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DRY NEEDLING EFFECT ON THE FUNCTIONAL CAPACITY IMPROVEMENT IN PATIENTS WITH LOW BACK PAIN

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ABSTRACT

Backaches constitutes one of the most common complaints in the adult population, impairing about 60% to 80% of the people at some moment in their lives. Various factors intervene in its occurrence, being able to have specific causes or not. In the conservative treatment Dry Needling has been gaining space as a therapeutic alternative. The goal of the study was to measure the effect of Dry Needling on the pain and functionality of people with low back pain. Participated in this study 20 individuals of both sexes, aged between 18 and 56 years old divided in two groups: Experimental Group and Control Group. Both groups received ten sessions of conventional physiotherapy, but to the Experimental Group were added four sessions of Dry Needling. The Visual Analog Scale was used to measure lumbar pain and the Rolland-Morris Questionnaire was used to evaluate the functionality. The results demonstrated that both treatments presented positive effects regarding pain and functionality, but it was identified that in the Experimental Group the improvement of pain levels was statistically more meaningful. We conclude that the addition of Dry Needling had positive effects on the pain and functionality of people with low back pain, besides considerably increasing the effect of the standard intervention in these individuals.

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INTRODUCTION

Low back pain is marked as an algic condition situated in the lumbar spine, that may or may not present muscle rigidity and fatigue. The pain condition can be local or radiate to the inferior limbs, and about 60-80% of adults may be affected at some moment in their life, presenting a constant and common problem in society. It presents multifactorial etiology being linked with individual and professional factors, with specific

cause or not (CORREIA *et al.*, 2015 and BORTOLATTO *et al.*, 2016). The back pain constitutes one of the most common complaints in the adult population, leading to a high rate of work leave, search for illness benefits and disability pensions in Brazil. (MALTA *et al.*, 2017 e ARINS *et al.*, 2016). Authors state that low back pain causes more disability than any other condition (SCHNELLE *et al.*, 2017). Such patterns of incapacity comes with the fact that individuals with low back pain tend to restrict certain movements or postures because of the pain. This ends up turning it impossible for primordial functions, what makes the individual need help

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from third parties, which ends up affecting not only the physical, but also their social life and life quality (LOPES and CASA JUNIOR, 2014). The low back pain treatment is still very complex and discussed, because several therapies are used to control the condition. In the conservative treatment the Physiotherapy is essential, once its objective is not only to create ways to recover the physical aspects, but mainly to promote the functional recovery of these subjects, enabling their precocious return to daily and work activities. It acts with several means of treatments or specific techniques, like electrotherapy, hydrotherapy and kinesiotherapy, which directly act on pain and functionality and present excellent results, besides bringing new techniques and being in constant therapeutic evolution (ALVES *et al.*, 2014 and CORRÊA *et al.*, 2015). One of the techniques that is gaining ground is Dry Needling, also known as “Aguilhamento Seco”, because it doesn't involve any kind of conjugal application with any substance in the body. It is a minimally invasive procedure where a thin, filiform needle is inserted into a trigger point to promote tissue disruption to produce an immediate nerve response directed to that place. The Dry Needling has as key hypothesis the reduction of pain levels and spontaneous muscular activation through various mechanisms. It appears to be a highly effective technique in relieving chronic pain, besides promoting skeletal muscle relaxation, extended flexibility and therefore improved functionality (Gattie *et al.*, 2017 and MAHMOUDZADEH *et al.*, 2016). In this context, this study looks for evaluating the effect of Dry Needling on the pain and functionality of people with low back pain, aiming to increase the knowledge of professionals in the area of Orthopedics and Traumatology, as well as to enable society a new treatment alternative, promoting pain improvement, functional earnings and the quality of life improvement of the general population.

MATERIALS AND METHODS

It is an experimental, descriptive and analytical study, with a quantitative approach, performed from January to April 2018. It was designed in a private clinic in the city of Vitória da Conquista (BA). The study sample was defined by convenience, including in the study twenty patients diagnosed with low back pain aged over 18 years, of both genders and who never had been treated with Dry Needling. There were excluded participants who presented the following criteria: (1) complementary treatments for low back pain outside the clinic, (2) continuous use of medications to relieve low back pain, and (3) any lumbar spine surgical intervention. Firstly, each participant was submitted to an evaluation to confirm their eligibility and to obtain the sociodemographic data. To evaluate functional capacity it was applied the Rolland-Morris Questionnaire composed by 24 questions related to the aspects that involve the activities of the daily life, function and pain (ROLLAND and MORRIS, 1983). There are simple and objective questions, given a score of 0 if the patient doesn't agree with the statement and 1 if the patient agrees. The score is given by the addition of the results of each question, varying from 0 to 24 points and has as a cut-off point the score 14, where values above this score characterize disability, 24 points classifies the individual with major disability and 0 as absence of disability (BENTO *et al.*, 2009). To classify the pain it was applied The Analog Visual Scale. This scale goal is to quantify the intensity of pain subjectively, and the classification is given by a score varying from 0 to 10, referred in a line with two extremities, where 0 classifies absence of pain and 10 as

the worst pain that the individual can imagine. The evaluation is done by showing the subject the image of the scale and asking him to score the degree of pain that he presents at the moment (MAARTINEZ *et al.*, 2011). After the evaluation, the participants were randomly shared into two sample groups, one was the Control Group, and the other the Experimental Group composed by ten participants in each group. The Control group patients' were submitted to 10 sessions of Conventional Physiotherapy, with sessions of one hour each using the following resources: TENS application in the lumbar region, McKenzie exercises, myofascial release and stretching of posterior and iliopsoas muscles, sciatic nerve automation, segmental stabilization exercises, progressing according to the evolution of the patient, as well as guidelines regarding the practice of physical activity and avoiding rest. Patients from the Experimental Group were submitted to 10 sessions of Conventional Physiotherapy with the same resources of the Control Group, but four of the ten sessions were linked to the application of Dry Needling in an intercalated way, with intervals of approximately 48 hours between the applications. The participants submitted to Dry Needling were informed beforehand about the application of the technique.

Firstly it was performed the local hygiene with cotton and alcohol 70%, afterward there were a mapping of the pain points in the lumbar and pelvic region with Rollet tweezers and at each point found the needles were applied, keeping them for five minutes at each point. When finishing the intervention, all participants were reevaluated 24 hours after the last session, where they were asked to evaluate their pain intensity at that time through the Visual Analogue Scale and to answer again to the Rolland-Morris Questionnaire to detect changes in functionality after intervention. The data were tabulated and processed by the Statistical Package for Social Sciences - SPSS 22.0 Software for Windows. The were applied the tests: T-Student-paired to obtain a correlation between pre and post intervention means for both the Visual Analogue Scale and Roland-Morris, the Kruskal-Wallis test in order to verify whether the reduction of pain and physical disability obtained by the procedures were the same and the T Student test for independent samples to check where the difference between the techniques was. The research was approved by the Research Ethics Committee (CEP) of the Northeast Independent College (FAINOR), meeting the Resolution 466/12 of the National Health Council, according to the opinion 2,370,974. All participants signed an Informed Consent Form that was informed before participation.

RESULTS

From the results presented in table 1 it is possible to see a slight predominance of female participants (55%), classified in the age group of 31 to 45 years (55%) and non-practitioners of physical activity (65%). It is also noticed that the majority of the investigated population feels pain with a maximum duration of 6 months (70%). Table 2 enables to evaluate the presence of pain by Visual Analogue Scale and the level of functional repercussion in patients before and after treatment. It was possible to check that both treatments presented positive effects. Relating to pain, subjects were relocated to more satisfactory levels, however a significant difference was observed in the treatment with Dry Needling, since most of the individuals were classified as absence of pain. It is also seen that 100% of the sample were classified as absence of disability in both treatments.

Table 1. Sociodemographic characteristics of the sample. Vitória da Conquista - BA, 2018

Variables	% answers	n	%
Age Range	100		
From 18 to 30 years		4	20,0
From 31 to 45 years		11	55,0
From 46 to 60 years		5	25,0
Sex	100		
Female		11	55,0
Male		9	45,0
Practices physical activity	100		
No		13	65,0
Yes		7	35,0
Time that feels pain	100		
Until 6 months		14	70,0
From 6 months to 1 year		1	5,0
From 1 to 2 years		4	20,0
Above 2 years		1	5,0

Table 2. Pain Level and functionality before and after intervention. Vitória da Conquista - BA, 2018

Variables	Conventional n (%)		Dry Needling n (%)	
	Before	After	Before	After
Pain Level - EVA ¹				
Absence of pain	-	-	-	6 (60%)
Mild	-	1 (10%)	-	4 (40%)
Moderate	3 (30%)	8 (80%)	8 (80%)	-
Intense	7 (70%)	1 (10%)	2 (20%)	-
Roland Morris ²				
Absence of Disability	2 (20%)	10 (100%)	5 (50%)	10 (100%)
Physical Disability	8 (80%)	-	5 (50%)	-

Source: Research Data. ¹Visual Analog Scale; ²The Roland-Morris Disability Questionnaire

Table 3. Correlation between pain averages and pre and post intervention functionality. Vitória da Conquista - BA, 2018

Groups (n = 10)	Mi ¹ ± DP ³	Md ² ± DP ³	p*
Pain Level - EVA ⁴			
Conventional	7,8 ± 1,54	4,70 ± 1,82	0,064
Dry Needling	6,50 ± 1,35	0,9 ± 1,19	0,018
Functionality- Roland Morris ⁵			
Conventional	16,10 ± 2,84	10,10 ± 2,28	0,024
Dry Needling	13,80 ± 3,32	2,80 ± 1,54	0,022

Source: Research Data. * T-Student Test; ¹ Mean before procedure; ² Mean after procedure; ³Standard Deviation; ⁴ Visual Analog Scale; ⁵ The Roland-Morris Disability Questionnaire.

Examining the association between the treatment and the pain reduction and the functionality based on the criteria of the variables means, it is possible to assert that for the functionality both treatments were associated with the improvement. Nevertheless, when evaluating the level of pain perception, it is stated that only the use of Dry Needling has been linked to level reduction (Table 3).

DISCUSSION

The objective of this study was to evaluate the effects of Dry Needling on the pain and functionality of people with low back pain. From the results achieved, it is possible to validate the efficacy of the technique in both the observed aspects, in addition to affirm its superiority in the improvement of the low back pain when compared to the conventional physiotherapy. It was observed in the sample a higher predominance of females, corroborating with the study by Ferreira and Pereira (2016) that when studying the role of the family in the relation between functional disability and quality of life in patients with low back pain, the great majority were female (72.2%). Despite low back pain being a common musculoskeletal disorder in the adult population, there is a higher prevalence in women (BORTOLATTO *et al.*, 2016). This fact corroborates the results of studies conducted in Brazil (ARINS *et al.*, 2016) and in several countries of the world, which associate the

prevalence with hormonal and reproductive factors (IGUTI *et al.*, 2015), and clarify that this fact is related to sociocultural issues, which require more of women in domestic and work chores, as well as anatomical and functional differences when comparing them to men, which makes them more vulnerable to the development of chronic diseases (ARINS *et al.*, 2016). In relation to the practice of physical activity, only 35% keep this habit, classifying most of the participants of this research as non-practitioners of physical activity. Similar data were found in the study by Mascarenhas and Santos (2011), where only 35.3% of individuals with low back pain were physically active. Physical inactivity is one of the aspects that may be associated with the emergence of low back pain which directly influences the functionality. However, the practice of physical activity assures the reduction of pain levels in these subjects (MARTINS and LONGEN, 2017). Data from the World Health Organization points to low back pain as the leading cause of physical and functional disability in the world, becoming a major cause of early retirement in Brazil (WENDT *et al.*, 2017). In this study, in both groups it was possible to notice a high level of functional disability linked to low back pain, before the intervention. Figueiredo *et al.* (2013) also identified a relevant connection between low back pain and disability. This fact happens because the subjects in this clinical condition limit local movement because of the exacerbated fear of pain increase, which results in the decrease

of the functions, leading to incapacity (LOPES and CASA JUNIOR, 2014). When evaluating the effects of the pain techniques, it was noticed that both of them caused the subjects to be relocated to more satisfactory levels, besides having a reduction in pain means. This discovery strengthens the evidence that physical therapy is one of the most efficient methods for the treatment of pain and its functional changes influencing several body mechanisms, generating positive effects in the treatment of patients with a algic picture (SANTOS *et al.* 2017).

It is worth highlighting that in Experimental Group, the changes found deserved a greater highlight, since 60% of the individuals left a moderate or intense pain level to total absence of pain, while in the Control Group no individual had pain absence, and only 1 of them had mild pain. This discovery is reinforced by noticing that statistically when the reduction in pain means was evaluated, only the Experimental Group presented a significant reduction ($p = 0.018$). This phenomenon may be explained by the mechanism generated with the application of Dry Needling needles, which fastly penetrates the pain control center, stimulating a large number of afferent sensory nerve fibers, blocking the pain information generated in the nociceptor of a painful point in a quickly and effective way. (LIU *et al.*, 2018). It is well known that the primary focus of the application of dry needling is to create a local contraction response, in a way that the trigger-point inhibition occurs, through the mechanical block in the region where there are found the various sensitized nociceptors. The insertion of the needle into the superficial layers of the skin causes responses that activate the means of pain control at the level of the posterior horn of the spinal cord, which promotes fast answers (Perez-Palomares *et al.*, 2017). In a study performed with 34 individuals, the results showed that a program consisting of Dry Needling and classical massage proved to be superior to a conventional physiotherapy program for the treatment of low back pain (TUZUN *et al.*, 2017). Though this study differs from the present study in terms of methods and procedures, the effects of Dry Needling on pain intensity were similar.

Regarding functionality, it was identified that 100% of both group sample presented absence of incapacity at the end of the intervention, besides having a reduction in the averages of the questionnaires statistically significant. Pain intensity is a decisive factor in the functional consequences that result from low back pain (WENDT *et al.*, 2017). When reducing the pain of a subject, consequently it causes an improvement in his functionality. Therefore, it is important to relate the enhancement of the function with the treatment of pain, even if the pain is not totally exterminated (PINHEIRO *et al.*, 2011). In this way, it is explained the fact that all the individuals presented absence of incapacity, even those that still had some pain sign. Despite being scarce the research comparing the use of conventional physiotherapy with Dry Needling, it is noticed that the results found in the present study corroborate with the present literature, when affirming that the additional application of the needling highly increases the effect of the standard intervention. Mahmoudzadeh *et al.* (2016) when comparing a group of standard physical therapy and another group of standard physical therapy with Dry Needling, determined that the decrease in pain levels and the disability score were significantly higher in the experimental group. The same way, Liu *et al.* (2018) in a systematic review that the application of needles combined with other treatments came

out to be significantly superior to the application of needles alone in the improvement of pain intensity. In the clinical practice, the application of Dry Needling for low back pain treatment is frequently linked with conventional physiotherapy protocols. When is applied to the correct patients, it becomes strongly effective in pain reduction, enabling the application of other physiotherapy techniques complementary to the treatment maximizing the functional results and reducing the patient's disability (GATTIE *et al.*, 2017). The main restriction found in this study was in the reduced sample number, however from the results and the analysis performed and the agreement with the literature, it is noticed that the study's data are real and plausible, and can be overcome for future investigations.

Conclusion

According to the results, we can determine that the addition of Dry Needling had positive effects on the pain and functionality of people with low back pain, validating its efficiency in improving these symptoms and assuring their benefits in enhancing the results achieved when combined with conventional physiotherapy.

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