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Prevalence of and Risk Factors for Peripheral Neuropathy in Rakai, Uganda

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Background:

- Distal symmetric peripheral neuropathy (PN) is one of the most common neurologic complications of HIV.
- Prevalence of PN in AIDS patients in the West is ~35%.
- Few studies have systematically studied the prevalence of PN in Sub-Saharan Africa but estimates from these studies are as high as 50%.
- PN rates may vary significantly between resource-constrained settings and the West because of differing risk factors such as lower CD4 at the time of antiretroviral initiation, differences in diet and nutrition, differing medical comorbdities, variations in neurotoxic drug use, and differing HIV viral clades.

Objective:

Determine the prevalence of PN among antiretroviral-naive HIV+ adults in rural Uganda compared to age-, gender-, and community-matched HIV- adults.

Methods:

- A sample of participants from the Rakai Community Cohort Study underwent a detailed neurological evaluation including assessment of demographic factors and subjective PN symptoms and a neurological examination.
- PN prevalence was determined using this evaluation, and prevalence between groups were compared using t-tests.
- PN risk factors were determined by comparing characteristics of participants with and without PN using t-tests for continuous variables and chi-square tests for categorical variables.

Peripheral Neuropathy (PN) Definition: ≥1 exam sign AND ≥1 symptom

Symptoms: paresthesias, numbness or pain in hands or feet

Signs: decreased pinprick or vibration in fingers/toes, distal weakness, reduced ankle reflexes

Table 1. Demographic Characteristics

	Overall (n=538)	By HIV Status			By CD4 Count		
		HIV+ (n=307)	HIV- (n=231)	p	< 200 (n=107)	350-500 (n=200)	p
Male Gender [n (%)]	274 (51%)	158 (51%)	116 (50%)	0.8	**67 (62%)**	**91 (45%)**	**0.004**
Age (years) [mean (SD)]	35 (8)	36 (9)	35 (7)	0.2	**34 (7)**	**37 (9)**	**0.002**
BMI [mean (SD)]	22.4 (3.7)	22.2 (3.5)	22.8 (3.9)	0.06	**20.7 (2.5)**	**23.0 (3.7)**	**< 0.001**
Underweight [n (%)]	48 (9%)	24 (8%)	24 (10%)	0.3	**17 (16%)**	**7 (4%)**	**< 0.001**
Overweight/obese [n (%)]	98 (18%)	49 (16%)	49 (21%)	0.12	**3 (3%)**	**46 (23%)**	**< 0.001**
Narcotics use [n (%)]	10 (2%)	8 (3%)	1 (0.4%)	0.03	**7 (6%)**	**2 (1%)**	**0.006**
Alcohol use [n (%)]	259 (48%)	153 (50%)	106 (46%)	0.4	48 (45%)	105 (52%)	0.2
Diabetes [n (%)]	2 (0.4%)	0 (0%)	2 (1%)	0.1	0 (0%)	0 (0%)	1
Hypertension [n (%)]	10 (2%)	4 (1%)	6 (3%)	0.3	0 (0%)	4 (2%)	0.1
INH use [n (%)]	17 (3%)	10 (3%)	7 (3%)	0.9	2 (2%)	8 (4%)	0.3

Table 2. Neuropathy Prevalence and Severity

	Overall (n=538)	By HIV Status			By CD4 Count		
		HIV+ (n=307)	HIV- (n=231)	p	< 200 (n=107)	350-500 (n=200)	p
Neuropathy Prevalence	90 (17%)	**72 (24%)**	**18 (8%)**	**< 0.001**	32 (30%)	40 (20%)	0.05
Neuropathy Severity							
No neuropathy	236 (44%)	114 (37%)	122 (53%)	**0.003**	33 (31%)	81 (40%)	0.2
Mild neuropathy	296 (55%)	188 (61%)	108 (47%)		72 (67%)	116 (58%)	
Moderate neuropathy	5 (1%)	4 (1%)	1 (0.4%)		2 (2%)	2 (1%)	
Severe neuropathy	1 (0.2%)	1 (0.3%)	0 (0%)		0 (0%)	1 (0.5%)	

Table 3. Neuropathy Risk Factors

	OVERALL POPULATION (N=537)			HIV+ POPULATION (N=306)		
	Neuropathy (n=90)	No Neuropathy (n=447)	p	Neuropathy (n=72)	No Neuropathy (n=234)	p
Male gender [n (%)]	39 (43%)	234 (52%)	0.12	32 (44%)	125 (53%)	0.18
Age (years) [mean (SD)]	**38 (8)**	**35 (8)**	**0.03**	**38 (10)**	**35 (8)**	**0.01**
HIV Positive [n (%)]	**72 (80%)**	**234 (52%)**	**< 0.001**	----	----	----
CD4 count < 200 [n (%)]	32 (44%)	75 (32%)	0.05	32 (44%)	75 (32%)	0.05
BMI [mean (SD)]	22.7 (4.1)	22.4 (3.6)	0.45	22.2 (3.3)	22.2 (3.5)	0.92
Underweight [n (%)]	7 (8%)	41 (9%)	0.67	5 (7%)	19 (8%)	0.75
Overweight [n (%)]	15 (17%)	82 (18%)	0.71	10 (14%)	38 (16%)	0.63
Tobacco use [n (%)]	18 (20%)	56 (12%)	0.06	15 (21%)	29 (12%)	0.07
Alcohol use [n (%)]	45 (49%)	214 (48%)	0.78	35 (49%)	117 (50%)	0.84
History of diabetes [n (%)]	1 (1%)	1 (0.2%)	0.21	0 (0%)	0 (0%)	1
Neurotoxic medication [n (%)]	6 (7%)	15 (3%)	0.06	4 (6%)	9 (4%)	0.53

Discussion:

- PN is more prevalent among HIV+ than HIV- adults in rural Uganda and among HIV+ adults with advanced immunosuppression compared to those with moderate immunosuppression.
- Older age was a significant predictor of PN among HIV+ and HIV negative adults, but other common PN risk factors including alcohol use, prior neurotoxic medication use, and BMI were not significant.
- Moderate to severe PN was rare among both HIV+ and HIV- adults, although moderate PN seemed to be more prevalent among the HIV+ cohort.

Conclusions:

- PN is prevalent in rural Uganda which highlights the need for early diagnosis and treatment of this potentially debilitating condition.
- Close monitoring for PN is essential as the HIV+ population ages in this region as PN prevalence increased with age.

References:

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