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RESEARCH ARTICLE

EFFECTIVENESS OF THE TREATMENT PROTOCOL IN GONARTHROSIS GRADE II IN FEMALE PATIENT.

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Abstract

The present work focuses on identifying the effectiveness of the protocol of physiotherapeutic treatment in female patients with gonarthrosis grade II, in the Physiotherapy clinic of the Autonomous University of Campeche, keeping a weekly record within two months of the progress of signs and symptoms present in the condition.

Objective: To demonstrate the benefit of pain relief through the application of the protocol established with the Trabert current.

Material and methods: This research is based on a case study with a quantitative, descriptive, quasi-experimental approach.

Instrument: Numerical scale of VAS applied to a 75-year-old female patient with grade II gonarthrosis.

Results: In the tenth session, the patient determined that there was no pain according to the VAS scale dated February 26, 2019, in addition Table 2 shows records with the results taken once a week.

Conclusions: Fortunately, the technological advances of physiotherapy have led to the implementation of methods that together help to plan treatments that improve the recovery of patients with chronic degenerative diseases.

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Introduction:-

Gonarthrosis or also called osteoarthritis (OA) is a very frequent rheumatic disease worldwide that constitutes one of the main causes of joint pain and disability in the adult population. It mainly affects women and its frequency increases with age. It is estimated that more than 80% of people over 60 years of age present in at least one joint, this thanks to the radiological evidence presented by patients as a result of osteoarthritis (Kellgren JH, 1957).

The factors that are associated with the development of the disease in addition to age and sex are obesity, trauma, genetic factors and mechanisms related to the occupation, as well as previous surgeries.

Degenerative lesions not only affect articular cartilage, they also include ligaments, menisci and particular muscles (Image 1 and 2). Another factor is the pathological changes that are observed mainly at the level of the articular cartilage, in addition to the areas of greater articular weight load which is a determining factor. Likewise, there may be inflammation of the synovial membrane with effusion and coincide with this condition. Obesity is a risk factor for Osteoarthritis, as are jobs that require squatting for a long time and activities that require heavy lifting.

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The etiology of gonarthrosis is divided into two main causes: primary and secondary, in the primary cause there is an acceleration of the normal process of cartilage aging, although its origin is unknown, a number of factors involved in the disease development or increase the likelihood of osteoarthritis manifesting. Secondary causes can be divided into: a) Metabolic (diabetes mellitus); b) Septic; c) Traumatic; d) Due to angular deformities or deviations of the axes (presence of genu valgo or genu varo) (Pasos, F, 2008).

Knee gonarthrosis is one of the main causes of musculoskeletal pain and disability worldwide in adult patients (Rheumatology, 2010) is an articular pathology with a prevalence greater than 44.7% (Uthman OA, 2013).

About 85% of the population over 65 years of age presents radiological evidence of Osteoarthritis in more than one joint. 33% of adults over 60 years of age have radiological data of knee osteoarthritis (Bosomworth, 2009).

In Mexico, according to a review of the current literature from various sources nationwide, it shows that gonarthrosis has become a serious public health problem and that based on the increase in the current average life, an increase in the number is expected of subjects who will suffer from gonarthrosis in the coming years. The prevalence of osteoarthritis in the adult population in Mexico is estimated at 10.5% (Espinosa MR, 2013).

Predominating the pathology in the female sex with 11.7% and 8.71% of the male sex with important variations according to the different regions of the country, in a report of a rural population of the southern region of the country a relatively higher prevalence of 5.8 % (95% CI: 4.1 to 7.5) was found, according to the statistical reports of the Mexican Social Security Institute (IMSS). (Álvarez-Nemegyei J, 2005).

In order to have more precise data in the Physiotherapy Clinic of the Autonomous University of Campeche, the number of active patients suffering from Gonarthrosis was counted during the month of January and February of 2019, being the alarming figures since the sum of the evening and morning shift, a total of 136 patients show up, with 16 patients presenting a diagnosis of gonarthrosis grade II and grade III, ranging in ages from 60 and 75, standing out of the 16 patients, thirteen are women and three men. (Graph 1 and 2). Checking by the data provided that the gonarthrosis disease is one of the pathologies that has alarming figures in the Campeche community.

Thanks to scientific and technological advances focused on areas of medicine and physiotherapy, it has been found that the use of agents such as electrotherapy, which generate significant advances in patients with chronic degenerative conditions. The Trabert current is a powerful tool for some inflammatory and degenerative pathological processes and pains. The possibility of using this current for the segmental therapy of hyperalgesic areas has been pointed out. This current is monophasic and rectangular impulses, has a pulse duration of 2 ms and an interval between the pulses of 5 ms, producing a frequency of (+ -) 143 Hz (Figure 1) (HP, 1986).

Among the many possibilities that this offer is the treatment of patients with bone conditions. So, the application of the Trabert current in the knee joint for a grade II gonarthrosis process produces an analgesic effect. The analgesic effect is achieved by the selective stimulation of thick nerve fibers, fast conduction that is proprioceptive fibers, through the theory of pain, as well as for the stimulation of substances such as serotonin being used mainly in painful pathologies with chronic phase (Plaja, 1998).

Some of the effects produced by the Trabert current are fleeting muscular contractions, which is why they are also called dynamic or ultra-exciting, in this sense it must be remembered that the stimulus to become conscious before reaching the cortex must reach the basal nuclei. When the intensity of this type of stimulus is significant at the level of the nuclei of the thalamus, direct connections with the hypothalamic area will occur and through this pathway the release of endogenous opioids such as endorphins is stimulated. The latter have a great analgesic benefit for the patient (Martín, 2018).

Material and method: -

This research is based on a case study with a quantitative, descriptive, quasi-experimental approach. When selecting the pain scale that I use as a tool to assess the degree of pain as a reference, a 2017 ISSSTE database was taken.

The study was carried out on a 75-year-old female patient with right unilateral grade II gonarthrosis, who entered on January 22, 2019 at the Physiotherapy Clinic of the Autonomous University of Campeche, this patient mentions that in December 2018 she suffered a fall mechanism, causing a hyperextension of the right leg generating a pain in the anterior face of this joint in a degree 7 according to the VAS scale, however the patient reports that previous months already suffered from pain and crepitations in the knee by what after the injury goes to your doctor, who suggests

taking x-rays which confirm the diagnosis of gonarthrosis in the medial and femoropatellar compartment, in addition to a joint narrowing between the internal condyle and the tibial plateau this due to joint wear, in addition of multiple osteophytes at the base of the kneecap and the presence of suprapatellar bursitis is very common due to the mechanism of injury.

At the evaluation carried out on January 22, 2019, the vital signs of the endomorphic biotype patient are stable, an affected gait is observed as it enters the physical therapy area with monopodal orthotic support (walking stick), using the left leg as support for the oscillation movement, the cane supports it with the upper right limb with an elbow flexion when supporting the affected limb, there is no presence of arm stroke in the upper right limb, the right shoulder is elevated due to the support of the cane, presence of bilateral inversion of the ankles, evidence of genuine valgus with 20 ° deviation, taking as reference the angle the patient presents a flexor trunk pattern during walking, and refers limitation to perform their domestic activities as well as pain when walking long distances and climbing stairs.

The right knee area with inflammation with Godet sign in grade 1 is palpated with 3 seconds fade time at the lateral condyle level (Image 3), with a circumference of the right knee of 43 cm, passive and active movement crepitation during flexoextension of the knee and the mobilization of the label in different axes, in a bipedal position the label is palpated with ascent and deviation towards the lateral condyle, the sensitivity is normostable and the quadriceps muscle tone is hypotonic.

Goniometry measurements were performed which threw smaller arcs of movement in the right limb, compared to the left knee (Table 1). Once the physiotherapeutic examination has been carried out, it is decided to apply the Trabert current as the central point of the treatment protocol in the patient of gonarthrosis grade II, the method to use the Trabert current is by means of the bipolar technique, with large electrodes, however the process of accommodation of this current arises within a few minutes of starting the application so it is common to increase the intensity three to four times during the session, causing the patient's pain threshold to also increase progressively with the passage of therapeutic sessions (Danz, 1980).

The Trabert current consists of the following parameters applied to the patient:

Frequency: 143 Hz; amplitude: 60-80 mA, phase duration: 2 ms; pause duration: 5 ms; rubber electrode 10 cm long by 7 cm wide; moistened sponges; Velcro band to hold; the negative electrode (black) was placed on the inner edge of the knee and the positive electrode (red) on the outer edge of the knee; - Treatment time: 15 minutes; treatment sessions: 14; Frequency: twice a week.

In addition, during the first 4 sessions, cryomassage was applied for 5 minutes to reduce inflammation in the suprapatellar bursa and the analgesic laser on a painful point with the following parameters: 250 Hz frequency; intensity of 8 J / cm²; power of 200 pps. The laser is a powerful tool that stimulates mast cell degranulation and triggers the release of mediators of the inflammatory response, which generates pain relief, as well as decreasing the high effect of bradykinins, lowering the painful threshold of neurons and reducing release of substance "P" in the medulla and achieve the release of pain-mediating endorphins.

When using the intensity of the high current during the sessions it causes muscular contractions and the increase of the blood flow in the zone of placement of the electrodes, consequently the effect of the law of Joule takes place increasing the circulation directly proportional to the time of application and the intensity of the current squared (Toro, 2019).

Obtaining as a consequence that during the course of the sessions the intensity of the current was gradually increasing due to the fact that it causes an accommodation process after each application and the placement of the poles was taken strategically since the negative pole favors the trophism and alkalizes the medium, so it is suitable for processes with low inflammatory level and cluster of catabolites, the positive pole instead reduces the metabolic activity, coagulates and reduces the hyperexcitability of nerve endings that generate pain. (Albornos Cabello, Maya Martin, & Toledo Marhuenda, 2016). In addition, the negative pole produces a stimulation of blood circulation through the Joule effect on the skin, improving circulation as a result of muscle relaxation and finally at the segmental level an orthosympathetic influence occurs (Figure 2).

The evaluation instrument focused on identifying pain relief by applying the numerical scale of VAS pain, goniometry, Godet sign and measurement of knee joint circumference, keeping a record in the Physiotherapy Clinic of the Autonomous University of Campeche, for a period of two months.

The VAS scale uses a graduated line in centimeters from 0 to 10, where point 0 means the absence of pain and 10, the maximum pain (Image 6), the patient is asked to point with a circle inside the scale the score and the interpretation is performed to determine the intensity of their pain according to the following aspects: 1) mild pain, if the patient refers to the pain as less than 3; 2) moderate pain, if the assessment is between 4 and 7; 3) severe pain, if the assessment is equal to or greater than 8.

The application of the scale and quantitative data were made at the beginning of the treatment, after which a weekly record of the patient's progress was made, for which a data collection table was prepared where the results were expressed. Taking the pain assessment as a VAS scale was applied during the first session and again assessed in the tenth treatment session.

Results: -

In the following tables 1 and 2, the comparison of the results regarding the measures of arc of movement is given, as well as the Godet sign using the time as an indicator and the circumference of the knee to determine the inflammation, these shots are applied during the treatment weeks once a week, data collection began from the third treatment session.

From the second week of treatment according to the records of (Table 2), where it can be noted that the arcs of movement increased, the Godet sign and the circumference of the affected knee evidently decreased in terms of the inflammatory process, as they were Advancing the sessions, the favorable results continued to be evident, giving how the eradication of pain perception was achieved after the tenth treatment session and the arcs of movement recorded similar degrees to the opposite limb, the pain when walking long distances or climbing stairs had decreased during the sixth session where only Trabert currents were worked, which leads us to visualize favorable physiological effects for the speedy recovery of the patient with this condition, in addition that the patient commented that she already carried out her daily life activities without difficulties, since she is a very active woman in maintenance of home.

DATE	HIP GONIOMETRY				KNEE GONIOMETRY		SIGN OF GODET	KNEE CIRCUMFERENCE	
	Hip extension		Hip flexion		Knee flexion			Right knee	Left knee
Movement							3 sec.		
31-01-19	Right 20°	Left 25°	Right 50°	Left 65°	Right 72°	Left 110°		43 cm	39 cm
07-02-19	26°	26°	72°	75°	100°	120°	2 sec.	41 cm	39 cm
14-02-19	26°	26°	75°	75°	110°	110°	1 sec.	40 cm	39 cm
21-02-19	27°	27°	110°	110°	111°	111°	0 sec.	40 cm	39 cm
28-02-19	28°	28°	115°	115°	113°	113°	0 sec.	40 cm	39 cm
19-03-19	28°	28°	117°	119°	114°	115°	0 sec.	39 cm	39 cm

Table 2: -Registration with results taken once a week in the patient with grade II.

Regarding the pain scale, two records were taken to determine the progress of its relief. During the application of the VAS scale in the first session it was maintained in a grade 7, it was registered with the date January 24, 2019, that is to say a moderate pain, in the tenth session the patient determined that there was no pain according to the same scale dated February 26th of the same year.

Conclusion: -

Fortunately, with the use of physical agents as a tool for the treatment of chronic degenerative pathologies, as well as the use of technological advances and innovations in medicine, which together with physiotherapy have contributed to diseases such as gonarthrosis have relief of pain, a speedy recovery and also favoring the process of disinflammation and stimulation of substances such as serotonin through the pain gate process to relieve it, this

thanks to the application of the protocol with the Trabert current, this current for years it had been forgotten but the benefits it generates make it a very valuable tool in the field of applied physiotherapy. Considering that the efficacy of the treatment, applied in the patient with gonarthrosis grade II, showed favorable evidence in the reduction of the signs and symptoms from the first sessions. No comparisons were made with other treatments, so no other research was found that will address the application of said protocol in the pathology of gonarthrosis grade II, obtaining an established effective physiotherapeutic plan.

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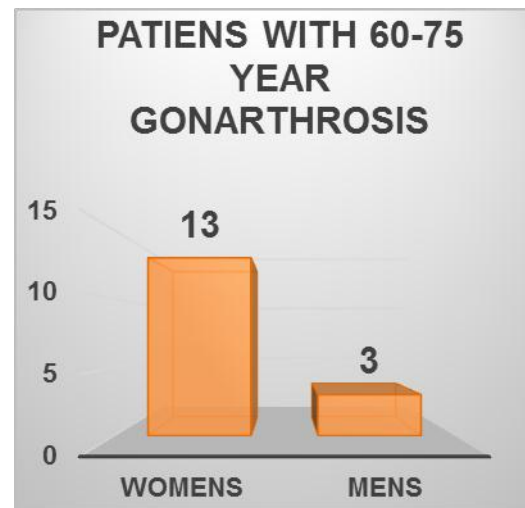
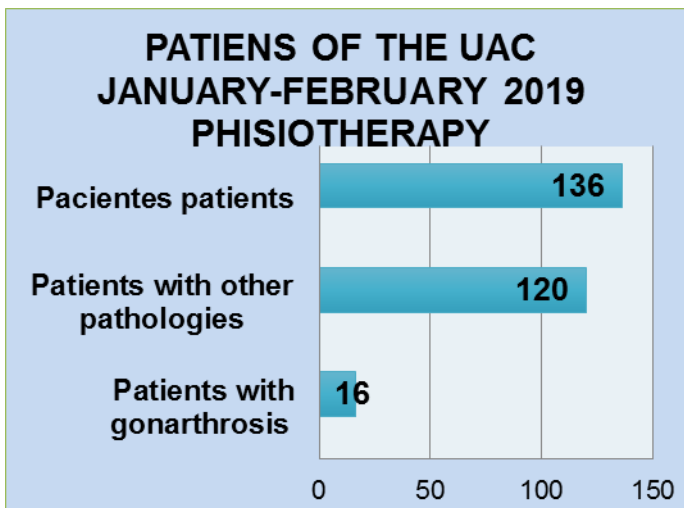
Annexes



Image 1: - Radiological evidence dated December 14, 2018 with evidence of bone wear and joint deformation.



Image 2: -Radiological evidence with anteroposterior view showing multiple osteocysts in the ventral aspect of the patella.



Graph 1 y 2: -Statistical data collected from the database of the Physiotherapy Clinic of the Autonomous University of Campeche.

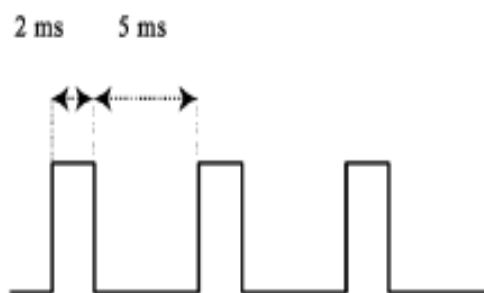


Figure 1: -Scheme of the Trabert current, type of single-phase current with quadrangular pulses

(Albornos Cabello, Maya Martin, & Toledo Marhuenda, 2016)



Image 3: -Maneuver of the Godet sing, which determines grade 1 in edema



Image 4: -Placement of cathode and anode.

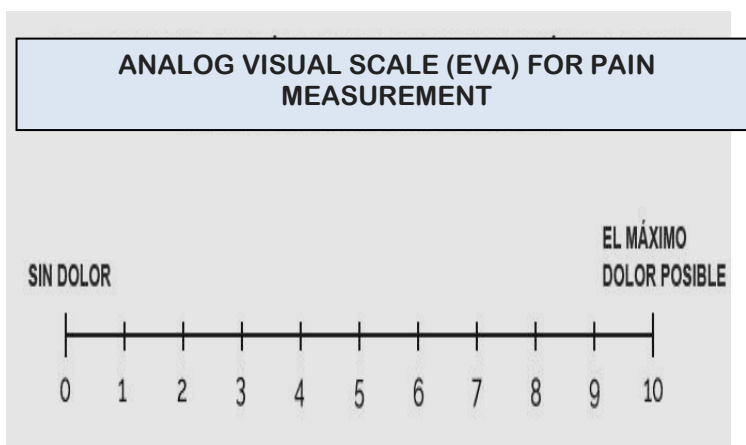


Figure 2: -Scale used in the patient to determine the degree of pain. (State, 2019)

Movement	Right limb	Left limb
Knee flexion	55 degrees	110 degrees
Hip flexion	60 degrees	75 degrees
Hip extension	15 degrees	22 degrees

Table 1: -Bilateral knee joint mobility arch dated january 22, 2019. (Hislop & Motgomery).