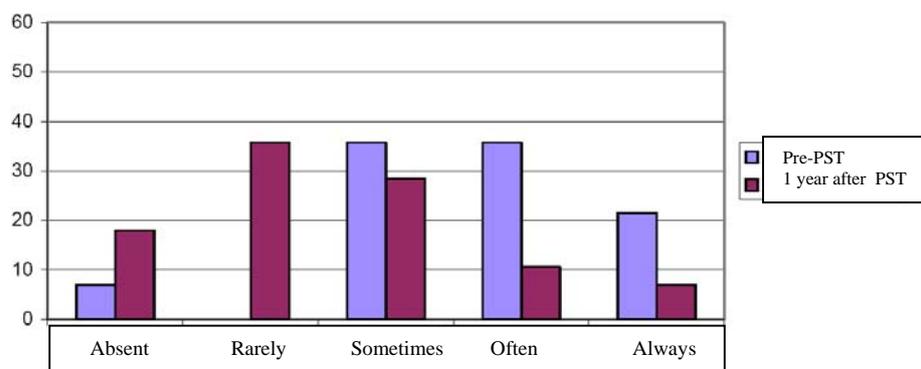


Evidence can therefore be noted of:

- A 15-fold increase (53.9 percentage points) in the VAS score of 0-2 (pain absent or mild);
- A 92.6% increase (12.5 percentage points) in the frequency of presentation of a VAS score of 3-4 (mild to moderate pain);
- A 57.8% decrease (21.1 percentage points) in the presence of a VAS score of 5-6 (moderate to severe pain);
- A 98% decrease (41.4 percentage points) in the VAS score of 7-8 (very severe pain);
- Total disappearance of the VAS modality of 9-10 (extreme pain).

Osteoarthritis of the hip (28 patients)

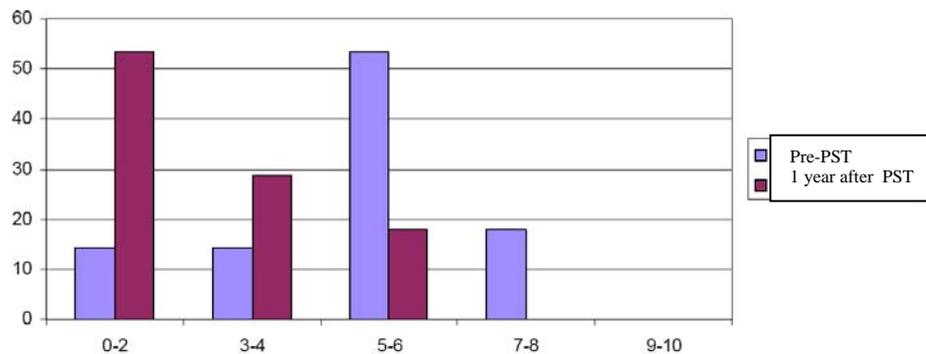
Motor limitation (WOMAC index)



It can therefore be noted that a year after the cycle of treatment with PST, there has been a general improvement of this parameter, as can be observed in the distribution shown above; in particular:

- Absent: an increase of 155.7% (10.9 percentage points) is noted, changing from 7% to 17.9% of the involved population;
- Rarely: this changed from absent to a prevalence of 35.7% of the population surveyed;
- Sometimes: a reduction of 20.1% (7.2 percentage points) is noted, changing from 35.7% to 28.5% of the involved patients;
- Often: a reduction of 70% (25 percentage points) is noted, changing from 35.7% to 10.7% of the involved population;
- Always: a reduction of 67.5% (14.5 percentage points) is noted, changing from 21.5% to 7% of the involved sample.

Intensity of the pain (Visual Analogue Scale)



It can therefore be noted that the following was obtained after a year:

- A 2.74-fold increase (39.3 percentage points) in the frequency of presentation of a VAS score of 0-2 (pain absent-mild);
- A doubling (14.3 percentage points) of a VAS score of 3-4 (mild to moderate pain);
- A 66.6% decrease (35.7 percentage points) of the presence of a VAS score of 5-6 (moderate-severe pain);
- Total disappearance of the presence of a VAS score of 7-8 (very severe pain).