

# Carpal tunnel syndrome and HIV infection. A case report and literature review

Andrés Reyes-Corcho,<sup>1</sup> Dagnis Barrueta-Reyes,<sup>2</sup> Yadir Bouza-Jiménez,<sup>3</sup> Blas C. Jam-Morales,<sup>4</sup> Yanelka Bouza-Jiménez,<sup>5</sup> Yarima Lopez-Puig<sup>6</sup>

<sup>1</sup>Former Chief of the Department of Infectious Diseases. Gustavo Aldereguía Lima Teaching Hospital, Cienfuegos, Cuba; <sup>2</sup>Neurosurgery Service. Gustavo Aldereguía Lima Teaching Hospital, Cienfuegos, Cuba; <sup>3</sup>Emergency Care Department. Paquito González Cueto Teaching Hospital, Cienfuegos, Cuba; <sup>4</sup>Department of Infectious Diseases. Gustavo Aldereguía Lima Teaching Hospital, Cienfuegos, Cuba; <sup>5</sup>Department of Internal Medicine, Gustavo Aldereguía Lima Teaching Hospital, Cienfuegos, Cuba; <sup>6</sup>Neurosurgery Resident, Neurosurgery Service. Gustavo Aldereguía Lima Teaching Hospital, Cienfuegos, Cuba

## Abstract

The first clinical case of carpal tunnel syndrome (CTS) in Cuban HIV-infected patient was described, and the scientific literature indexed in: PUBMED/MEDLINE, LILACS and BIREME were revised. The case presented was a male with HIV infection without preceding opportunistic illnesses, CD4<sup>+</sup> T cell count over 200 cells/mm<sup>3</sup> and clinical symptoms of pain, tingling and numbness in the right hand and wrist for three months. The electrophysiological study was compatible with CTS. The pharmacological treatment did not modify the symptoms and the patient received specific surgical treatment with absolute resolution of symptoms. CTS is a compressive neuropathy that can occur in HIV-positive individuals with as similar frequency as in the general population. The association between HIV infection and CTS is scarcely described in the medical scientific literature and probably does not represent a different phenomenon from what happens in the HIV-negative population. Nevertheless, its clinical recognition among other neurological and muscle-skeletal manifestations in HIV-infected patients is important.

## Introduction

Carpal tunnel syndrome (CTS) is a compartment compressive neuropathy of the median nerve in the wrist. The disease has a prolonged course of pain, paresthesia and functional limitation of the upper extremities in the median nerve distribution. Although CTS has been described as one of the most common peripheral neuropathy, the prevalence in the general population differs from the published studies.<sup>1</sup> A recent study in Holland reported a crude annual incidence of 1.8 cases per 1000 people.<sup>2</sup> The most extensive research conducted in Switzerland identified a prevalence of 3.8% by clinical diagnosis and 2.7% after considering clinical and electrophysiological findings.<sup>1</sup> Although the syndrome is often an occupational disease predominantly in women,<sup>3</sup> several factors such as obesity, hypothyroidism, and connective tissue diseases have been related in the genesis of this medical condition.<sup>4,5</sup>

Peripheral neuropathic manifestations often occur in HIV-positive individuals. The cytopathic effect of HIV, certain opportunistic infections involving the peripheral nervous system, and in recent years, the neurotoxicity of some antiretroviral drugs, have been raised among the possible etiologies.<sup>5</sup> However, the association between CTS and HIV infection has only been reported anecdotally related with *Mycobacterium avium* complex co-infection.<sup>6</sup> After the advent of highly active antiretroviral therapy (HAART), few case reports have been published and postulated a possible association of the CTS with the prolonged use of viral protease inhibitors (PIs).<sup>5</sup> This communication describes the first case of CTS in a Cuban HIV-infected patient.

## Case Report

The patient was a 35-year-old male with sexual acquired HIV infection since December 2004, so far without suffering from AIDS-related opportunistic diseases or other co-morbidities. He was admitted in the Department of Infectious Diseases at Gustavo Aldereguía Lima Teaching Hospital, concerning pain, numbness and tingling in the right upper limb, primarily in the hand and wrist for three months. Few weeks before the admission symptoms progressively worsened, were more frequent at night, and were not alleviated with analgesics and non-steroidal anti-inflammatory drugs (NSAIDs). The patient had no treatment for HIV infection.

There was no history of trauma, skin lesions suggestive of herpes zoster, fever or headache. There were no clinical stigmata of hypothyroidism or rheumatic disease. The patient had

Correspondence: Yadir Bouza-Jiménez, Lombart St. 9, Cumanayagua, Cienfuegos, Cuba. ZC: 57 600. E-mail: anitasrb2000@yahoo.es

Key words: human immunodeficiency virus (HIV) infection; carpal tunnel syndrome; clinical diagnosis; treatments.

Contribution: AR-C, clinical diagnosis, patients' follow-up, assessment of HIV infection evolution, review of the manuscript; DB-R, surgical treatment, preparation of the manuscript; YB-J, review of the manuscript; BCJ-M, preparation of the manuscript; YB-J, preparation of the manuscript; YL-P, preparation of the manuscript.

Conflict of interest: the authors report no conflicts of interest.

Received for publication: 11 July 2009.

Accepted for publication: 22 September 2009.

This work is licensed under a Creative Commons Attribution 3.0 License (by-nc 3.0).

©Copyright A. Reyes-Corcho et al., 2009  
Infectious Disease Reports 2009; 1:e2  
doi:10.4081/idr.2009.e2

no occupational risk for CTS. Physical examination identified painful hyperesthesia in the rights wrist and forearm at the distribution of the median nerve, and positives Tinel (paresthesia painful strike to the distal wrist crease) and Phalen (paresthesia in the distribution of the median nerve to the dorsal flexion of the wrist at 90° to 60 seconds) signs. There were no signs of muscle atrophy or loss of tactile discrimination at the thenar eminence of the right hand. The Body Mass Index (BMI) was 23.8.

The blood analysis showed no abnormalities, the sedimentation rate (ESR) was 15 mm/h; C-reactive protein and rheumatoid factor were negative. There were no alterations in blood chemistry, including normal values of total CPK, LDH, TSH and FT4. His absolute CD4<sup>+</sup> T cell count was 234 cells/mm<sup>3</sup> and the Plasma Viral Load for HIV was 320 copies/mL. The radiographs of the cervical spine and cranium-spinal joint showed no bone abnormalities. The electrophysiological study of upper limb was considered diagnostic of CTS according to the criteria of Kimura *et al.* and Portillo *et al.* (Table 1).<sup>7,8</sup>

## Discussion

The prevalence of CTS in HIV positive individuals does not appear to be higher than in the general population. A Spanish study con-

ducted by Asensio *et al.* identified CTS in the 0.9% of HIV-infected patients.<sup>9</sup> In the United States, Márquez *et al.* described this medical condition in the 2.6% of 75 HIV-positive cases with HAART.<sup>10</sup> The 63% of adults with CTS attended in a rheumatic diseases clinic in Lusaka, Zambia had HIV infection.<sup>11</sup>

Several factors and clinical situations have arisen in the genesis of this syndrome (Table 2). Many of them, as some occupational activities, hypothyroidism, rheumatoid arthritis and obesity, are also mentioned in HIV-infected individuals.<sup>5,9,12</sup> Clinical observations published by Sclar and Manfredi related CTS with the HAART-associated metabolic syndrome particularly to PIs.<sup>5,13</sup> One explanation for this observation has been the myxedematous accumulation in the carpal tunnel and secondary compression of the median nerve.<sup>12</sup> Asensio *et al.* found no relation between the lipodystrophy secondary to PIs and CTS.<sup>9</sup> The patient did not have the above diseases and has not been receiving HAART when the CTS was diagnosed, therefore, as happened with other published cases, it would be hasty to establish association with HIV infection or HAART. There is a communication of CTS in HIV-positive individual treated with recombinant growth hormone.<sup>14</sup>

The patient had the typical clinical characteristics of the disease limited to the right hand and wrist, the characteristic pain with nocturnal worsening and paresthesias, which were partially relieved with the flapping of the hands (Flick sign). The electrophysiological study identified prolongation of motor and sensory distal latencies of the right median nerve and increase of the sensory conduction velocity exceeding 41.9 m/s, confirming the diagnosis. It was also found prolongation of the distal motor latency of left median nerve. The electrophysiological involvement of both median nerves in the absence of bilateral clinical manifestations has been described in several communications.<sup>1,7,8</sup>

The revised series highlights the high sensitivity of symptoms and clinical signs, over 90%.<sup>12</sup> Some authors have raised the lack of a gold test for the diagnosis of CTS, while others argue that the combination of clinical findings with electrophysiological abnormalities is sufficient for the diagnosis.<sup>15</sup> Although the clinical symptoms are not necessarily related with the severity of neurological impairment, the presence of atrophy is correlated with the most severe and significant alterations in the electro-physiological studies, indicating axon-myelinic damage.<sup>7</sup> Other clinical aspects such as Tinel and Phalen signs appear earlier and in the presence of suggestive electrophysiological findings help to the early diagnosis of the syndrome.<sup>7,15</sup>

Several studies included CTS among HIV-associated rheumatopathies and described

**Table 1. Electrophysiological study findings.**

Measurements	Right median nerve	Right cubital nerve	Left median nerve	Left cubital nerve
PML (mseg)	8.8	7.4	8.0	7.0
DML (mseg)	5.0	2.4	4.8	2.8
PMA (mseg)	9.9	6.2	9.2	6.3
DMA (mseg)	7.3	6.0	8.9	6.0
DSL (mseg)	4.4	2.0	3.6	2.1
MCV m/s	68.21	69.36	62.50	63.29
SCV m/s	44.62	41.2	41.8	41.4

L: latency, A: amplitude, M: motor, S: sensorial, CV: nerve conduction velocity, P: proximal, D: distal.

**Table 2. Diseases, clinical conditions and socio-occupational factors associated with carpal tunnel syndrome.**

Diseases, clinical conditions and socio-occupational factors	
I	Endocrine-metabolic Diabetes mellitus Hypothyroidism Acromegaly Obesity HAART-related metabolic syndrome
II	Rheumatologic and muscle-skeletal disorders Rheumatoid arthritis Carpal and metacarpal osteoarthritis Colles fracture Luxation of semilunar bone Cumulative trauma of the wrist Gout
III	Chronic infection Tuberculosis and other mycobacterial infections HIV/AIDS
IV	Chronic and inflammatory disorders Chronic renal failure and hemodialysis Amyloidosis
V	Occupational factors Office work Manufacturing Construction Healthcare personnel, nurses, home services and others
VI	Sports, sport climbing
VII	Other states and conditions Pregnancy Menopause Smoking Genetic factors Hormone therapy
VIII	CTS idiopathic (15%)

alterations of the ESR and C-reactive protein.<sup>10,12</sup> However, these findings were not identified in our patient, and it could depend on the few inflammatory components of the disease in the presented case. CTS associated to rheumatoid arthritis, amyloidosis, chronic renal failure, and infectious diseases like tuberculosis, might be related with acceleration of the ESR and increasing of inflammation markers.

The patient received many treatments with NSAIDs, which only slightly modified the symptoms. It was coordinated with the Neurosurgery Staff and surgery was performed. Surgical treatment is indicated for moderate and severe stages of the disease. It can be performed by conventional or endoscopic techniques, in both cases it consist in decompressing the median nerve through the opening of the flexor retinaculum.<sup>12</sup> There is

agreement among studies regarding the efficacy of surgery in the remission of clinical manifestations of CTS.<sup>12,16</sup> The patient had successful recovery and when this report was wrote (one year after surgery), he was absolutely asymptomatic and with no functional limitation of the hand.

## Conclusions

CTS can be diagnosed in HIV-positive patients with as similar frequency as in the general population. Based on current evidence, there is a controversial association among HIV infection, HAART and CTS, and probably does not represent a different phenomenon from what happens in HIV-negative population. However, the clinical recognition of the syndrome between the numerous neurological and muscle-skeletal disorders related with HIV infection and AIDS is important.

## References

1. Atroshi I, Gummesson C, Johnsson R, et al. Prevalence of carpal tunnel syndrome in a general population. *JAMA*. 1999;282:153-8.
2. Bongers FJ, Schellevis FG, van den Bosch WJ, van der Zee J. Carpal tunnel syndrome in general practice (1987 and 2001): incidence and the role of occupational and non-occupational factors. *Br J Gen Pract* 2007; 57:36-9.
3. Atroshi I, Gummesson C, Ornstein E, et al. Carpal tunnel syndrome and keyboard use at work: a population-based study. *Arthritis Rheum* 2007; 56:3620-5.
4. Atroshi I, Gummesson C, Johnsson R, et al. Prevalence for clinically proved carpal tunnel syndrome is 4 percent. *Lakartidningen* 2000;97:1668-70.
5. Sclar Gary. Carpal tunnel syndrome in HIV-1 patients: a metabolic consequence of protease inhibitor use? *AIDS* 2000; 14:336-8.
6. Woolley I, Faragher M, Spelman D. Association between HIV distal symmetric polyneuropathy and *Mycobacterium avium* complex infection. *J Neurol Neurosurg Psychiatry* 1997;63:557.
7. Kimura J. *Electrodiagnosis in diseases of nerves and muscle: principle and practice*. 2nd ed. Philadelphia: FA Davis Company; 1989; p.501-4.
8. Portillo R, Salazar M, Huertas MA. Síndrome del túnel del carpo: correlación clínica y neurofisiológica. *An Fac Med Lima* 2004;65:247-54.
9. Asensio O, Caso JA, Rojas R. Carpal tunnel syndrome in HIV patients? *AIDS* 2002; 16:948-50.
10. Marquez J, Restrepo CS, Candia L, et al. Human immunodeficiency virus-associated rheumatic disorders in the HAART era. *J Rheumatol* 2004; 31:741-6.
11. Njobvu P, McGill P. Soft tissue rheumatic lesions and HIV infection in Zambians. *J Rheumatol* 2006; 33:2493-7.
12. Lima AL, Zumioti AV, Camanho GL, et al. Osteoarticular complications related to HIV infection and highly active antiretroviral therapy. *Braz J Infect Dis* 2007; 11(4):426-9.
13. Manfredi R, Calza L, Chiodo F. Carpal tunnel syndrome in HIV-infected patients treated with highly active: other case reports. *Rheumatol Int* 2001;21:81-3.
14. Cominelli S, Raguso CA, Karsegard L, et al. Weight-losing HIV-infected patients on recombinant human growth hormone for 12 wk: a national study. *Nutrition* 2002; 18:583-6.
15. Rempel D, Evanoff B, Amadio PC, et al. Consensus criteria for the classification of carpal tunnel syndrome in epidemiologic studies. *Am J Public Health* 1998;88:1447-51.
16. Gerritsen AA, Uitdehaag BM, van Geldere D, et al. Systematic review of randomized clinical trials of surgical treatment for carpal tunnel syndrome. *Br J Surg* 2001; 88:1285-95.