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Original Research Paper

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HIV NEUROPATHY DRUG NAIVE PLHA PATIENTS AND IT'S CORRELATION WITH GLYCEMIC STATUS IN CENTRAL INDIA.

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ABSTRACT The sensory neuropathies are still prevalent as the most frequent neurological disorder associated with HIV infection and its treatment with ART. There are two major types of HIV-associated distal sensory peripheral neuropathies: primary HIV-associated distal sensory polyneuropathy (HIV-DSP) and ART toxic neuropathy (ATN), together which affect approximately 30–67% of patients with advanced HIV disease.

AIM: association of HIV neuropathy & its correlation with glycemic status.

MATERIAL & METHODS: After obtaining prior ethical clearance, treatment naïve PLHA (person living with HIV/acquired immunodeficiency syndrome (AIDS)) patients were included in the study and we carried out a cross-sectional study of the HIV seropositive patients in inpatient and outpatient clinic of the Gandhi Medical College, Bhopal, from December 2011 to December 2012.

RESULTS: Impaired fasting glucose was significantly higher in neuropathy group by NCS examination (61.9%) than non-neuropathy group (31.2%), p=0.009 . Impaired glucose tolerance is significantly higher in clinical neuropathy group (75.9%) than non-neuropathy group (28.3%), p=0.009.

CONCLUSION : The dysglycemia is more common in the hiv patients and both dysglycemia and hiv associated with neuropathy or hiv patients are more prone to dysglycemia.

KEYWORDS : Human Immunodefeciency Virus , Plha , Nerve Conduction Study . Dysglycemia.

INTRODUCTION :

The sensory neuropathies are still prevalent as the most frequent neurological disorder associated with HIV infection and its treatment with ART [1-3]. Ellis *et al.* [4] reports that distal sensory polyneuropathy is prevalent (57%) in the cART era. There are two major types of HIV-associated distal sensory peripheral neuropathies: primary HIV-associated distal sensory polyneuropathy (HIV-DSP) and ART toxic neuropathy (ATN), together which affect approximately 30–67% of patients with advanced HIV disease [5,6]. The pathology of HIV-DSP involves a length-dependent degeneration of both small and large peripheral nerve fibers but the pathogenesis is unknown [6,7,8]. The pathogenesis of ATN is believed to reflect inhibition of gamma DNA polymerase by nARTs leading to reduced mitochondrial DNA content and therefore to mitochondrial dysfunction [9]. Reduced mitochondrial DNA levels in subcutaneous fat obtained by punch skin biopsies have been associated with ATN [10,11]. The signs/symptoms of HIV-DSP and ATN resemble common neuropathies encountered in clinical practice including diabetic and alcohol-associated neuropathy. Diabetes mellitus is a common cause of sensory neuropathy, and ART therapy, especially protease inhibitors, is associated with diabetes mellitus [12]. The interaction between metabolic syndrome and HIV is unclear.

AIMS :

association of HIV neuropathy & its correlation with glycemic status .

MATERIAL & METHODS

After obtaining prior ethical clearance, treatment naïve PLHA (person living with HIV/acquired immunodeficiency syndrome (AIDS)) patients were included in the study and we carried out a cross-sectional study of the HIV seropositive patients in inpatient and outpatient clinic of the Gandhi Medical College, Bhopal, from December 2011 to December 2012.

Patients on antitubercular therapy, on antiretroviral therapy, alcoholic, vitamin B-12 deficiency, leprosy, chronic kidney disease, and with hereditary neuropathy were excluded from the study.

The diagnosis of HIV was made according to National AIDS Control Program Guidelines.[13] Consecutively, each patient underwent a BPNS using the BPNS tool.[14] History and lower extremity examination was done to evaluate patient perception of vibrations for over 10 s using a 128 Hz tuning fork on the big toe. Ankle reflexes were also tested using a reflex hammer. Sociodemographic and anthropometric information relevant to the study were also obtained from each patient. Fasting blood glucose obtained after 8 hour fast in the morning and postprandial plasma glucose was obtained 2 hour after 82.5 g oral glucose load.

STATISTICAL ANALYSIS:

Unpaired *t*-test & chi-square test was used to compare the quantitative variables of interest under study namely; mean hemoglobin, mean body mass index (BMI), mean serum albumin, and mean CD4 T-cell count between clinically evident neuropathy and non-neuropathy group. HIV-SN was defined as the presence of symptoms and at least abnormal perception of vibration or ankle reflex or both. Evidence of association was considered for a two-sided *P* value of less than 0.05.

RESULTS :

Total number of patients were 75 in number and had mean age , mean weight mean BMI were 33.11±10.45 year , 50.69±9.14 and 18.51±2.71 respectively (table 1). Mean fasting blood glucose was 98.16±14.794 and post 75 g OGTT value were 138.52±19.63.(table1).

Table : 1 Baseline characteristics

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	75	18	60	33.11	10.454

WEIGHT	75	34	82	50.69	9.143
FBS	75	67	124	98.16	14.794
75 OGTT	75	102	188	138.52	19.634
HEIGHT	75	145	178	165.29	8.160
BMI	75	13	27	18.51	2.713

The neuropathy was present with both impaired fasting glucose and impaired postprandial glucose load and thre was significant difference among fasting (p<0.001) in patient with neuropathy with similar significance level in the post prandial glucose.(table02). : Both FBS and 75 OGTT were significantly higher in Neuropathy present group than non-neuropathy group as determined by unpaired t-test.

Table:02 Neuropathy(NCS) and dysglycemia					
Study Variable	Neuropathy by NCS Examination	N	Mean	Std. Deviation	p
FBS	Present	42	103.74	13.520	<0.001
	Absent	32	90.69	13.422	
75 OGTT	Present	42	146.45	20.502	<0.001
	Absent	32	128.03	12.855	

Both FBS and 75 OGTT were significantly higher in clinical neuropathy present group than non-neuropathy group as determined by unpaired t-test.(TABLE03)

Table :03 CLINICAL NEUROPATHY					
	Clinical neuropathy	N	Mean	Std. Deviation	p
FBS	Present	29	106.83	11.793	<0.001
	Absent	46	92.70	13.944	
75 OGTT	Present	29	149.41	19.778	<0.001
	Absent	46	131.65	16.304	

Impaired fasting glucose is significantly higher in neuropathy group by NCS examination (61.9%) than non-neuropathy group (31.2%), p=0.009 as determined by chi-square test.(Table:04)

TABLE 04 :Neuropathy by NCS Examination * IFG Crosstabulation						
			IFG		Total	p
			Absent	Present		
Neuropathy by NCS Examination	Present	Count	16	26	42	0.009
		%	38.1%	61.9%	100.0%	
	Absent	Count	22	10	32	
		%	68.8%	31.2%	100.0%	
Total		Count	38	36	74	
		%	51.4%	48.6%	100.0%	

Impaired glucose tolerance is significantly higher in neuropathy group (61.9%) than non-neuropathy group (25%), p=0.009 as determined by chi-square test.(table05)

Table:05 Neuropathy by NCS Examination * IGT Crosstabulation						
			IGT		Total	p
			Absent	Present		
Neuropathy by NCS Examination	Present	Count	16	26	42	0.002
		%	38.1%	61.9%	100.0%	
	Absent	Count	24	8	32	
		%	75.0%	25.0%	100.0%	
Total		Count	40	34	74	
		%	54.1%	45.9%	100.0%	

Impaired glucose tolerance is significantly higher in clinical neuropathy group (75.9%) than non-neuropathy group (28.3%), p=0.009 as determined by chi-square test.

DISCUSSION :

In the our study 56.7 % patients had abnormal nerve conduction study with both impaire fasting plasma glucose as well as with impaired glucose tolerance . Impaired fasting glucose was significantly higher in neuropathy group by NCS examination (61.9%) than non-neuropathy group (31.2%). The clinical neuropathy was present in the 38.8% of the patient with dysglycemia.

Diabetes reflected by insulin use also predicts less chance for reversal of symptomatic neuropathy, suggesting that combining the diabetic risk with nART-induced mitochondrial deficits may be a particularly troublesome neurotoxic situation. Early studies emphasized CD4 and viral load as risk factors, but with successful therapy these associations have become less important. Specifically viral suppression did not decrease the odds of peripheral neuropathy.

Although neuropathy was more common in the PLHA patient with dysglycemia but it is difficult to comment on the etiology of neuropthy because both HIV and dysglycemia causes neuropthy & also PLHA patient are prone to dysglycemia .

CONCLUSION :

The dysglycemia is more common in the hiv patients and both dysglycemia and hiv associated with neuropathy or hiv patients are more prone to dysglycemia.

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CONFLICT OF INTEREST : None .

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