Influence of myofascial therapy applied to the cervical region of patients suffering from unilateral spatial neglect and head deviation with respect to the median line

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Abstract- Unilateral spatial neglect has been described as the alteration of the patient’s capacity to receive stimuli coming from the contralateral side relative to the damaged hemisphere. Due to an asymmetrical processing of the information, the gravitational reference becomes displaced producing an alteration of the head’s position with respect to the median line. Considering the relationship between the fascia and the antigravitational system, the technique of myofascial induction is applied.

Objectives: Testing and describing the sensitive, perceptive and motor changes obtained by applying myofascial therapy and comparing it with the patients treated exclusively with conventional physiotherapy (Bobath).

Range: Analytical study, quasi-experimental of basic type. Not random samples (n=8) of patients suffer from ABI and a lesion on the right parietal cortex. Intervention and results on experimental group (n=4). Comparison of variables with respect to control group (n=4).

Results: Significant results are obtained (p<0,05) for the sensitivity variable on the experimental group (p<0,01) and non-conclusive for the rest of the variables.

I. INTRODUCTION

The unilateral spatial neglect syndrome has been described as the alteration of the capacity of the patient for receiving propioceptive, sensitive and motor stimuli of the contralateral side with respect of the injured hemisphere. The main cause is related to a lesion on the right inferior parietal cortex what is involved in elaboration of the body's verticality model, the modulation of the posture and the head's alignment on the vertical axis [1], [2].

Since there is an asymmetrical processing of the information, the gravitational reference becomes displaced and the position of the head is modified with respect to the median line. The neck sensitive receptors and the visual information are in charge of developing the body schema in order to be orientated within the surrounding space [2], [3].

Based on the function of the fascia in proportioning a support of postural control and its close relationship with the gravitational system [4], [5] the technique of myofascial liberation is proposed as a treatment. Considering the global alteration described in ABI patients, the objective of the current study is to test and describe the changes related to sensibility, perception and motor components after the technique application.

II. MATERIAL AND METHODS

A. Design and Subjects

The objective is to verify the effectiveness of a technique applied to a group of patients in a treatment time following the structure (O1-I-O2). Therefore a quasi-experimental analytical study of a basic type is realized, which is developed from February until June 2011. The data is collected on the first two weeks of each of these months (interval of 4 months between measurements).

The selection of the sample was a not randomized group of 8 ABI patients with a lesion on the right hemisphere with body left side affection and unilateral left spatial neglect. The group subjects were under a transdisciplinary neurorehabilitation treatment.

As inclusion criteria it was stabilised the ability to understand the instructions of the tests administrated for the measurements and the ability to answer orally.

Two groups are formed, of 4 patients each:

- Experimental group: patients with conventional physiotherapy (Bobath) treatment, to whom the technique of study is applied weekly.
- Control group: patients being treated exclusively with conventional physiotherapy (Bobath).

While the study is being accomplished, all the patients continue to follow their weekly treatment plan in the therapies in correspondance with the cognitive or motor deficits responsible from their lesion (neuropsychology, speech therapy, occupational therapy and physiotherapy).

The center of treatment and study was the Centro LESCER, Madrid.

B. Measurements carried out

Data of the following variables were collected:

- Perception of the median line and the field of vision: the position of a moving object in the vertical and horizontal axis within a spatial field delimited by four axis.
- Tactile, thermic and pressure sensibility on the dermatomes C2, C3 and C4, based on the ASIA sensory scale [6].
- Active and passive mobility of the neck in flexo- extension, lateralization and rotation movements (goniometric measurement).

C. Gathering and analysis of the data

A template is designed in which the data gathered and the measurements of the variables for each patient are systematized. The values of February and May are compared (Excel).

Once the measurements are collected, the difference between the values obtained in February and May will be treated statistically as indicator of the change.

It should be determined if the differences obtained for each variable show statistical signification. In order to do this, the SPSS software was used to analyze the data. The parametric or not parametric analysis was determined through the verification of normality of the samples: $P > 0.05$ for a level of reliability of 95%.

After that process, the parametric analysis (T-Student) of the difference between the measurements at two levels can be applied:

1. T-Student of two related samples: the data of the variables in February and May (before and after the application of the treatment) are analyzed for the experimental group on the one hand and the control group on the other.
2. T-Student of two independent samples: the differences of the variables between February and May of the control group against the experimental are analyzed.

III. RESULTS

The statistical analysis of the variables as related samples, does not reveal any significant results.

Nevertheless, on the second case, statistical signification is obtained when contrasting the differences between February and May for the control and the experimental group. It is observed that for both of them, the changes in the sensitivity variable are significant ($p<0.05$).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Check the statistical significance</th>
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<tbody>
<tr>
<td></td>
<td>Sig.(bilat.) (T-Student)</td>
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<tr>
<td>Neck’s mobility</td>
<td>Tio. Miofascial 0,155  no Tio. Miofascial 0,378</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>Tio. Miofascial 0,01  no Tio. Miofascial 0,024</td>
</tr>
<tr>
<td>Visual field</td>
<td>Tio. Miofascial 0,266  no Tio. Miofascial 0,30</td>
</tr>
<tr>
<td>Midline</td>
<td>Tio. Miofascial 0,164  no Tio. Miofascial 0,475</td>
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IV. DISCUSSION

There are important lines of research on the fascial tissue in different approaches, such as cell biology, physiology and biomechanics. However, the studies that are developed to demonstrate the evidence based of myofascial induction therapy are scarce. In many cases, the studies are developed by reduced samples or focused on locomotor, nervous, or the circulatory systems.

Therefore, and with the objective of expanding the knowledge on the present technique and its effects on ABI, new studies would be needed in order to clarify its clinical effectiveness.

V. CONCLUSIONS

Since the present study is developed during a very limited period of time, with an unrepresentative sample of patients and it was selected conveniently, it could be concluded that: the results obtained are not determinant for asserting that the intervention has been the object of improvement in the sample, except in the case of sensibility. However, although the patient measurements have improved, this fact cannot be attributed to a specific treatment.

However, nowadays, not many bibliographical references can be found, some of the ideas that could be developed in following studies have been expressed in this study, since it is been possible to prove that the multidisciplinary treatment is determinant in their evolution for the evolution of patients suffering from unilateral spatial neglect.

VI. BIBLIOGRAPHY