Hypotheses

- The mechanical vibrations of low and medium frequency applied to the spine can contribute to the remodeling of the shape and height of the intervertebral disc having positive effects in the treatment of degenerative diseases of the dorsal spine.
- By associating mechanical vibrations of low and medium frequency to the kinetic treatment one might obtain superior results by comparison to the kinetic treatment alone. The vibrations contribute: to the improvement of functional indices and parameters, to the relief of pain or discomfort, to the reduction of treatment time.

Material and method

The experiment has been conducted in The Clinical Rehabilitation Hospital in Băile Felix with the consent of the management staff and supervised by the head physician, Gheorghe Moraru, within June 2009-June 2010 with a device that I created: **FELIX 1** (See photo 1)

Photo1: FELIX 1 Device

I have selected a group of 24 patients, homogeneous as regards the diagnosis (lower back arthrosis, dorsalgias), without associated diseases, between 30 and 60 years old; group A= 12 males and group B= 12 females, with incipient or advanced degenerative illness of the dorsal spine. (See the table below).

During the 10 days of treatment the patients have had the same procedures of treatment. I have divided the kinetic treatment in two halves: in the first five days we have done kinetic treatment without vibrations and in the following five days we have done kinetic treatment followed by vibrations.

It is well known that pain is a subjective factor. That is why we have to take this into consideration.

I have asked the patients to appreciate their pain level in the 10 days of treatment both at the beginning and at he end of each session of kinetic treatment on the ANALOG scale in which 10 is the highest level of pain the patient feels and 1 is the lowest. The appreciation of pain has been done separately in the first 5 days of treatment (kinetic treatment without vibrations) and in the next 5 days of treatment (kinetic treatment followed by vibrations)

The frequencies and amplitude=force of vibrations and time of exposure used during the treatment have been settled in collaboration with the patient, him/her being an active part within the experiment. The vibrations have been applied on the dorsal portion of the spine between C7 and T12 (see photo 2).

The parameters that have been used have been settled in collaboration with the patients, them being an active part within the experiment. The frequencies used were between 1Hz - 16Hz, on one, two or all three vibrating segments with amplitude between 100 grams force up to 1 Kilo. The time of exposure to vibrations varied between 4 to 12 minutes.

For all patients treated we have used the dorsal supine position, in which the spine and the vertebral discs do not bear the weight of the body.

Photo 2

Results

After the 10 days of treatment on the PAIN component we have obtained the following results:

Group A = 12 male: kinetic treatment without vibrations, the pain stays the same. With the help of vibrations however it does decrease by 41,1%;

Group B = 12 females: kinetic treatment without vibrations, pain does not decrease. With the help of vibrations however it does decrease by 37%.

From these data we infer the irrefutable efficiency of vibrations in fighting off pain caused by dorsarthrose.

Firstly the decrease of pain is a direct effect of muscle relaxation induced by vibrations, obtained on the paravertebral muscles and secondly is an effect of the restoration of the disc's shape, height and functions under the influence of the same vibrations that are believed to be the main cause of the degenerative diseases of the spine. The discharge of the disc in the position of dorsal supine and application of controlled vibrations exactly under the dorsal spine simultaneously brings both muscle relaxations and positive effects on the disc.

Conclusions

1) The treatment which makes use of mechanical vibrations is effective and may easily be applied to the dorsal spine in its degenerative diseases, both in incipient or advanced stages, having positive effects on rebuilding the shape and height of the disc.

2) In the way they have been used within the experiment, vibrations proved to be benefic and may be applied without risks.

3) The patient is an active part of treatment.

4) This type of treatment may be applied either separately as a single procedure either in combination with kinetic treatment (preferably after it)

5) This treatment has a great therapeutic potential by stopping the evolution of advanced forms of disc attrition and tears. It also proves efficient in the collateral profilaxy of other

rheumatic diseases of the spine, such as the inflammatory forms of rheumatism especially in the periods of calm and in the incipient forms in the first or second stage of evolution.

6) It has a great prophylactic value preventing: partial loss of mobility, joint pain or discomfort.

7) Elderly people give notable results after using this type of treatment; however their results are somewhat more modest than those of young people, which proves that its input is efficient regardless of age.

8) Aside back arthrosis as a form of attrition of the atomophysiologic components of the spine, vibrations may contribute to the prophylaxis of other rheumatic diseases of the spine such as the inflammatory forms of rheumatism especially in the periods of calm and in the incipient forms, in the first or second stage of evolution.

Bibliografie

1. Antonescu, D., Obraşcu, C., Ovezea, A., (1993), *Corectarea coloanei vertebrale.* Editura Medicală. Bucureşti.
2. Bota, A., (2007), *Kinesiologie,* Editura Didactică şi Pedagogică, Bucureşti.
3. Brîndeu, L., Groşanu, I.(1986), *Vibraţii mecanice,* Inst. Polit. "T. Vuia", Timişoara.
4. Chiriac, R., (1996), *Stimularea electrică cu rol analgetic*, Revista de Balneo şi Recuperare Medicală, Nr. 1;2.
5. Ciobanu, V., Stroiescu, I., Urseanu, I., (1991), *Semiologie şi diagnostic în reumatologie*, Editura Medicală, Bucureşti.
6. Denischi, A., şi colab. (1989), *Biomecanica*, Editura Academiei R.S.R. Bucureşti.
7. Harris, C.M., Crede, C.E., (1986), *Şocuri şi vibraţii,* Vol. 1,2,3, Editura, Tehnică, Bucureşti.
8. Marcu, V., Ciobanu, D.I. (2009), *Exerciţiul fizic şi calitatea vieţii, studii şi cercetări,* Editura Universităţii din Oradea.
9. Marcu, V., Pâncotan, V., (2005), *Evaluarea bolnavilor în afecţiunile reumatice degenerative ale coloanei vertebrale,* Editura Universităţii din Oradea.
10.Moraru, Gh., Pâncotan, V., (2008), *Evaluare şi recuperare kinetică în reumatologie,* Editura Universităţii din Oradea.
11. Ometa I., Revista Română de kinetoterapie (Nr. 13/2004), *O armă împotriva durerii la îndemâna kinetoterapeutului*, Editura Universităţii din Oradea.
12. Pâncotan V., Revista Română de kinetoterapie (Nr. 22/2008*), Aspecte esenţiale ale patologiei discului intervertebrat din zona lombară joasă şi profilaxia secundară a afecţiuniloe degenerative prin posturări şi kinetoterapie*, Editura Universităţii din Oradea.
13. Popescu, E., (1997), *Reumatologie ,* Editura Naţional, Bucureşti.
14. Pora, E.,acad. şi colab.(1978), *Dicţionarul sănătăţii*, Editura Albatros, Bucureşti.