ORIGINAL RESEARCH PAPER

Internal Medicine

KEY WORDS: HIV: Human immunodeficiency virus, PN: Peripheral neuropathy, WHO: World health organization, ARV: Anti-retroviral, ART: Anti-retroviral therapy, HAART: Highly Active Anti-Retroviral Therapy

"A STUDY ON THE CORRELATION BETWEEN CD4 COUNT AND PERIPHERAL NEUROPATHY IN HIV POSITIVE PATIENTS"

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ABSTRACT

Peripheral neuropathies represent the most prevalent neurological issues seen in individuals infected with HIV. Among these, distal symmetrical sensory neuropathy is the most frequently observed type and is notably associated with HIV infection and its treatment. In the era before antiretroviral therapy (ART), neuropathies were classified based on CD4 counts and HIV viral loads. In the initial phases of HIV infection, when CD4 counts are relatively high, inflammatory demyelinating neuropathies are more common. Conversely, in later stages, as CD4 counts decline, neuropathies related to opportunistic infections become more prominent. However, this situation has evolved with the widespread use of ART. Thanks to ART, individuals with HIV are living longer, which increases their risk for metabolic and age-related complications, along with potential neurotoxic effects from the therapy itself. Current studies indicate that approximately 57% of HIV-infected individuals experience distal symmetrical sensory neuropathy, while 38% report neuropathic pain. Therefore, it is essential to explore new strategies to address the ongoing neurological challenges that affect the quality of life for this population.

INTRODUCTION:

Although every part of the neuraxis with the exception of the neuromuscular junction is susceptible to HIV infection, the peripheral nervous system is one of the frequent targets and the most common neurologic problem. The major form of peripheral neuropathy in HIV disease is distal symmetric polyneuropathy (DSP).

Several other 11 peripheral neuropathy types are associated with HIV disease, mainly acute and chronic inflammatory demyelinating polyradiculoneuropathies (Guillain-Barre-like diseases), mononeuropathy multiplex (MM), progressive polyradiculopathy (PP), and autonomic neuropathy (AN).

Distal Symmetric Polyneuropathy Distal symmetric polyneuropathy affects over one third of patients with AIDS. It is rarely seen in children and is most common in the late stages of HIV disease. HAART (Highly Active Anti-Retroviral Therapy) lessens disease progression improves immunity, and significantly lowers risk of developing distal symmetric polyneuropathy.

Aims And Objective Of The Study:

- To analyze the relationship between CD4 count and peripheral neuropathy in HIV-AIDS patients.

Methodology:

A cross sectional study conducted on 150 patients of PLHIV admitted in hospitals attached to BMCRI.

Inclusion Critera:

1. All patients above 18yrs who are HIV positive and on treatment.
2. Patients with a known neurological disorder.
3. Patients on older regimens didanosine (ddI, Videx), zalcitabine (ddC, Hivid), and stavudine (d4T, Zerit)

Exclusion Criteria:

1. Patients who are not willing for study.
2. Patients diagnosed with TB and on treatment.
3. Patients using neurotoxic drugs like metronidazole, chemotherapy
4. Known diabetic patients on treatment.

Duration Of The Study: 18 months.

The study was undertaken after obtaining approval from the Institutional Ethics Committee and informed written consent from patients. Detailed history was taken, clinical examination; investigations (nerve conduction study) were done. Data was collected and analyzed using SPSS statistical software version 22.

RESULTS:

Age Distribution: Among patients under 40 years, 59.1% had peripheral neuropathy, compared to 66.1% who did not, out of a total of 93 patients in this age group (62% of the total sample). For those over 40 years, 40.9% had peripheral neuropathy, while 33.9% did not, from a total of 57 patients (38% of the total sample).

Sex Distribution: Among males, 53.4% had peripheral neuropathy, and 82.3% did not, making up 65.3% of the total sample (98 patients). For females, 46.6% had the condition, and 17.7% did not, representing 34.7% of the total sample (52 patients).

Prevalence Of Peripheral Neuropathy In Hiv Patients Based On Nerve Conduction Study: Out of 150 patients, 88 (58.7%) were diagnosed with peripheral neuropathy, while 62 (41.3%) did not show signs of the condition.

Distribution Based On Cd4 Count: Among those with a CD4 count below 185 cells/mm^3, 71.6% had neuropathy, and 33.9% did not, representing 56% of the total sample (84 patients). For those with a CD4 count above 185 cells/mm^3, 28.4% had neuropathy, and 66.1% did not, comprising

Distribution Based On Duration Since Hiv Diagnosed: For those diagnosed within the last 0-3 years, 4.5% had neuropathy, and 24.2% did not, representing 12.7% of the total sample (19 patients).

Among those diagnosed 4-6 years ago, 23.9% had neuropathy, and 41.9% did not, comprising 31.3% of the total sample (47 patients). For those diagnosed 7 years ago or

more, 71.6% had neuropathy, and 33.9% did not, making up 56% of the total sample (84 patients).

Distribution Based On Current Arv Regimen: Among those on a non-d4T-containing regimen, 27.3% had neuropathy, and 58.1% did not, representing 40% of the total sample (60 patients). For those on a d4T-containing regimen, 72.7% had neuropathy, and 41.9% did not, comprising 60% of the total sample (90 patients)

Distribution Based On Current Arv In Years: For those on ARVs for 0-1 years, 1.1% had neuropathy, and 19.4% did not, representing 8.7% of the total sample (13 patients). Among those on ARVs for 1-3 years, 6.8% had neuropathy, and 41.9% did not, comprising 21.3% of the total sample (32 patients). For those on ARVs for 4-6 years, 33% had neuropathy, and 33.9% did not, representing 33.3% of the total sample (50 patients). For those on ARVs for more than 7 years, 59.1% had neuropathy, and 4.8% did not, making up 36.7% of the total sample (55 patients).

Table 1: Prevalence of Peripheral neuropathy in HIV patients based on Nerve conduction studies

	Frequency	Percentage
Yes	88	58.7%
No	62	41.3%
Total	150	100%

Table 2: Distribution based on CD4 count

	Peripheral neuropathy				TOTAL	
	YES		NO			
	N	%	N	%	N	%
<185 cell/mm3	63	71.6%	21	33.9%	84	56.0%
>185 cell/mm3	25	28.4%	41	66.1%	66	44.0%
Total	88	100%	62	100%	150	100%

Table 3: Distribution based on om Duration since HIV diagnosed

	Peripheral neuropathy				TOTAL	
	YES		NO			
	N	%	N	%	N	%
0 – 3 years	4	4.5%	15	24.2%	19	12.7%
4 – 6 years	21	23.9%	26	41.9%	47	31.3%
7 years and above	63	71.6%	21	33.9%	84	56.0%
Total	88	100%	62	100%	150	100%

Table 4: Distribution based on current ARV regiment

	Peripheral neuropathy				TOTAL	
	YES		NO			
	N	%	N	%	N	%
Non d4T containing	24	27.3%	36	58.1%	60	40.0%
D4T containing	64	72.7%	26	41.9%	90	60.0%
Total	88	100%	62	100%	150	100%

Table 12: Distribution based on Duration of ARV in years

	Peripheral neuropathy				TOTAL	
	YES		NO			
	N	%	N	%	N	%
0 – 1 years	1	1.1%	12	19.4%	13	8.7%
1 – 3 years	6	6.8%	26	41.9%	32	21.3%
4 – 6 years	29	33.0%	21	33.9%	50	33.3%
>7 years	52	59.1%	3	4.8%	55	36.7%
Total	88	100%	62	100%	150	100%

DISCUSSION:

In the present study, the prevalence of peripheral neuropathy among 150 HIV patients was found to be 58.7%. The distribution of peripheral neuropathy based on age in the current study shows that younger patients (<40 years) have a higher prevalence (59.1%) compared to older patients (>40 years) who have a prevalence of 40.9%. The gender distribution of peripheral neuropathy in the current study reveals a higher prevalence among males (53.4%) compared to females (46.6%). patients with a BMI of less than 18.5 exhibited a higher prevalence of peripheral neuropathy (67%) compared to those with a BMI of 18.6–24.9 (29.5%) and 25–29.9 (3.4%). The current study shows a higher prevalence of peripheral neuropathy among patients with a CD4 count below 185 cells/mm^3 (71.6%) compared to those with a count above 185 cells/mm^3 (28.4%). The current study shows that patients diagnosed with HIV for 7 years or more have a higher prevalence of peripheral neuropathy (71.6%) compared to those diagnosed for 4-6 years (23.9%) and 0-3 years (4.5%). In the current study, patients on a d4T-containing regimen exhibited a higher prevalence of peripheral neuropathy (72.7%) compared to those on a non d4Tcontaining regimen (27.3%).

CONCLUSION:

In conclusion, this study contributes valuable insights into the prevalence and risk factors of peripheral neuropathy among HIV patients. The findings align with global research, indicating that demographic factors, nutritional status, and specific antiretroviral regimens significantly influence neuropathy risk.

These insights can inform healthcare providers in developing targeted strategies to prevent and manage peripheral neuropathy, ultimately improving the quality of life for HIV patients.

Enhanced screening, early diagnosis, and tailored treatment plans are essential to address this prevalent and debilitating condition effectively.

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