ABSTRACT

BACKGROUND AND OBJECTIVES: Chikungunya fever is caused by the chikungunya virus, but with characteristics similar to the dengue fever. The main clinical manifestation that differs from dengue is the strong joint pains, which can remain for long periods, and that is found at lower intensity and duration with dengue. The objective of this study was to contribute to the physical therapy in patients with persistent polyarthritis after chikungunya fever.

CASE REPORT: Female patient, 35 years old, diagnosed with persistent polyarthritis after chikungunya fever. When admitted to the physiotherapy service, she complained of severe pain in the knee, wrist and right ankle, mainly in the morning. For the physiotherapeutic evaluation, the following parameters were used: visual analog scale, use of painkillers, goniometry, modified sphygmomanometer test, and perimetry. The functional assessment was done through a 10m walking test, Quick Dash and Lequesne scales, Portuguese version, for the upper and lower limbs, respectively. The proposed physiotherapeutic program was based on therapeutic exercises and manual therapy for 4 weeks. The results showed that the proposed physical therapy was effective in decreasing the pain, increasing muscle strength, the range of motion, decreasing edema and improving functional capacity.

CONCLUSION: The physiotherapeutic treatment proved to be effective in treating a patient with persistent polyarthritis after chikungunya fever, improving the subjective pain and functional capacity.

Keywords: Arthralgia, Chikungunya fever, Physical therapy.

INTRODUCTION

The chikungunya fever (CF) is an arbovirusosis caused by the chikungunya virus (CHIKV), transmitted through the bite of the *Aedes aegypti* female mosquitoes infected by *Aedes albopictus*. The viremia can persist for up to 10 days, after the onset of the clinical manifestations that are similar to dengue, namely: acute fever, joint and muscle pain, headache, nausea, fatigue, and rash. The CF has two phases: acute and chronic. At first, patients usually have a high fever, chills, headache, nausea, vomiting, fatigue, back pain, myalgia, and polyarthralgia. This last one can be intense and disabling, mainly affecting the ankles, fists, and hands.
Concerning the characteristics of arthralgia, it does not have a pattern, although it tends to be more intense in the morning. The duration of arthralgia is still uncertain, lasting for months and years. The chronic symptoms may decrease with time, after an initial infection, being of 88 to 100% during first the six weeks. The full recovery time is still uncertain, and some infected patients can still remain symptomatic six to eight years after the initial infection, in which the polyarthritis considerably compromises the quality of life and functional capacity of the individual.

Given to the similarity of the clinical signs between dengue and CF, it is important that healthcare professionals are attentive to the differential diagnosis. The main clinical manifestation that distinguishes the infection by CHIKV from dengue is the strong joint pain, usually present in lower intensity in dengue with a faster resolution.

The epidemiological aspects point to an increasing number of people affected with the CF in last the 10 year. Of these, it is estimated that the cumulative number of infected individuals suffering from disabling and long-lasting pain is of approximately 1 per 2 million, generating high costs to the health systems.

Different predictor factors have been involved in the development of this more delayed picture of the CF, mainly characterized by the presence of persistent musculoskeletal pain. Among them are age above 45 years, high-intensity initial pain, previous osteoarthritis and strong IgG-specific response to the CHIKV in the recovery period and in the chronic phase.

The pathophysiological mechanisms of musculoskeletal pain and arthritis, after the infection by the CHIKV, are not very are well defined yet. It is believed that these symptoms are caused by the virus early escape located inside the monocytes, with a consequent replacement within the synovial macrophages. This fact is reinforced by the observation of the persistence of the virus in muscle, joints, hepatic and lymphoid tissues.

It is worth mentioning that in spite of the increasing number of people diagnosed with CF, so far there is no kind of recommendation based on guidelines for its treatment. In general, the treatment is with drugs (antipyretics and analgesics), in order to control the fever, reduce the impact of the immune process, decrease pain and prevent the development of chronic joint lesions.

When the pharmacological treatment of the CF does not present a satisfactory result, mainly in relation to the persistent arthralgia (chronic), many individuals end up needing a physiotherapeutic treatment. The focus of the physiotherapeutic intervention is to decrease pain, regain functional capacity and, consequently, improve the quality of life. However, no study was not found in the literature addressing the physiotherapeutic intervention in individuals with persistent polyarthritis after the infection by the CHIKV. This fact led to the elaboration and presentation of the present report.

**CASE REPORT**

Female patient, 35 years, 1,68m tall, 86kg, brown, administrative assistant, native from Rio de Janeiro. Admitted to the physiotherapy service in August 2016, reporting as main complaint “a lot of pain in the wrists and knees, especially when waking up.” The patient reported that on December 6, 2015, she had a sudden onset of high fever (40°), edema on the distal joints (feet and hands) and disabling polyarthritis with symmetric characteristics, with more intense pain in ankle and wrist bilaterally. She immediately sought medical care at the public health network. She underwent laboratory tests, being medicated with painkillers (dipyrrone) and anti-inflammatory drugs (paracetamol). About three days later, she was clinically diagnosed with CF, confirmed by positive serology. She was oriented to keep on taking dipyrrone and paracetamol, to remain at rest with no labor activity and to ingest liquids to improve her clinical picture. The patient followed the instructions for six months. However, the polyarthralgia remained. Due to the difficulty to schedule a new medical appointment on the public health network, she only managed to return to the doctor after seven months of the onset of the symptoms, in July of 2016. She was told to stay with the drugs and to look for physiotherapeutic care to reduce her pain. She had a previous pathological history of systemic arterial hypertension (SAH) and a non-diagnosed gonalgia in the right lower limb. Regarding the social history, she reported not being alcoholic or smoker, living in an easily accessible place, as well as holding back her social, labor and physical activities due to the intense pain, being quite dissatisfied with this situation. At the time of the assessment, she was making continued use of painkillers and anti-inflammatory drugs (paracetamol and dipyrrone), reporting constant abdominal pain, associating the pain to the continuous use of drugs.

When admitted to the physiotherapy service, the patient complained of severe pain in knee, wrist and right ankle, mainly in the morning. During the examination, it was noticed limping gait - with no auxiliary gait device - antalgic posture when sitting, painful facial expression at rest, edema in the wrist (++/+4+), knee (++/+4+) and ankle (+/4+). All the previously mentioned joints - knee, ankle, and wrist - presented pain on palpation, with greater intensity in the right wrist. The sensitivity was perfect in all body segments, with discreet hyperesthesia in the wrist and right knee. As evaluation parameters to identify the pre-and post-intervention effects the following instruments were used: the visual analog scale (VAS) and the intake of analgesics reported by the patient to measure the subjective pain, goniometry to quantify the range of motion (ROM), the modified sphygmomanometer test (MST) to evaluate muscle strength and perimetry for edema volume. The functional assessment was done through the 10m walking test, (TC10), Quick Dash and Lequesne scales, Portuguese version, for the upper and lower limbs, respectively. Previously to the first intervention protocol, it was briefly explained to the patient the harmful effects to the body from the prolonged use of analgesic and anti-inflammatory drugs, and she was advised to try to gradually reduce the use, daily writing down the amount of ingested drugs. No specific explanation was provided on the neurophysiological mechanisms of the pain. However, it was explained that the exercises should be done even when in pain, provided it was tolerable. The proposed physiotherapeutic program was based on the kine-
Physiotherapy approach and manual therapy for 4 weeks. Table 1 shows the description of the approach.

The comparison of the variables values before and after the treatment protocol, allowed to confirm the presence of considerable alterations with the applied intervention. To follow-up the results after the treatment period, the patient was reevaluated one month after concluding the protocol. The values of each variable are shown table 2.

**Table 1. Description of physiotherapeutic approach adopted during 4 weeks of intervention**

| Week of treatment | Intervention                                                                 |
|-------------------|-----------------------------------------------------------------------------|
| Weeks 1-2*        | UL: 1 - Radio-carpica articular decoaptation/traction (40-60 repetitions/minute); 2- Myofascial release of the wrist extensors/flexors retinaculum (3 minutes each region); 3- Grade I-II articular mobilization for wrist flexion/extension (40-60 oscillations/minute); 4- Stretching technique for wrist extension/flexion + passive stretching of wrist extensors/flexors (60 oscillations/minute + 1 minute of stretching); 5- Passive mobilization for wrist flexion/extension (12 repetitions for each movement); Home Cryotherapy in the painful areas (20 min 3x/day). Patient’s positioning: 1, 2 and 3-supine position (SP) with UL along the body; 4 and 5-SP with 90° elbow flexion. LL: 1-Decoaptation/femorotibial articular traction (60 repetitions per minute); 2- Grade I-II articular mobilization for knee flexion (40-60 oscillations/minute); 3- Ankle pump associated to draining position; 4- Passive stretching of the triceps sural muscle (1 minute); Patient’s position: 1-Sitting on the stretcher; 2-SP with the lower limbs with the maximum range of motion of knee flexion; 3-SP with the lower limbs in elevation on the triangle; 4-SP. |
|                   | * = at the beginning of the treatment the patient was instructed to remain physically active and to perform active movements for knee, ankle, and wrist in the morning, when waking up. ** = after week 4, the patient was instructed to gradually start physical activity (walking), in accordance with the pain tolerance) until reaching the goal of 150 minutes/week; UL = upper limbs; LL = lower limbs; SLR = straight-leg raising; SP = supine position. |
| Week 3-4 **       | UL: 1-Active exercise with a stick for bilateral flexion/extension movements of the wrist (2 x/12 repeats); 2-Strengthening with 1kg halter for wrist extensors/flexors (2 x/12 repeats); 3-Palmar prehension isometric exercise with visual feedback from the sphygmomanometer with 70% of maximum voluntary isometric contractions (2x/10 repetitions with 3-5 seconds); Patient’s position: 1- SP with 90° of UL flexion; 2- Sit on the stretcher with 90° flexion of elbow and forearm prone/supine; LL: 1-Active movement of triple flexion of LL with the aid of the Swiss ball; 2- Strengthening of the quadriceps with 1kg shin pads (2x/12 repetitions) + evolution to strengthening of the quadriceps sitting on the stretcher (2x/12 repetitions); 3- SLR with no additional weight + evolution with 1kg shin pad; Patient’s position: 1-SP with a 35cm Swiss ball under the distal extremities of the LL; 2- SP with a triangle under the knee; 3- SP. |

**Table 2. Results of the variables before and after 4 weeks of the physiotherapy protocol and one-month follow-up**

| Variables                   | Pre-treatment | Post-treatment | Follow-up (1 month) | Difference pre/post treatment |
|-----------------------------|---------------|----------------|---------------------|-------------------------------|
| Visual analog scale         |               |                |                     |                               |
| Wrist                       | 8             | 7              | 3                   | -5                            |
| Knee                        | 8             | 5              | 3                   | -5                            |
| Ankle                       | 6             | 3              | 1                   | -5                            |
| Range of motion (degrees)   |               |                |                     |                               |
| Knee flexion                | 64            | 102            | 120                 | +56                           |
| Wrist extension             | 40            | 62             | 74                  | +34                           |
| Wrist flexion               | 26            | 54             | 74                  | +48                           |
| Dorsiflexion                | 6             | 10             | 16                  | +10                           |
| Plantarflexion              | 26            | 38             | 38                  | +12                           |
| FM-TEM (mmHg)               |               |                |                     |                               |
| Palmar prehension           | 19,3          | 40,6           | 79,3                | +60                           |
| Knee extension              | 100           | 168            | 186,6               | +86,6                         |
| Perimetry (cm)              |               |                |                     |                               |
| Wrist                       | 19            | 17             | 17                  | -2                            |
| Knee                        | 46            | 45             | 45                  | -1                            |
| Ankle                       | 52,5          | 52             | 52                  | -0,5                          |
| Functional scales           |               |                |                     |                               |
| Quick Dash                  | 73            | 34             | 7                   | -39                           |
| Lequesne                    | 13            | 7              | 1,5                 | -11,5                         |
| Drugs                       |               |                |                     |                               |
| Dipyrone                    | Continuous use| Continuous use | 1/day               | Not using                     |
| Paracetamol                 | Continuous use| Not using      | Not using           | Not using                     |
| TC10M (seconds)             | 15,4          | 12             | 7,1                 | -8,3                          |

MS = muscle strength; MST = modified sphygmomanometer test; TC10m = 10m walking test.
**DISCUSSION**

The persistent polyarthralgia associated to the functional limitation is often considered one of the main complications of the CF. Due to this, many patients end up needing physiotherapy follow-up to improve the algesic picture and the quality of life. The results of the present study show that the proposal of a physiotherapy treatment with kinesiotherapy and manual therapy had a positive influence on several aspects for a patient with persistent polyarthralgia (Table 1), namely the reduction of the algesic picture; increase in muscle strength; increase the range of motion; reduction of edema and improvement of the functional capacity.

The physiotherapy approach, by means of a well-structured treatment program, is widely indicated for patients with chronic-degenerative joint diseases. There are strong evidences that a rehab program based on motivation and orientation to self-care, muscle strengthening, low-impact aerobic exercises and neuromuscular education help to decrease the symptoms of patients with osteoarthritis.

In this context, the present results corroborate the literature since with a treatment program with these characteristics, mainly based on kinesiotherapy together with manual techniques and orientation about self-care, it was possible to decrease the algesic picture considerably and to improve the functional capacity of a patient with persistent polyarthralgia after CF.

It is believed that such effects may be related to the hypoalgesia induced by comprehensive therapeutic exercises and by the activation of the endogenous pain descending inhibitory pathways activated by the manual therapy techniques, as already observed in other studies. In the present study, the reduction in pain was noticeable, especially on the VAS pre-and post-intervention, as well as by the decreased intake of analgesics (Table 2).

In this context, having the pain variable as predominant, it is possible that the secondary outcomes such as ROM, muscle strength and functional capacity have been positively influenced due to the reduction of the algesic picture (Table 2). It is worth mentioning that all exercises were performed gradually, taking into consideration the patient’s tolerance to pain during its performance.

It is also important to highlight the recommendation to the patient to do a regular physical activity (walking) after the outpatient follow-up period to maintain the obtained results and the encouragement to self-care. The regular physical activity has been considered an excellent treatment option for some types of chronic pain, as the fibromyalgia, non-specific chronic back pain, osteoarthritis and rheumatoid arthritis, in addition to strongly contribute to the general health. In the present study, the patient was very engaged and motivated during all the rehab process, and she was the one who chose walking as the preferred exercise. Recent studies have demonstrated that when encouraging the practice of physical exercises to patients with chronic pain, it is of crucial importance to take into consideration the preferences of the patient. This makes it easier to have the patient’s compliance and the continuity of the exercise program with short, medium and long-term results, and also to strengthen the therapeutic alliance.

**CONCLUSION**

The treatment program proposed in the present study can benefit patients with persistent polyarthralgia after the chikungunya fever, decreasing the pain perception and improving the functional capacity.

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