

# Effect of a physiotherapy program in patient with persistent polyarthralgia after chikungunya fever. Case report

*Efeito de um programa de tratamento fisioterapêutico em paciente com poliartralgia persistente pós-febre de chikungunya. Relato de caso*

Alexsandro da Silva Oliveira<sup>1</sup>, Júlio Guilherme Silva<sup>1</sup>

DOI 10.5935/1806-0013.20170132

## 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 polyarthralgia after chikungunya fever.

**CASE REPORT:** Female patient, 35 years old, diagnosed with persistent polyarthralgia 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 polyarthralgia after chikungunya fever, improving the subjective pain and functional capacity.

**Keywords:** Arthralgia, Chikungunya fever, Physical therapy.

## RESUMO

**JUSTIFICATIVA E OBJETIVOS:** A febre de chikungunya é causada pelo vírus chikungunya, porém apresenta características parecidas com a dengue. A principal manifestação clínica que a difere da dengue são as fortes dores articulares, que podem permanecer por longos períodos, e que são encontradas em menor intensidade e tempo de duração na dengue. O objetivo deste estudo foi contribuir para o tratamento fisioterapêutico em pacientes com poliartralgia persistente pós-febre de chikungunya.

**RELATO DO CASO:** Paciente do sexo feminino, 35 anos de idade, diagnosticada com poliartralgia persistente pós-febre de chikungunya. Ao ser admitida no serviço de fisioterapia, queixava-se de dor intensa no joelho, punho e tornozelo direito, principalmente pela manhã. Para avaliação fisioterapêutica foram usados os seguintes parâmetros: escala analógica visual, ingestão de analgésicos, goniometria, teste do esfigmomanômetro modificado e perimetria. A avaliação funcional foi feita por meio do teste de caminhada de 10m, escalas *Quick Dash* e Lequesne versão em português, para o membro superior e inferior, respectivamente. O programa de tratamento fisioterapêutico proposto foi baseado em condutas de exercícios terapêuticos e de terapia manual durante 4 semanas. Os resultados apontaram que a proposta de tratamento fisioterapêutico foi eficaz na diminuição do quadro algico, aumento da força muscular, aumento da amplitude de movimento, diminuição do edema e melhora da capacidade funcional.

**CONCLUSÃO:** O tratamento fisioterapêutico mostrou-se efetivo no tratamento de uma paciente com poliartralgia persistente pós-febre de chikungunya melhorando a dor subjetiva e a capacidade funcional.

**Descritores:** Artralgia, Febre chikungunya, Fisioterapia.

## INTRODUCTION

The chikungunya fever (CF) is an arbovirolosis caused by the chikungunya virus (CHIKV), transmitted through the bite of the *Aedes aegypti* female mosquitos 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<sup>1,2</sup>.

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.

1. Centro Universitário Augusto Motta, Rio de Janeiro, RJ, Brasil.

Submitted in July 19, 2017.

Accepted for publication in October 25, 2017.

Conflict of interests: none – Sponsoring sources: none.

**Correspondence to:**

Avenida Paris, 84 - Bonsucesso  
21041-020 Rio de Janeiro, RJ, Brasil.  
E-mail: alexoliveira06@hotmail.com

Concerning the characteristics of arthralgia, it does not have a pattern, although it tends to be more intense in the morning<sup>3</sup>. 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<sup>1</sup>. 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 polyarthralgia considerably compromises the quality of life and functional capacity of the individual<sup>4</sup>.

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<sup>4</sup>.

The epidemiological aspects point to an increasing number of people affected with the CF in last the 10 year<sup>2</sup>. Of these, it is estimated that the cumulative number of infected individuals suffering from disabling and long-lasting pain is of approximately 1 to 2 million, generating high costs to the health systems<sup>4,5</sup>.

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<sup>3</sup>.

The pathophysiological mechanisms of musculoskeletal pain and arthritis, after the infection by the CHIKV, are not very 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<sup>3</sup>.

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<sup>2,4,6</sup>.

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<sup>2</sup>. The focus of the physiotherapeutic intervention is to decrease pain, regain functional capacity and, consequently, improve the quality of life<sup>1,2,4,6</sup>. However, no study was not found in the literature addressing the physiotherapeutic intervention in individuals with persistent polyarthralgia 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 phys-

iotherapy 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 polyarthralgia 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 (dipyrone) 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 dipyrone 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 dipyrone), 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)<sup>7</sup> and the intake of analgesics reported by the patient to measure the subjective pain, goniometry to quantify the range of motion (ROM)<sup>8</sup>, the modified sphygmomanometer test (MST) to evaluate muscle strength<sup>9</sup> and perimetry for edema volume<sup>10</sup>. The functional assessment was done through the 10m walking test, (TC10)<sup>11</sup>, Quick Dash<sup>12</sup> and Lequesne<sup>13</sup> 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<sup>14</sup>. The proposed physiotherapeutic program was based on the kine-

siotherapy 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 consid-

erable 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*	<p>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).</p> <p>Patient's positioning: 1, 2 and 3-supine position (SP) with UL along the body; 4 and 5-SP with 90° elbow flexion.</p> <p>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);</p> <p>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.</p>
Week 3-4 **	<p>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);</p> <p>Patient's position: 1- SP with 90° of UL flexion; 2- Sit on the stretcher with 90° flexion of elbow and forearm prone/supine;</p> <p>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;</p> <p>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.</p>

\* = 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.

**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				
Dipyrrone	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<sup>1,2,4,6</sup>. Due to this, many patients end up needing physiotherapy follow-up to improve the algesic picture and the quality of life<sup>2,4</sup>. 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<sup>15</sup>.

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<sup>16-18</sup>. 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 such as the fibromyalgia, non-specific chronic back pain, osteoarthritis and rheumatoid arthritis<sup>16</sup>, in addition to strongly contribute to the general health<sup>16,19</sup>. 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<sup>16</sup>. 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 therapeutical alliance<sup>19</sup>.

## 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.

## REFERENCES

1. Javelle E, Ribera A, Degasne I, Gaüzère BA, Marimoutou C, Simon F. Specific management of post-chikungunya rheumatic disorders: a retrospective study of 159 cases in Reunion Island from 2006-2012. *PLoS Negl Trop Dis*. 2015;9(3):e0003603.
2. Ministério da Saúde. Febre de Chikungunya: Manejo Clínico; 2014.
3. Castro AP, Lima RA, Nascimento JS. Chikungunya: vision of the pain clinician. *Rev Dor*. 2016;17(4):299-302.
4. Foissac M, Javelle E, Ray S, Guérin B, Simon F. Post-chikungunya rheumatoid arthritis, Saint Martin. *Emerg Infect Dis*. 2015;21(3):530-2.
5. Sepúlveda-Delgado J, Vera-Lastra OL, Trujillo-Murillo K, Canseco-Ávila LM, Sánchez-González RA, Gómez-Cruz O, et al. Inflammatory biomarkers, disease activity index, and self-reported disability may be predictors of chronic arthritis after chikungunya infection: brief report. *Clin. Rheumatol*. 2016;36(3):695-9.
6. Couturier E, Guillemain F, Mura M, Léon L, Virion JM, Letort MJ, et al. Impaired quality of life after chikungunya virus infection: a 2-year follow-up study. *Rheumatology*. 2012;51(7):1315-22.
7. Boonstra AM, Schiphorst Preuper HR, Reneman MF, Posthumus JB, Stewart RE. Reliability and validity of the visual analogue scale for disability in patients with chronic musculoskeletal pain. *Int J Rehabil Res*. 2008;31(2):165-9.
8. Carvalho RM, Mazzer N, Barbieri CH. Análise da confiabilidade e reprodutibilidade da goniometria em relação à fotogrametria na mão. *Acta Ortop Bras*. 2012;20(3):139-49.
9. Souza LA, Martins JC, Moura JB, Teixeira-Salmela LF, De Paula FV, Faria CD. Assessment of muscular strength with the modified sphygmomanometer test: what is the best method and source of outcome values? *Braz J Phys Ther*. 2014;18(2):191-200. English, Portuguese.
10. Tacani PM, Machado AF, Tacani RE. Abordagem fisioterapêutica do linfedema bilateral de membros inferiores. *Fisioter Mov*. 2012;25(3):561-70.
11. Novaes RD, Miranda AS, Dourado VZ. Usual gait speed assessment in middle-aged and elderly Brazilian subjects. *Rev Bras Fisioter*. 2011;15(2):117-22. English, Portuguese.
12. Orfale AG, Araújo PM, Ferraz MB, Natour J. Translation into Brazilian Portuguese, cultural adaptation and evaluation of the reliability of the Disabilities of the Arm, Shoulder and Hand Questionnaire. *Braz J Med Biol Res*. 2005;38(2):293-302.
13. Marx FC, Oliveira LM, Bellini CG, Ribeiro MC. Tradução e validação cultural do questionário algofuncional de Lequesne para osteoartrite de joelhos e quadris para a língua Portuguesa. *Rev Bras Reumatol*. 2006;46(4):253-60.
14. Louw A, Diener I, Butler DS, Puenteadura EJ. The effect of neuroscience education on pain, disability, anxiety, and stress in chronic musculoskeletal pain. *Arch Phys Med Rehabil*. 2011;92(12):2041-56.
15. AAOS. Treatment of osteoarthritis of the knee evidence-based guideline 2<sup>nd</sup> ed. *Am Acad Orthop Surg Board Dir*. 2013.
16. Nijs J, Lluch Girbés E, Lundberg M, Malfliet A, Sterling M. Exercise therapy for chronic musculoskeletal pain: innovation by altering pain memories. *Man Ther*. 2016;20(1):216-20.
17. Thornton JS, Frémont P, Khan K, Poiries P, Fowles J, Wells GD, et al. Physical activity prescription: a critical opportunity to address a modifiable risk factor for the prevention and management of chronic disease: a position statement by the Canadian Academy of Sport and Exercise Medicine. *Br J Sports Med*. 2016;50(18):1109-14.
18. Louw A, Zimney K, O'Hotto C, Hilton S. The clinical application of teaching people about pain. *Physiother Theory Pract*. 2016;32(5):385-95.
19. O'Keeffe M, Purill H, Kennedy N, O'Sullivan P, Dankaerts W, Tighe A, et al. Individualised cognitive functional therapy compared with a combined exercise and pain education class for patients with non-specific chronic low back pain: study protocol for a multicentre randomised controlled trial. *BMJ Open*. 2015;5(6):e007156.