

## Review Article

**Author Affiliation:** \*PG Student,\*\*Professor & Principal, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation (MMIPR), Maharishi Markandeshwar University (MMU), Mullana (Ambala), Haryana-133207

**Reprint Request: Senthil P Kumar,**

Professor & Principal, Maharishi Markandeshwar Institute of Physiotherapy and Rehabilitation (MMIPR), Maharishi Markandeshwar University (MMU), Mullana (Ambala), Haryana-133207 India

**Email:**senthilparamasivamkumar@gmail.com

# HIV/AIDS-associated Peripheral Neuropathy and Neuropathic Pain- a Complication or a Consequence?

**Nisha Rani Jamwal\*, Kumar Senthil P\*\***

## Abstract

This article was aimed to highlight the prevalence, risk factors, clinical presentation, management and self-care strategies for HIV/AIDS-induced neuropathy through an evidence informed overview of literature in PubMed. Studies show relatively higher prevalence rates for peripheral neuropathy ranging from 40-45% among people living with HIV/AIDS (PLWHA), with neuroanatomical changes in axons and myelin sheaths of peripheral sensory nerves, clinical presentation of distal symmetric polyneuropathy secondary to HIV infection and/or due to anti-retroviral therapy induced toxic neuropathy, with lower extremity splinting and various self-reported self-management strategies including application of local moist heat. The study findings are of immense importance to clinicians and researchers working on PLWHA in order to prevent, diagnose and treat HIV/AIDS-related neuropathy, so that multidimensional management could be planned to enhance quality of life of PLWHA.

**Keywords:** Neuroimmunology, Immunoneurology, HIV/AIDS-related neuropathy, HIV/AIDS-related pain.

This article was aimed to highlight the prevalence, risk factors, clinical presentation, management and self-care strategies for HIV/AIDS-induced neuropathy through an evidence informed overview of literature in PubMed.

### *Neuroanatomical changes*

Mezin et al<sup>1</sup> performed light and electron microscopic studies on neuromuscular biopsy specimens from 12 neurologically affected seropositive patients, 7 with the acquired immune deficiency syndrome (AIDS), 2 with AIDS-related

complex, and 3 with no symptoms except for neuropathy. The study had following findings; "All patients had an axonal injury associated or unassociated with demyelination and peripheral neurogenic atrophy. Capillary lesions were consistently present, which seems to be a new finding. Moreover, tubuloreticular inclusions (TRIs) were found in endomysial and endoneurial vessels."

### *Prevalence*

Nicholas et al<sup>2</sup> examined the prevalence of peripheral neuropathy in HIV-infected individuals and found 44% prevalence; with only 29.4% reporting initiation of self-care behaviors to address the neuropathy symptoms. "Antiretroviral therapy was found to increase the frequency of neuropathy symptoms, with an increased mean intensity of 28%. The study findings also revealed three distinct factors for self-care activities for neuropathy: "(i) an interactive self-care factor; (ii) a complementary medicine factor; and (iii) a third factor consisting of the negative health items of smoking, alcohol, and street drugs."

Biraguma and Rhoda<sup>3</sup> determined the prevalence of PN and its association with quality of life using the subjective PN screen and the World Health Organization Quality of Life Scale Brief Version respectively among 185 adults living with HIV/AIDS in Rwanda. The study found 40.5% prevalence of PN in PLWHA, and QoL scores were lower in physical and psychological domains for those with PN compared to those without.

### *Risk of Didanosine (ddl) use*

Zhu et al<sup>4</sup> developed ex vivo and in vivo models of Antiretroviral toxic neuropathy (ATN) induced by didanosine (ddI) following infection by the

lentivirus, feline immunodeficiency virus (FIV), and investigated neuronal morphology, neurobehavioural testing, viral load, mitochondrial and neurotrophic factor gene expression after ddI treatment of FIV-infected and uninfected animals or dorsal root ganglia (DRG) cultures. The study found that; "ddI treatment during FIV infection resulted in additive pathogenic effects contributing to the development of ATN, which was associated with mitochondrial injury on neurons and reduced BDNF production by Schwann cells in DRGs, highlighting the convergent pathogenic effects that antiretroviral drugs might have in patients with HIV infection."

#### *Risk of Nucleoside reverse transcriptase inhibitor use*

Dragovic and Jevtic<sup>5</sup> studied 112 HIV-infected patients on antiretroviral therapy with NRTI to examine the incidence of PN using medical records for each antiretroviral regimen that included zidovudine, zalcitabine, lamivudine, didanosine (ddI), stavudine (d4T) or didanosine+stavudine. Thirty-two cases of PN were recorded in their study, and the risk factors for PN included a low CD4 cell count and female sex. The study findings showed that "the risk of PN is almost twice as high when stavudine is used alone or in combination with didanosine."

#### *Clinical presentation*

Isezu et al<sup>6</sup> described the neurological manifestations of HIV/AIDS in northern Nigeria through a retrospective analysis of the demographic, clinical, neurologic and laboratory data of 322 HIV/AIDS patients. Fifty-one (15.8%) were found to have neurological complications dominated by central nervous diseases including encephalitis (17.6%), dementia (16.2%) and stroke (14.9%).

#### *Self-care strategies*

Nicholas et al<sup>7</sup> analyzed the prevalence and characteristics of peripheral neuropathy in HIV disease, sociodemographic and disease-related correlates and self-care strategies in 450 respondents and had following findings; "respondents with peripheral neuropathy identified 20 self-care behaviors including complementary therapies, use of medications, exercise and rest and/or elevation of extremities." Taking a hot bath was the most frequent strategy used by those with peripheral neuropathy and received the highest overall rating of effectiveness, other self-care strategies to manage this symptom included: staying off the feet, rubbing the

feet with cream, elevating the feet, walking, prescribed anti-epileptic agent, prescribed analgesics, over-the-counter medications, vitamin B, calcium supplements, magnesium, massage, acupuncture, reflexology and meditation. Several behaviors that are often deemed unhealthy were included among the strategies reported to alleviate peripheral neuropathy including use of marijuana, cigarette smoking, drinking alcohol and street drugs."

#### *Lower extremity night splinting*

Sandoval et al<sup>8</sup> studied 22 participants with a diagnosis of PN to assess the effects of using night splints for 3 weeks on pain and sleep quality. The change in pain scores and sleep index scores was found to be better following the use of night splints, without any additional effect of exercise.

Studies show relatively higher prevalence rates for peripheral neuropathy ranging from 40-45% among people living with HIV/AIDS (PLWHA), with neuroanatomical changes in axons and myelin sheaths of peripheral sensory nerves, clinical presentation of distal symmetric polyneuropathy secondary to HIV infection and/or due to antiretroviral therapy induced toxic neuropathy, with lower extremity splinting and various self-reported self-management strategies including application of local moist heat. The study findings are of immense importance to clinicians and researchers working on PLWHA in order to prevent, diagnose and treat HIV/AIDS-related neuropathy, so that multidimensional management could be planned to enhance quality of life of PLWHA.

#### **References**

1. Mezin P, Brion JP, Vermont J, Micoud M, Stoeber P. Ultrastructural changes associated with peripheral neuropathy in HIV/AIDS. *Ultrastruct Pathol.* 1991;15(6):593-602.
2. Nicholas PK, Voss J, Wantland D, Lindgren T, Huang E, Holzemer WL, et al. Prevalence, self-care behaviors, and self-care activities for peripheral neuropathy symptoms of HIV/AIDS. *Nurs Health Sci.* 2010;12(1):119-26.
3. Biraguma J, Rhoda A. Peripheral neuropathy and quality of life of adults living with HIV/AIDS in the Rulindo district of Rwanda. *SAHARA J.* 2012;9(2):88-94.
4. Zhu Y, Antony JM, Martinez JA, Glerum DM, Brussee V, Hoke A, et al. Didanosine causes

- sensory neuropathy in an HIV/AIDS animal model: impaired mitochondrial and neurotrophic factor gene expression. *Brain*. 2007;130(Pt 8):2011-23.
5. Dragovic G, Jevtovic D. Nucleoside reverse transcriptase inhibitor usage and the incidence of peripheral neuropathy in HIV/AIDS patients. *Antivir Chem Chemother*. 2003;14(5):281-4.
  6. Isezuo SA, Sani AZ, Ezunu E, Maiyaki S, Njoku CH, Obembe A. Clinical neuropathy in HIV/AIDS: an eight-year review of hospitalized patients in Sokoto, northwestern Nigeria. *Trop Doct*. 2009;39(3):133-5.
  7. Nicholas PK, Kemppainen JK, Canaval GE, Corless IB, Sefcik EF, Nokes KM, et al. Symptom management and self-care for peripheral neuropathy in HIV/AIDS. *AIDS Care*. 2007;19(2):179-89.
  8. Sandoval R, Runft B, Roddey T. Pilot study: does lower extremity night splinting assist in the management of painful peripheral neuropathy in the HIV/AIDS population? *J Int Assoc Physicians AIDS Care (Chic)*. 2010;9(6):368-81.

---

## Instructions to Authors

Submission to the journal must comply with the Guidelines for Authors.  
Non-compliant submission will be returned to the author for correction.

To access the online submission system and for the most up-to-date version of the Guide for Authors please visit:

<http://www.rfppl.co.in>

Technical problems or general questions on publishing with IJCD are supported by Red Flower Publication Pvt. Ltd's Author Support team (<http://www.rfppl.co.in>)

Alternatively, please contact the Journal's Editorial Office for further assistance.

Publication -in-Charge  
Indian Journal of Communicable Diseases  
Red Flower Publication Pvt. Ltd.  
48/41-42, DSIDC, Pocket-II  
Mayur Vihar Phase-I  
Delhi - 110 091  
India

Phone: 91-11-22754205, 45796900, Fax: 91-11-22754205  
E-mail: [redflowerppl@gmail.com](mailto:redflowerppl@gmail.com), [redflowerppl@vsnl.net](mailto:redflowerppl@vsnl.net)  
Website: [www.rfppl.co.in](http://www.rfppl.co.in)