120 - ANALYSIS AND COMPARISON OF CURRENT DIADYNAMICS ISOLATED AND THE ASSOCIATION WITH IONTOPHORESIS, APPLIED IN FEMALE STUDENTS WITH LOW-BACK-PAIN

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INTRODUCTION

The iontophoresis is the transmission of ions through the intact skin, with introduction of substances for therapeutic purposes, using a current and continuing polarization. The effects are dependent on the actions of the substances used [12]. These typically consist of anti-inflammatory substances, local anesthetics, as well as several other agents [9.10]. The ions penetrate to push the same pole and the opposite pole of attraction; they should have the same signal used to signal the pole and may be in solution, gel or ointment [11.12]. This is technique of topical application, which can generate its local effects without possible and perhaps undesirable systemic changes [8.12].

The use of iontophoresis provides benefits like processing of areas well defined by non-invasive technique, which apart from being painless, reduces the risk of infection and the maximum time of application allows the work to other resources [9.10]. Thus providing an alternative to enhance the transfer of such substances, ensuring higher levels of concentration to not passive diffusion facilitated by electric current, sufficient to trigger the desired therapeutic effect [15].

The dexamethasone is a moderately potent steroid. The main effect of this product is promoted profound change in lymphocyte immune response, due to anti-inflammatory and immunosuppressive action, which may prevent or suppress inflammatory processes of various natures. It is usually formulated in creams, ointments and gels at a concentration of 0.1%. In topical administration must absorption site and consequently found systemic effects [1,2].

The current Diadynamics are associated with a current of low frequency, according to their nature and a group of current galvanic-faradic (continuous/alternate), produce surface actions and preserve polar action, which is itself the galvanic essential component for iontophoresis, producing effects such as analgesia and hyperemia may double the rate of tissue resorption [1,6,11,12]. Showing frequency modulations: Fixed diphasic, Single Fixed, Short Period, Long Time and Rhythm syncope, which will produce specific type of feeling in the dosage used [1.12].

The lumbar segment is a frequent cause of pain; half of the world's population suffers from back pain at least once in their lifetime [3]. The back pain has multiple relationships, Toscano and Egypto [16], emphasize the weakness of paravertebral muscles, especially, abdominal, in low levels of flexibility at the lumbar region and the muscle groups on the back of the thigh, as well as in physical activities of contact and impact.

So low back pain consists of pain and generally, inability to work and move [5, 14, 16].

Whereas the use of chains Diadynamics has been left to one side and the few studies on application of iontophoresis in low back pain, it was the objective of this study examining the effectiveness of current Diadynamics in the controlling of the pain of female students, and compare with the use of the same applied to iontophoresis with dexamethasone 0.1%.

MATERIALS AND METHODS

This study was composed by students of physiotherapy at the State University of Northern Parana - UENP campus FAEFIJA Jacarezinho, females aged between 18 and 26 years old, who complained about back pain for more than 1 year. The study was conducted at the clinic of physiotherapy Alfredo Franco Ayub, located on the properties of FAEFIJA.

The participating patients were initially evaluated, where was obtained personal data and historical, physical examination and special tests to confirm the symptoms. Along the initial assessment was applied a visual scale of pain intensity, which was reapplied after the end of treatment and compared with the initial data, which pointed out the patients from zero to ten, where zero indicating no pain and ten the worse pain [1].

The patients were divided randomly into two groups.

Group 1 was treated with a protocol of Current Diadynamics and group 2 with a protocol of diadynamics currents associated with iontophoresis, to that was used dexamethasone gel to 0.1%, manipulated into a commercial pharmacy at the city of Jacarezinho-PR.

A small amount of dexamethasone, which has negative polarity, was applied to the skin, which would be above the negative electrode [1,2].

We used sponges saturated in warm water and silicone carbon electrodes placed on top of sponges, fixed with duct tape, the electrodes did not have direct contact with skin.

The equipment used for applying the current ENDOFHASYS was the USS-0503 mark of KLD Biosistemas. The intensity of this was in accordance with the subjective sensation of the patient, where he was instructed to only feel tingling [1.12].

The protocol of treatment was carried out with Machado and Agne [1.12], as follows:

Group 1 (Current Diadynamic isolated); Patient's position: In prone position with a pillow in the abdomen.

Execution: Undress and examine the area to be treated, soak the sponges and place the electrodes (paravertebral) above the saturated sponges. Modular unit of the currents in Diadynamics diphasic Fixed (DF) for 4 minutes, reducing the intensity to zero. Saturate the sponge again; change the polarity of the electrodes and the modular unit in a short period (CP) for 2 minutes. After the intensity decrease to zero and change the way for long period (LP) for another 2 minutes, reset the intensity, turn off the unit, clean and examine the treated area.

Group 2 (Current Diadynamics associated with iontophoresis with dexamethasone 0.1%);

Patient's position: In prone position with pillow in the abdomen.

Execution: Undress and examine the area to be treated, putting a layer of drug (dexamethasone 0.1% gel) on the skin (below the negative electrode), soak the sponges and place the electrodes (paravertebral) above the saturated sponges. Modular unit of the currents in Diadynamics diphasic Fixed (DF) for 4 minutes, reducing the intensity to zero, clearing the skin.

Apply a layer of the drug (below the negative electrode), soak the sponge again, and change the polarity of the electrodes and the modular unit in a short period (CP) for 2 minutes. After the intensity decrease to zero and change the way for long period (LP) for another 2 minutes, reset the intensity, turn off the unit, clean and examine the area treated.

The protocol was applied for seven consecutive sessions, held from Monday to Friday with an interval of a weekend.

The participants signed a free and informed consent, which was full implementation of the search. We used the following criteria for inclusion: low back pain for more than a year, normal sensitivity (tested in the evaluation) and not be doing any other kind of physical treatment during the research. The criteria for exclusion were refusing treatment, changes in skin spot in the application of electrodes, missing on two consecutive days and allergic reactions to the drug.

The data were statistically analyzed by the table and graph of the program Microsoft Excel 2003, and for the variables of pain and different treatments were used non-parametric tests of Wilcoxon and test U. from Mann Whitney, where p = 0.05 determining significance, through the SPSS for Windows 13.0. The treatment of scores was descriptive.

RESULTS

The sample consisted of 12 participants, which received 6 of the protocol Diadynamics Current (GROUP 1) and 6 of the protocol Diadynamics currents associated with iontophoresis with dexamethasone 0.1% (Group 2).

After analyzing the data submitted by the sample, was built below the statistical table that tells the index of pain in Groups 1 and 2 before and after treatment for their patients and the average pain before and after the treatment for both groups.

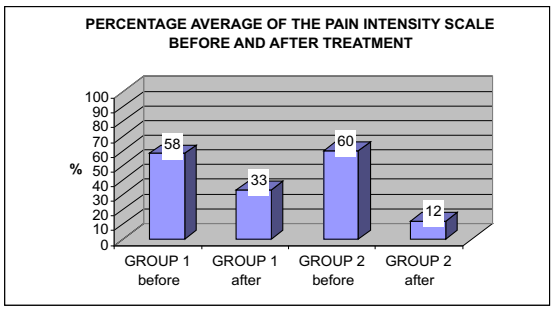
CONTENTS OF PAIN OF GROUPS 1 AND 2 BEFORE AND AFTER TREATMENT

	GROUP 1		GROUP 2	
Patients	Before	After	Before	After
1	5	2	5	3
2	6	3	7	0
3	5	3	6	2
4	7	4	6	1
5	5	3	8	1
6	7	5	4	0
Average:	5,8	3,3	6	1,2

Through the Test U of Mann-Whitney, analyzing the rates of pain in both groups before treatment, we observed no significant result, p = 0.80. After treatment, comparing the two groups, the result proved to be significant, p = 0.01.

Calculating each group separately before and after treatment, through the test of the signs of Wilcoxon, one can see an improvement in the two treatments, GROUP 1 p = 0.02 and Group 2 p = 0.02.

Continuing the analysis of the data presented in this study, the chart below summarizes well the results of the two treatments, showing the average scale of pain intensity before and after treatment in percentage units.



It is visible the improvement in the level of pain of patients before and after the two treatments. In GROUP 1 was reduced by 25%. In GROUP 2 the improvement was even more significant, 48%, almost double of the GROUP 1 results.

Comparing the two treatments the improvement in the treatment of GROUP 2 in relation to the GROUP 1 is 21%, observing a trend of greater effectiveness for the treatment of GROUP 2.

DISCUSSION

The results obtained in this research can be shown that both techniques were effective in the treatment of low back pain, showing a greater propensity on efficacy in the treatment of currents associated with iontophoresis with dexamethasone 0.1%.

Carvalho et al [6] in his study, found no significant differences compared the current Diadynamics isolated and association with the iontophoresis with hydrocortisone 1% in the treatment of low back pain.

The Diadynamics current despite being left a little apart, perhaps because they are of great feeling for the patient because of its component galvanic, effect of analgesia and hyperemia, presented different types of modulations, each of which offers information, and sensations different effects. The hyperemia of the current occurs by stimulation of the sympathetic nerve fibers of skeletal muscles, promoting the release of histamine, easing the transition from liquid to the surface tissues and producing vasodilation. The component analgesic is the action on the nerve fibers, reducing the threshold of excitability, breaking the vicious cycle: pain - contracture - vasoconstriction - pain, producing relaxation, vasodilation and analgesia [1.12].

As a result of electrorepulse, the continuous current was elected to the preferred source for the application of iontophoresis, since the flow of electrons is unidirectional and constant during the implementation period. Clinically, an ion estimated penetration can be controlled by the manipulation of the rational parameters of time and magnitude, considering dose of security and respect 5mA maximum of 100 Mamina [15].

There is a close relationship between the inflammatory process and context of pain in patients with low back pain due to mechanical causes [6].

An imbalance of mechanical structures of the spine acts as a harmful factor on themselves. The muscle-joint structures are responsible for the antagonism of mechanical actions of the column: axis of sustaining the body and at the same time, axis of movement. The lack or over-exertion in these structures easily entail mechanical damage to the human being in its components bone, muscle and articulation [5,14,16].

Women have greater risk and greater severity of many pain clinical conditions. In addition, presents some anatomical

and functional characteristics (lower stature, less muscle mass, lower bone mass, joints weaker and less suited to heavy physical effort, greater weight of fat) that can work for the emergence of back pain [4].

Therefore the Iontophoresis currents associated with the Diadynamics, applied with an anti-inflammatory drug, especially the 0.1% dexamethasone, can bring satisfactory results in the treatment of back pain.

CONCLUSION

From the results we can conclude that both the current Diadynamics alone, as associated with iontophoresis with dexamethasone 0.1% had significant improvement of low back pain in female students, with larger trend of effectiveness of the current associated with iontophoresis. Further studies are suggested for further clarification of the techniques used, and about different situations involving pain, and other substances and types of chains for the use of iontophoresis.

Keywords: Diadynamics Current, Iontophoresis, lumbago.

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ANALYSIS AND COMPARISON OF CURRENT DIADYNAMICS ISOLATED AND THE ASSOCIATION WITH IONTOPHORESIS, APPLIED IN FEMALE STUDENTS WITH LOW-BACK-PAIN

ABSTRACT

The iontophoresis is a noninvasive technique of administering drugs in ionic form to the body, which uses electric current, with the greatest satisfaction when compared to passive percutaneous absorption. The current Diadynamics have analgesic effects and galvanic components essential to the use of iontophoresis. The low-back-pain, increasingly present in the world brings associations of inflammatory processes and context about pain because of several causes. The research aimed to analyze and compare the effects of currents Diadynamics isolated and associated with iontophoresis in low back pain of female students. 12 females students aged between 18 and 26 years participated in the survey complaining of back pain for more than a year. Participants were initially assessed to various criteria, next to which was enforced a scale of pain intensity and then reapplied and compared with the initial results. The sample was divided randomly into two groups, Group 1 received the memorandum of Current Diadynamics alone, Group 2 Current Diadynamics associated with iontophoresis with dexamethasone 0.1%, and held seven sessions. The equipment used for applying the current was the USS ENDOFHASYS-0503, mark KLD Biosistemas. The intensity of this was in accordance with the patient's subjective feeling. The data were statistically analyzed by the program Microsoft Excel 2003, and for variables, non-parametric tests for signs of Wilcoxon test and U. of Mann Whitney, where p = 0.05 determining significance, from the program SPSS for Windows 13.0. The results were significant for both treatments, GROUP 1 p = 0.02 and Group 2 p = 0.02, noting an improvement of 21% of treatment group 2 than group 1. It appears that both the current Diadynamics alone, as associated with iontophoresis brought significant improvement in back pain for female students.

Keywords: Diadynamics Current, Iontophoresis, lumbago.

ANALYZE ET LA COMPARAISON DE L'ACTUALITé DIADYNAMIQUE ISOLER ET DE LA IONOPHORÈSE, APPLIQUéE DANS LA LOMBALGIE éTUDIANTS DE SEXE FéMININ

RÉSUMÉ

Ionophorèse est une technique non invasive de l'administration de médicaments en forme ionique à l'organisme, qui fait appel à du courant électrique, avec la plus immense satisfaction par rapport au passif d'absorption percutanée. L'actuel Diadynamique ont des effets analgésiques et galvanique éléments nécessaires à l'usage de la ionophorèse. Le lumbago, de plus en plus présente dans le monde apporte des associations de processus inflammatoires et le contexte de douleur parce que plusieurs causes. Les travaux de recherche visant à analysent et comparent les effets de courants Diadynamique isolées et dans

le bas du dos douleur associée à la ionophorèse des étudiants étaient des femmes. 12 étudiants ont participé à l'enquête étaient des femmes âgées entre 18 et 26 ans se plaignant de maux de dos depuis plus d'un an. Les participants ont d'abord été évalué à différents critères, à côté de laquelle est appliquée une échelle d'intensité de la douleur et puis de nouveau et comparé avec les premiers résultats. L'échantillon a été divisé au hasard en deux groupes: Groupe 1 a reçu le mémorandum de l'état actuel Diadynamique seul, groupe 2, en cours Diadynamique associés à ionophorèse avec la dexaméthasone 0,1%, et a tenu sept sessions. Le matériel utilisé pour l'application de la présente a été l'USS ENDOFHASYS-0503, la marque KLD Biosistemas. L'intensité de cette était en conformité avec le patient du sentiment subjectif. Les données ont été analysées statistiquement par le logiciel Microsoft Excel 2003, et des variables, de la non-paramétrique de tests pour détecter des signes de Wilcoxon test et U. l'Mann Whitney, où p = 0,05 importance de la détermination de SPSS pour Windows 13.0. Les résultats ont été importantes pour les deux traitements, GROUPE 1 p = 0,02 et p 2 = 0,02, en notant une amélioration de 21% du traitement que le groupe 2 groupe 1. Il semble que l'actuel Diadynamique seul, associé avec l'ionophorèse apporté des amélioration dans les maux de dos pour les étudiantes.

Mots clés: Diadynamique actuelle, ionophorèse, lumbago.

ANÁLISIS Y COMPARACIÓN DE LAS CORRIENTES DIADINÁMICAS AISLADA Y ASOCIADA A LA IONTOFORESIS, APLICADAS EN LA LUMBALGIA DE ESTUDIANTES DEL SEXO FEMENINO

RESUMEN

La iontoforesis es una técnica no invasora de administración de drogas en la forma iónica para el organismo, que utiliza corriente eléctrica, con mayores satisfacciones cuando es comparada con la absorción percutánea pasiva. Las Corrientes Diadinámicas poseen efectos analgésicos y componentes galvánicos esenciales para el uso de la iontoforesis. A lumbalgia, cada vez más presente en la población mundial trae asociaciones de procesos inflamatorios y cuadro de dolor debido a diversas causas. La investigación tuvo como objetivo analizar y comparar los efectos de las Corrientes Diadinámicas aislada y asociada a la iontoforesis en la lumbalgia de estudiantes del sexo femenino. Participaron de la investigación 12 estudiantes del sexo femenino con edad entre 18 y 26 años con quejas de dolor lumbar desde hace más de un año. Las participantes fueron evaluados inicialmente de varios criterios, junto a los cuales fue aplicada una escala de intensidad de la dolor y después reaplicada y comparada con los resultados iniciales. La muestra fue dividida en dos grupos al azar, el GRUPO 1 recibió el protocolo de Corrientes Diadinámicas aislada y el GRUPO 2 Corrientes Diadinámicas asociada a iontoforesis con dexametasona 0,1%, siendo realizadas siete sesiones. El aparato utilizado para aplicación de las corrientes fue el ENDOFHASYS EUS-0503, marca KLD Biosistemas. La intensidad de la corriente fue de acuerdo con la sensación subjetiva del paciente. Los datos fueron analizados estadísticamente a través del programa Microsoft Excel 2003, y para las variables, testes no-paramétricos de los signos de Wilcoxon y teste U. de Mann Whitney, donde p=0,05 determina significación, del programa SPS for Windows 13.0. Los resultados obtenidos fueron significativos para los dos tratamientos, GRUPO 1 p=0,02 y GRUPO 2 p=0,02, observando una mejora del 21% del tratamiento del GRUPO 2 en relación al GRUPO 1. Se concluye que tanto las Corrientes Diadinámicas aislada, como asociada a la iontoforesis trajeron mejora significativa en la lumbalgia de estudiantes del sexo femenino.

Palabras-clave: Corrientes Diadinámicas, Iontoforesis, Lumbalgia.

ANÁLISE E COMPARAÇÃO DAS CORRENTES DIADINÂMICAS ISOLADA E ASSOCIADA À IONTOFORESE, APLICADAS NA LOMBALGIA DE ESTUDANTES DO SEXO FEMININO

RESUMO

A iontoforese é uma técnica não invasiva de administração de drogas na forma iônica para o organismo, que utiliza corrente elétrica, com maiores satisfações quando comparada à absorção percutânea passiva. As Correntes Diadinâmicas possuem efeitos analgésicos e componentes galvânicos essenciais para o uso da iontoforese. A lombalgia, cada vez mais presente na população mundial traz associações de processos inflamatórios e quadro de dor devido diversas causas. A pesquisa teve como objetivo analisar e comparar os efeitos das Correntes Diadinâmicas isolada e associada à iontoforese na lombalgia de estudantes do sexo feminino. Participaram da pesquisa 12 estudantes do sexo feminino com idade entre 18 e 26 anos com queixa de dor lombar há mais de um ano. Os participantes foram avaliados inicialmente a vários critérios, junto aos quais foi aplicada uma escala de intensidade da dor e depois reaplicada e comparada com os resultados iniciais. A amostra foi dividida em dois grupos aleatoriamente, o GRUPO 1 recebeu o protocolo de Correntes Diadinâmicas isolada e o GRUPO 2 Correntes Diadinâmicas associada a iontoforese com dexametasona 0,1%, sendo realizadas sete sessões. O aparelho utilizado para aplicação das correntes foi o ENDOFHASYS EUS-0503, marca KLD Biosistemas. A intensidade da corrente foi de acordo com a sensação subjetiva do paciente. Os dados foram analisados estatisticamente através do programa Microsoft Excel 2003, e para as variáveis, testes não-paramétricos dos sinais de Wilcoxon e teste U. de Mann Whitney, onde p=0,05 determina significância, do programa SPSS for Windows 13.0. Os resultados obtidos foram significativos para os dois tratamentos, GRUPO 1 p=0,02 e GRUPO 2 p=0,02, observando uma melhora de 21% do tratamento do GRUPO 2 em relação ao GRUPO 1. Conclui-se que tanto as Correntes Diadinâmicas isolada, quanto associada à iontoforese trouxeram melhora significativa na lombalgia de estudantes do sexo feminino.

Palavras-chave: Correntes Diadinâmicas, Iontoforese, Lombalgia.