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SERUM LIVER TRANSAMINASES AND ANTIOXIDANT VITAMINS STATUS AMONG THE HIV PATIENTS IN DUTSE METROPOLIS, JIGAWA-NIGERIA

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ABSTRACTS

Human immunodeficiency virus (HIV) has principally been considered the main cause in the progression of acquired immunodeficiency syndrome (AIDS). Induced lipid peroxidation by ROS plays critical role in the pathogenesis of HIV. The current study aimed at evaluating some serum antioxidant vitamins and liver enzymes in HIV and control subjects. In this research, serum antioxidant vitamins (A, C and E) levels were estimated in 51 HIV seropositive and 25 apparently healthy individuals as controls in Rasheed Shekoni specialist Hospital Dutse, Jigawa-Nigeria. Serum levels of vitamin A, C and E in HIV subjects were (25.81±3.06 µg/dl), (0.345±0.10 mg/dl) and (0.28±0.15 mg/dl) respectively, and that of controls were (61.7±6.4 µg/dl), (0.76±0.1) and (0.43±0.06 mg/dl) respectively. The serum liver transaminases of HIV were statistically ($p<0.05$) higher than the control subjects. Antioxidant deficiencies reflect oxidative stress which precipitated the progression of HIV/AIDS, Oral supplementation of antioxidant vitamins may suppress the oxidative damage and limits HIV progression and complications.

KEY WORDS: *Antioxidant Vitamins, Oxidative stress, HIV/AIDS, Liver transaminases*

INTRODUCTION

Human immunodeficiency virus 1 and 2 are retroviruses belonging to the family Retroviridae which develop to a systematic disease condition known as Acquired Immune Deficiency Syndrome (AIDS), they are RNA-containing viruses that replicate with the help of the reverse transcriptase (RT) (Japaya, 2007). AIDS became global epidemic with an estimated mortality of 20 million and additional 36 million people living with its causative agent- Human Immunodeficiency virus (HIV) (Piot *et al.,* 2001). It has been reported severally that oxidants plays an important role in the genesis of AIDS and therefore administration of antioxidant reducing agents could reverse the mechanism responsible for AIDS progression (Papadopulos-Eleopulos *et al.,* 1988; Papadopulos-Eleopulos 1989). Several studies studies reported the potential use of antioxidants to suppress HIV expression (Scheib, *et al,* 1987; Bitterlich, *et al.,* 1989). Antioxidants are substances that prevent free radical induced damage by averting the formation of radicals, morphing them off or causing their decomposition within the biological system (Jaruga, *et al.,* 2002) An overwhelming increase in radicals compared to antioxidants with consequent pro oxidants/antioxidants imbalance results in a condition called oxidative stress (Anthony and Ashok, 2011). There is, however, dearth of information with respect to the antioxidant vitamins status of HIV positive subjects in Jigawa, Nigeria. The current research aimed to reports the serum levels of antioxidant vitamins of HIV subjects from Jigawa, Nigeria.

MATERIALS AND METHODS

Study Population:

The study comprises of Fifty one (51) HIV Seropositive patients (29 males and 22 females) attending HIV Clinic in Rasheed Shekoni Specialist Hospital Dutse, and twenty five (14 males and 11 females) age-matched apparently healthy sero negative individuals as control. The consent was sought and obtained from the subjects before inclusion in the study.

Specimen Collection:

About five milliliters (5mls) samples were collected from each participants using standard venopuncture. It was allowed to clot, centrifuged and separated. The sera were stored at -20^{0}c until used for analysis.

CD4 Estimation:

CD4 cell count was measured in accordance with flow cytometry method using Cyflow Counter (Partec, Germany).

Human immunodeficiency virus screening:

The screening of HIV subjects was done in accordance with HIV national algorithm using three different test kits; Determine HIV1/2 rapid screening test kits, Unigold and Stat Pak kit.

Antioxidant Vitamins Determination:

Vitamin A was estimated using method of Bassey *et al.,* (1964), Vitamin C was determined in accordance with procedure described by Roe and Keuther, (1943) and finally vitamin E was analyzed using the method Neil and Pearson, (1963).

Statistical analysis:

Values were presented as Mean±Standard Deviation, The Biochemical parameters were statistically analyzed using one way analysis of variance followed by comparison using Graphad Instat Software. Differences were considered as significant when $P<0.05$

RESULTS

Table 3.1.Age and sex distribution of Serum levels of Antioxidant Vitamins in HIV and Control Subjects

Parameters	HIVS			CNTRL S		
	Male(n=29)	Female(n=22)	Pool (n=51)	Male (n.14)	Female (11)	Pool (n=25)
Vitamin A(µg/dl)	26.13±2.95	25.4±3.21	25.81±3.06	60.8±6.4	62.3±5.5	61.7±6.4
VitaminC(mgdl)	0.351±0.04	0.34±0.16	0.345±0.10	0.75±0.1	0.73±0.2	0.76±0.1
VitaminE(mg/dl	0.27±0.17	0.28±0.20	0.28±0.15	0.44±0.05	0.43±0.06	0.43±0.06

CNTRLS= Control subjects; n=number of subjects

Table 3.2. Serum levels of some liver enzymes and CD4 counts among HIV and Control subjects.

Parameters	HIVS		CNTRLS	
	Male(n=29)	Female(n=22)	Male(n=14)	Female(n=11)
CD4	452.3±219	556.7±241	935±244	930±205
ALT	33.8±14.0	37.5±13.82	9.75±2.4	9.5±3.1
AST	60.90±31.0	51.1±50.1	15.6±5.0	14.3±5.5

HIVS=HIV subjects; CNTRLS= Control subjects; n=number of subjects; ALT=Alanine amino transferase; AST= Aspartate amino transferase

Table 3.3. Percentage of HIV Seropositive subjects with Antioxidant Vitamins Deficiencies*

Parameters	Subjects		
	Male(n=29)	Female (n=22)	Pool (n=51)
Vitamin A	82.8%	79.3%	89.7%
Vitamin C	90.9%	81.8%	90.9%
Vitamin E	86.3%	80.4%	90.1%

*Values in table 1.0. Of the mean control value were used as the reference
HIVS=HIV subjects; CNTRLS= Control subjects; n=number of subjects.

DISCUSSION

Human immunodeficiency virus (HIV) has principally been considered the main cause in the progression of acquired immunodeficiency syndrome (AIDS). In this study, the serum ALT and AST levels are higher in all HIV cases as compared to the controls. This tally with several findings including that of Subir *et al.,* (2013) and Saheed *et al.,* (2016). Being liver the major part of reticulo endothelial system and is a site of HIV replication and organ for many opportunistic infections in HIV infected individuals, abnormal biochemical test results can developed as a result of hepatic parenchymal disease. The transaminases (alanine aminotransferase and aspartate aminotransferase) are enzymes found in the liver. When liver cells are damaged, these enzymes leaked into blood stream (Ivan *et al.,* 2009). Micronutrient deficiencies among HIV seropositive subjects has long been reported, subsequent opportunistic infections, faster progression and death due to HIV/AIDS were also documented (Kupka, 2002; Srinivas and Dias, 2008). The results of the current research revealed a decrease in ($p<0.05$) Vitamin A of HIV infected subjects when compared to the control groups, similar results were observed by Bilbis *et al.,* (2010). The decrease may be due to consequent oxidative damage caused by free radicals. Drains *et al.,* (2007), however, reported normal levels of Vitamin A among persons living with HIV (PLWH). Serum levels of Vitamin E and C were significantly ($p<0.05$) lower in HIV subjects compared to the control groups, the decrease is as a results of increased free radicals generation causing excessive utilization of these vitamins in counteracting the consequent oxidative damage. Depletion of micronutrients in HIV- infected population has been reported and remains one of the major contributing factors to the progression of AIDS which leads to impaired immune responses, weaken epithelial integrity. Low levels of vitamin A could be as a result of malnutrition and poverty rate in the study area or non adherence to antiretroviral treatments which helps improves their immune systems. Vitamin C in this study is also lower in the test when compared to the control. Similar decrease was reported by Lawal *et al.,* (2010).

CONCLUSION

In conclusion, there is considerable reduction in the serum antioxidant vitamins and elevated liver transaminases in HIV infected subjects as these hasty the danger of HIV complications and progression to AIDS.

RECOMMENDATION

Having established the facts that antioxidant vitamins are deficient among the HIV infected individuals, moderate supplementation may prevent the oxidative damage through scavenging ROS.

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