

Effect of Manual Acupuncture and Qi Gong on Stress in Fibromyalgia Patients with Fibromyalgia, Case Series

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Abstract: Fibromyalgia is a pathology characterised by chronic widespread pain, predominantly musculoskeletal, being the second most prevalent cause of chronic pain; at the same time, people who suffer from it tend to have greater difficulty in adapting to their environment and traumatic events, and may even have a permanent inability to perform basic activities of daily living, resulting in a greater negative response that is reflected in increased levels of stress. According to epidemiological statistics in Mexico, fibromyalgia is positioned as a high impact public health problem. The present descriptive, experimental, longitudinal and case series design study with a sample of 3 patients, in which the effect of manual acupuncture and Qi Gong on stress in fibromyalgia patients is analysed reflects a decrease in the impact of fibromyalgia assessed by Fibromyalgia Impact Questionnaire (FIQ), decrease in the levels of C-reactive protein (CRP) in respect of The Spanish version of the Cohen Perceived Stress Scale adapted to Mexico shows a decrease in perceived stress levels. Thus, the application of the items Neiguan PC6, Yanglingquan VB34 and Xingjian H2, in a bilateral way for 20 minutes and the incorporation of the practice of the series Ba Duan Jin series of Qi Gong for 30 minutes, during 10 sessions, favour a greater adaptability to stress, improving the quality of life.

Keywords: Fibromyalgia, Stress, Inflammation, Acupuncture, Qi Gong

1. Introduction

Fibromyalgia is a chronic disease without specific treatment, unknown cause with genetic and environmental factors [42], therefore, its diagnosis does not have any study or medical test, due to the uncertain physiopathology that generates alterations or very general physical-biochemical markers [21], presenting a clinical profile with: skeletal muscle pain, cognitive disorders, psychiatric symptoms, headaches, paresthesia, asthenia, sleep disorders, and digestive disorders [2, 9, 20].

The word fibromyalgia comes from the Latin "fibra" (fibrous tissue), from the Greek "mío" (muscles) and from the Greek "algia" (pain); which means: pain in the muscles and fibrous tissue. It is a syndrome characterised by chronic generalised pain, predominantly musculoskeletal being the second most prevalent cause of chronic pain [20, 52].

Because the cause of fibromyalgia is not defined, it is still considered multifactorial, which includes a number of genetic and epigenetic factors. The risk of suffering from fibromyalgia is modulated by multiple causes, among which the following can be highlighted: being a woman, family problems and stress [19, 44, 47].

Its diagnostic evaluation is based on dismissing other pathologies that could explain all the subjective symptoms. As a result, when no disease is confirmed and the generalised pain has been continuous for at least 3 months, leaning towards a diagnosis of fibromyalgia [14, 22, 42]. One of the bases for clinical diagnosis are the criteria of the American College of Rheumatology (ACR) in its 2016 update, which states that patients have generalised pain with central predominance in which painful points are pressed, with a minimum of 11 to 18 painful points being hypersensitive resulting in the hypersensitive pain points, resulting in the severity of the diagnosis [3]. Fibromyalgia is an idiopathic multifaceted

pathology which involves mechanisms of autoimmunity and neuroinflammation, which generate inflammatory periods being favourable to an autoimmune component [10].

Ninety percent of people suffering from this disease suffer from generalised fatigue, 70-80% from sleep disorders and up to 25% from anxiety and depression, the exacerbating factor of all the symptoms is stress, which in turn generates inflammation and this limits the arches of mobility [5]. Fibromyalgia is estimated to affect 2-8% of the general population, with a higher prevalence in women, affecting 1 man for every 9 women, affecting the population between 25 and 50 years old, although the disease can manifest itself at any age, even in childhood [25].

In Mexico, there is a lack of a current epidemiological study that can inform us of the number of people suffering from fibromyalgia, but a study carried out by Guzmán-Silahua S and Cols (2018) mentions that at least 5% of the people attended in primary care services have chronic pain, making it the second most common disease causing chronic pain [18, 20, 34, 52]. The World Health Organisation (WHO) recognises fibromyalgia as a clinical disease and integrates it into the International Classification of Diseases (ICD) and Related Health Problems (ICD), and it is currently included in the classification of pain as: CIE11 MG30.01 Chronic Widespread Pain [7-8, 23, 43].

As a consequence that Fibromyalgia has no cure, the most successful treatment is multidisciplinary, with the aim of mitigating pain, improving sleep quality and restoring mental and physical health, while keeping a good quality of life [20, 33]. The pharmacological treatment consists of: antidepressants, serotonin and norepinephrine inhibitors, neuroleptics, anticonvulsants; and non-pharmacological treatment consists of: psychological therapy, mindfulness, physiotherapy, exercise, acupuncture, among others [15-17, 20, 21, 28, 52].

Acupuncture is currently recognised as part of complementary medicine and its purpose of treatment is to restore the body's energy flow, maintaining longevity and vitality in general, being widely used for the treatment of pain, stress, anxiety and depression; symptoms that patients with fibromyalgia present and that can lead to a great deal of disability related to emotional, affective and psychosocial factors [37, 40, 41].

Within the mechanisms of action of acupuncture, there is scientific evidence which proves that its application is ideal for the reduction of pain, producing a segmental modulation effect in the painful pathway, which benefits the processes of central and peripheral sensitisation caused by chronic pain, as well as regulating the immune system and intervening in the inflammatory response [35].

Evidence from various systematic reviews presumes that Qi Gong may be useful in the management of patients with fibromyalgia, as it has shown significant improvements in aspects such as decreased pain, reduced distress, improved psychological health, mood, emotions, increased quality of sleep and quality of life, with a more optimal development in their activities and even with the activities and even with a

considerable decrease in the intake of drugs. The potential benefit of Qi Gong practice will depend on the frequency of its execution, as well as its durability, so it is necessary to analyse the long-term effects of Qi Gong in more detail [2, 6, 31, 27].

This pathology greatly affects the quality of life of those who suffer from it and although it does not cause the same effects in all people, it becomes a chronic pathology that prevents them from carrying out basic activities; it currently demands great attention in first level consultations and in rheumatology, generating a great impact, being controlled by drugs and complementary therapies [11, 36].

2. Background

Fibromyalgia is a chronic disease of unknown and multifactorial aetiology, that is why treatment is multidimensional and why different areas of health have been interested in conducting research for better clinical interventions, such as acupuncture, which is widely used for the treatment of pain, stress, anxiety and depression; symptoms presented by fibromyalgia patients [12, 38].

Marco Di Carlo, Giacomo Beci and Fausto Salaf conducted a research at the Università Politecnica Delle Marche, where they treated 102 patients with fibromyalgia during eight sessions of manual acupuncture in an eight-week period, obtaining favourable results and demonstrating the efficacy of acupuncture for the treatment of this disease, obtaining a significant reduction in somatic symptoms, neuropathic features, as well as a reduction in the number of sensitive points [13].

Antonio Valera, César Fernández, Marcos José Navarro and Gustavo Plaza in their research titled "Efficacy of dry needling and acupuncture in patients with fibromyalgia", whose purpose was to investigate the efficacy of dry needling in relation to pain, with a short and long term effect, by systematically investigating 25 randomised controlled trials and studies, in which dry needling was found to have more favourable short-term pain outcomes compared to general acupuncture which has a greater effect in the long term [50].

Alcántara Montero, A., and Sánchez Carnerero, C. I. describe a compilation of various systemic reviews in which they found that Qi Gong can be useful in the management of patients with fibromyalgia, as it has shown significant improvements in aspects such as decreased pain, state of distress, improved psychological health, mood, emotions, increased quality of sleep and quality of life, with more optimal development of their activities and even a considerable decrease in the intake of drugs [2].

Jiao, J., Russell, I. J., Wang, W., Wang, J., Yayun, Z., and Jiang, Q., conducted a study of 62 patients previously diagnosed with fibromyalgia, where they performed Qi Gong exercises of the Ba Duan Jin series for one hour, 2 times a week for 12 weeks, measuring the results using the Visual Analogue Scale for Pain (VAS), the Fibromyalgia Impact Questionnaire (FIC), the Multidimensional Assessment of Fatigue (MAF), the Pittsburgh Sleep Quality Index (PSQI), the Beck Depression Inventory (BDI), the Perceived Stress Scale (PSS) and the Tender Point Count (TPC); applied at the

beginning, and after sessions 4, 8 and 12; where the results showed a significant improvement in the decrease of pain, decrease of fatigue resulting in a better mood, more energy, better quality of life, better quality of sleep, decrease of tender points; which suggests that the application of Qi Gong in patients with fibromyalgia as a non-pharmacological treatment is favourable [26].

Sarmento, C., Moon, S., Pfeifer, T., Smirnova, I. V., Colgrove, Y., Lai, S. M., and Liu, W. conducted a study entitled "Therapeutic efficacy of Qi Gong exercise on the main symptoms of fibromyalgia", where there was an experimental group of 20 participants practising Qi Gong and a control group of 20 participants practising only light body movements; performed twice a day independently and once a week as a group; significant results are reflected in terms of decreased pain, fatigue, depression, anxiety and sleep quality compared to the control group [46].

Yeung, A., Quan, X., Boyden, S., & Wang, H. they produced "A Systematic Review and Meta-Analysis of Mindfulness-Based Exercise (Ba Duan Jin) for the relief of musculoskeletal pain and improve the quality of sleep in people with chronic diseases". The study concluded by suggesting that Ba Duan Jin exercises can be an effective option with minimum cost for chronically ill people, helping to reduce musculoskeletal pain and improve the quality of sleep [55].

Derived from the results demonstrating the efficacy of acupuncture and Qi gong practice as independent treatments in the management of fibromyalgia, the present study aims to evaluate the effect of manual acupuncture and Qi gong exercises on the stress associated with Fibromyalgia, giving an integrative and complementary approach to the management of the pathology, in order to reduce stress, inflammation and improve the quality of life of people suffering from this disease; that is the reason for an integral treatment protocol was established based on the application of the Neiguan PC6, Yanglingquan VB34 and Xingjian H2 points bilaterally for 20 minutes, and the incorporation of the practice of the Ba Duan Jin series of Qi Gong for 30 minutes over 10 sessions, in accordance with the literature of Traditional Chinese Medicine.

The research question is: What is the effect of Manual Acupuncture and Qi Gong on stress as a triggering factor in fibromyalgia crises? and having as a hypothesis that the application of the aforementioned treatment will generate a

decrease in inflammation as assessed by the study of C-reactive protein, as well as a decrease in inflammation, by means of the Perceived Stress Scale (PSS) and the items in the Fibromyalgia Impact Questionnaire (FIQ).

3. Methodology

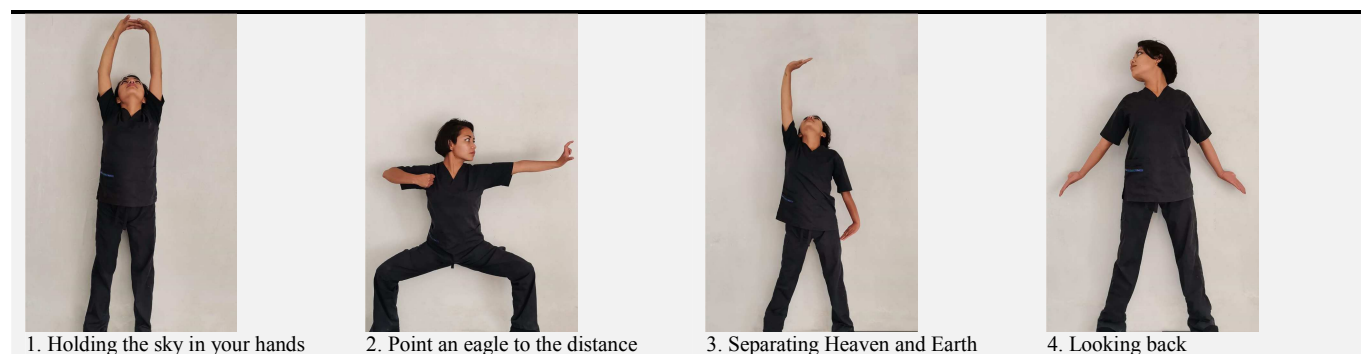
A descriptive, longitudinal and prospective case series study was carried out, in which 3 female patients were included, within a range from 45 to 55 years old, with a clinical diagnosis of fibromyalgia of more than 6 months of evolution, presenting a clinical summary issued by their family doctor, who were selected by convenience according to the inclusion criteria for the research, being active at work and in their families, as well as belonging to the region close to the University Integral Clinic (CIU) of the State University of Toluca Valley, location of the project development.

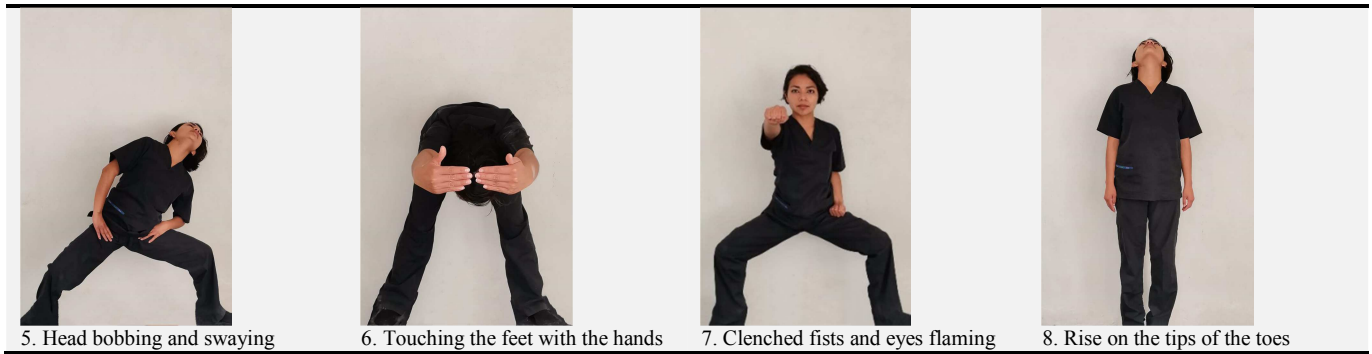
To start with the therapeutic plan, the treatment procedure with manual acupuncture was explained, as well as the sequence of the Qi Gong exercises, followed by the signing of the informed consent form and the taking of the clinical history based on the "Clinical Record" Official Standard 004. At the beginning of each session, vital signs were taken and the following evaluation scales were applied: The Perceived Stress Scale (PS) and Fibromyalgia Impact Questionnaire (FIQ).

Once the patients were positioned in the decubitus supine position on the stretcher, asepsis was performed at the puncture sites, proceeding with the application of acupuncture needles brand "Natural" measuring 1.5 cun (0.25 x 40 mm), made of surgical grade stainless steel, with simple spiral handle with heads, sterilised and with arrowhead; in the points: PC6 Neiguan (tonification) with 45° oblique insertion (in favour of the canal) bilaterally, VB34 Yanglingquan (tonification) with oblique insertion of 80° (in favour of the canal) bilaterally, and H2 Xingjian (dispersion) with oblique insertion of 45° (against the canal) bilaterally; making centripetal rotation stimulation for tonification and centrifugal rotation for dispersion every 5 minutes and for 20 minutes, and then remove the needles and dispose of them in an RPBI container for sharps waste, in accordance with Mexican Official Standard NOM-087-ECOL-SSA1-2002.

After the acupuncture session, each patient returned to perform the Qi Gong exercises, the Ba Duan Jin technique, which consists of 8 exercises for 30 minutes. See table 1.

Table 1. Ba Duan Jin. The eight silk brocades.





Ten sessions were successfully completed, with integrative treatment being applied twice a week, the following studies were carried out (haematic biometry, 6-element blood chemistry, general urine test) at the beginning, in the middle and at the end of the treatment, while for C-reactive protein (C-reactive protein), on the 1st and 5th session.

Data collection was based on the clinical records of each of the patients, which were tabulated and graphed using Microsoft Excel 2013, in order to establish descriptive and comparative statistics, where the different variables were taken into account, the number of sessions, type of scale (EEP and FIQ), scores of the tests derived from each evaluation, markers obtained in the cabinet examinations;

with the aim of evaluating the effect of the implemented therapeutic according to the results obtained.

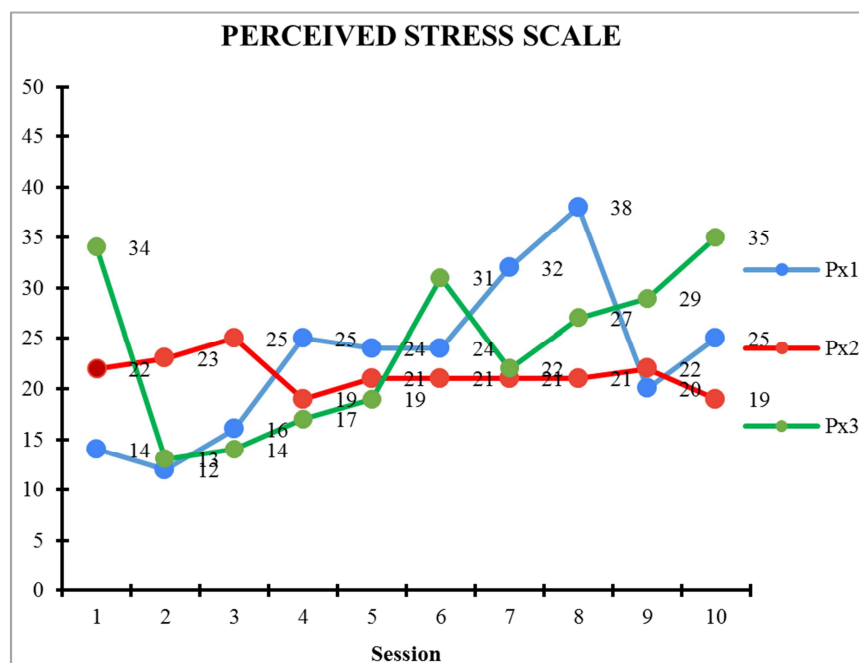
4. Results and Analysis

Of the three patients studied, who satisfactorily completed the treatment sessions, the results of the stress assessment using the Perceived Stress Scale are shown in figure 1, where it can be seen that at the beginning of the treatment there was a decrease in stress, which remained at constant levels, with a peak increase in consultation 6 for patient 3 and in consultation 8 for patient 1, with the figures decreasing in the subsequent consultations more quickly.

Table 2. Table of comparative results of the Perceived Stress Scale.

PERCEIVED STRESS SCALE										
Session	1	2	3	4	5	6	7	8	9	10
Px1	14	12	16	25	24	24	32	38	20	25
Px2	22	23	25	19	21	21	21	21	22	19
Px3	34	13	14	17	19	31	22	27	29	35

Source: Clinical Case File 2022



Source: Clinical Case File 2022

Figure 1. Results of Perceived Stress Scales.

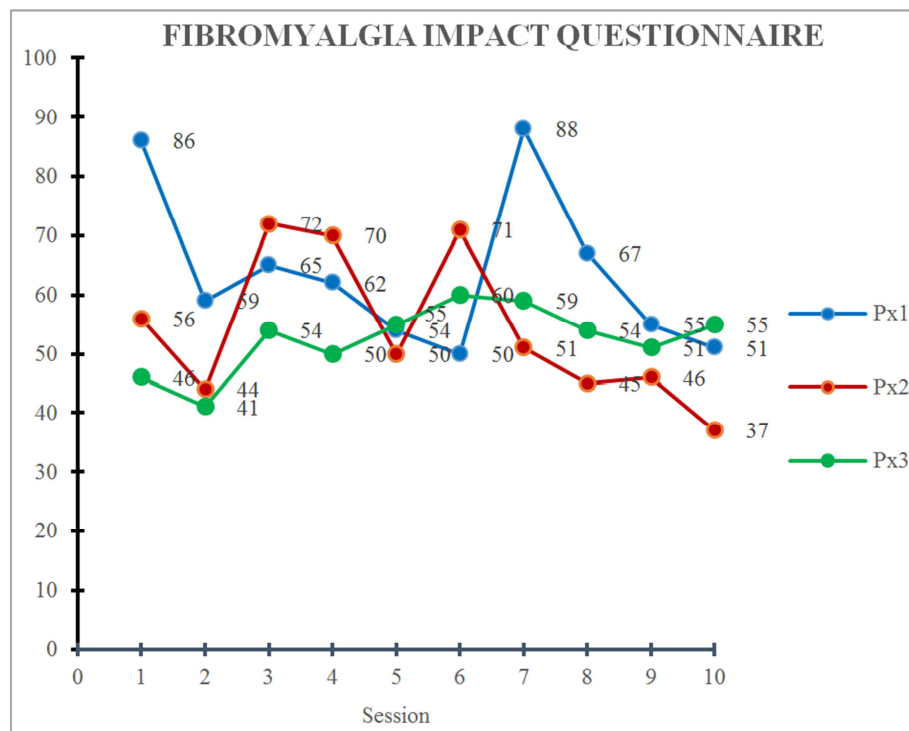
The figure 2 of the assessment of the Fibromyalgia Impact Questionnaire (FIQ) shows the different scores obtained from consultation 1 to consultation 10 for 3 patients, showing a

significant reduction of items for Px1 and Px2, with a considerable increase in quality of life.

Table 3. *Fibromyalgia Impact Questionnaire (FIQ) comparative results table.*

Fibromyalgia Impact Questionnaire										
Sesión	1	2	3	4	5	6	7	8	9	10
Px1	86	59	65	62	54	50	88	67	55	51
Px2	56	44	72	70	50	71	51	45	46	37
Px3	46	41	54	50	55	60	59	54	51	55

Source: Clinical Case File 2022



Source: Clinical Case File 2022

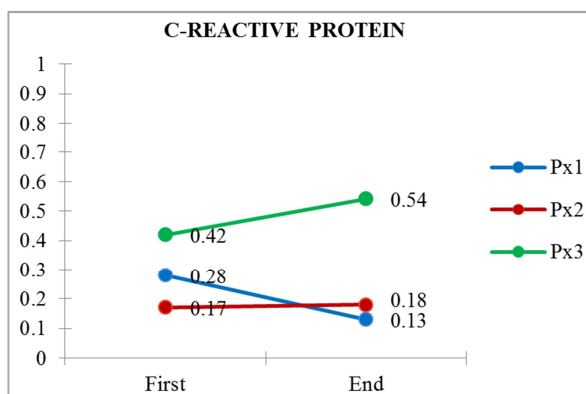
Figure 2. *Fibromyalgia Impact Questionnaire (FIQ) results.*

In figure 3, the results of C-reactive protein in the 3 patients show a decrease only in the first patient; in Px2 and Px3 there was a minimal increase in the levels measured.

Table 4. *Table of comparative C-reactive protein results.*

C-REACTIVE PROTEIN		
	First	End
Px1	0.28	0.13
Px2	0.17	0.18
Px3	0.42	0.54

Source: Clinical Case File 2022



Source: Clinical Case File 2022

Figure 3. *C-reactive protein results.*

5. Conclusions

Because fibromyalgia is a multifactorial pathology with very generalised symptomatology, which has a great impact on all areas of life of the people who suffer from it, it is of utmost importance to add complementary and effective treatments from the beginning, because the quality of life is affected in patients as well as the disproportionate expenditure that this generates in medical care, therefore acupuncture and Qi gong practice can be an alternative in the

treatment or to be used as combined therapies with other treatments [24, 48, 53].

The treatment was applied based on the general clinical picture of the pathology; however, it is important to note that within Traditional Chinese Medicine each treatment is specific to the needs of each patient. This is why a better result is obtained when this point is considered, in addition, beneficial results were observed for each participant, although they differed from the measurements expressed in each of the variables in the evaluations and scales applied [29-30, 39, 54].

The acupoints used during the study: PC6 Neiguan, H2 Xingjian, VB 34 Yanglingquan, are mainly anti-inflammatory, antispasmodic and myorelaxant, whose effects will be best observed in the long term; electrotherapy is suggested, because several studies, such as the one conducted by Hsiao, I.-H., & Lin, demonstrate that the application of electrotherapy is effective in the short term for the reduction of pain in fibromyalgia, generating mechanical and thermal hyperalgesia [1, 4, 56].

The application of this treatment protocol, which includes Qi Gong as a complementary therapy, was highly beneficial for fibromyalgia patients, generating results in joint mobility and improvement in quality of life, which is observed in the FIQ survey for patients 1 and 2 who optimised their functionality, social life and symptomatological relationship; This is also confirmed in a study carried out by Abel Mejías Gil, where the results show that the practice of Qi gong were favourable for the participants [32, 51].

C-reactive protein results assessed at the first and fifth treatment sessions show that while patients were undergoing therapeutic intervention, generalised inflammation tended to remain within similar ranges, however, taking into account the context of interpersonal development in patients daily lives as primary caregivers of the sick, the increased demands of work, as well as the emotional factors secondary to social coexistence, leads to a metabolic imbalance which in turn leads to results above the initial levels.

In the perceived stress scale, a significant decrease in stress levels can be observed in patient 1 during the study, although they were under external exacerbating factors such as family stress, work stress and personal stress during the study period. There is also a close relationship between symptomatology and emotional processes, as it is shown by the study "Negative Thoughts and Stress associated with Serotonin Receptor 5HT1a in Women with Fibromyalgia" proving that negative thoughts and stress are highly correlated variants in fibromyalgia patients that generate a greater impact on symptomatology [45].

The production of stress activates the secretion and increase of glucocorticoids, in quantity and frequency, returning to normal parameters after the stressor disappears or the organism adapts to it.

On the other hand, if the person does not adapt, the balance is not restored, altering the regulation capacity of the Hypothalamus-Pituitary-Adrenal axis and entering a pathological cycle of cortisol production and exhaustion,

resulting in chronic stress. Martínez-Lavín proposes the theory that fibromyalgia presents an alteration of the adrenergic system having a hyperactivity that causes abnormal connections of the sympathetic nervous system in relation to nociceptive fibres [3, 49].

In addition to the results of the laboratory studies carried out on the patients at the beginning and end of the treatment, a clinical significance can be observed in terms of the decrease in triglycerides in px1, starting at 164mg/dL and concluding the 5th session with 100mg/dL. At px2, there is a decrease in glucose, stabilising at 80mg/dL, cholesterol levels decreased from 138mg/dL to 118mg/dL and triglycerides from 183mg/dL to 133mg/dL at her second sample collection.

In px3 leukocyte levels decreased from $6.89 \cdot 10^3/\text{mm}^3$ to $5.0 \cdot 10^3/\text{mm}^3$ and glucose levels stabilised at 86mg/dL. with an increase in cholesterol from 269mg/dL to 283mg/dL and in triglycerides from 219mg/dL to 230mg/dL.

6. Limitations

During the implementation of the study, there were limitations in terms of time and resources, so it was not possible to apply a greater number of sessions or for them to be continuous for a longer period, as well as to include more patients in the sample.

7. Recommendations

According to the results obtained in this research, the following suggestions are made: to carry out comparative studies with other acupuncture points, increase the number of sessions to be treated, as well as the duration of the treatment and perform the Qi Gong exercises daily. The results obtained support the application of the treatments, giving greater openness to deepen the different techniques used and increase the sample size. To continue to carry out research studies on these therapies, both acupuncture and Qi Gong, in an integrative and comparative way in patients with fibromyalgia.

To compare the Ba Duan Jin series of Qi Gong exercises with other Qi Gong exercise series and to establish whether they have the same effect, the same efficacy or which one is more suitable for fibromyalgia patients.

Conflicts of Interest

The authors declare no conflicts of interest.

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