Levels of Tumor Markers in Human Immunodeficiency Virus Patients: Results of a Pilot Study

Dear Editor,

Human immunodeficiency virus (HIV)-infected patients are at higher risk of development of cancers including Kaposi sarcoma, Hodgkin's and non-Hodgkin lymphoma, and cancers in different organs.[1,2] Though antiretroviral therapy (ART) increases life expectancy, it in turn increases the number of patients and increased risk of malignancy. Hence, cancer screening is essential for HIV patients.

For cancer screening and observing prognosis after treatment, several nonspecific tumor markers of blood such as carcinoembryonic antigen (CEA), carbohydrate antigen 19-9 (CA 19-9), and prostate-specific antigen (PSA) are used. However, data regarding screening HIV patients before and after ART are inadequate. Therefore, this pilot study (IRB/BSMMU/2010/12167-A) was conducted among HIV patients, which have two study components, i.e., cross sectional and prospective [Table 1]. In the cross-sectional part, three groups of study participants were assayed for the levels of the above-mentioned tumor markers in blood. The groups were as follows: Group I: HIV patients with CD4 T-cell count (cells/μl) >350 (n = 16; male: female = 8:8), Group II: HIV patients with CD4 T-cell count <350 (n = 24; male: female = 12:9), and Group III: HIV patients on ART for 2 years (n = 19; male: female = 12:7). In the prospective part, the Group II was screened again after 3 months of ART (n = 21; male: female = 12:9). The tumor markers, CD4/CD8 T-cells, and viral loads were measured by chemiluminescence immunoassay (IMMULITE®, Germany), flowcytometry (FACSCount, BD Biosciences, USA), and real-time polymerase chain reaction (Applied Biosystems, USA), respectively.

Among the tumor markers, the median value of CEA was higher in Group II (median interquartile range [IQR]; 2.0 [1.4, 3.9]) compared to Group I (median [IQR]; 1.1 [0.9, 1.4]) and Group III (median [IQR]; 1.1 [0.9, 2.0]). This shows that the advanced stage of HIV disease may be linked to higher levels of CEA, and long-term use of ART improves the condition and reduces CEA level. No significant difference, however, was observed in PSA and CA 19.9 levels across the groups. Though paired comparison between before and after 3-month ART revealed no significant difference in any of the tumor markers, 5 (20.8%) and 6 (25%) HIV patients of Group II had abnormal level of CA 19-9 and CEA before initiation of ART, and in the prospective part of the study, only

Table 1: Levels of tumor markers among human immunodeficiency virus patients categorized according to their CD4 T cell count and anti-retroviral therapy status

	Cross-sectional component[#]				Prospective component*[Ω]		
	Group-I (n=16)	Group-II (n=24)	Group-III (n=19)	K-W[a] χ^2, P[@]	Group-II Before ART (n=21)	Group-II 3 months after ART (n=21)	Z, P[@]
PSA (ng/ml) normal range: 0.16-1.7 (ng/ml)							
Median (IQR)	0.6 (0.7-1.1)	0.6 (0.4-0.8)	0.8 (0.6-9.9)	3.35, 0.187	0.6 (0.42-0.78)	0.7 (0.52-1.04)	−0.782, 0.434
Patients with abnormal PSA level (%)	1 (6.25)	0 (0)	1 (5.26)	-	0 (0)	0 (0)	0 (0)
CA-19.9 (u/ml) normal range: Up to19.3 (u/ml)							
Median (IQR)	3.8 (1.0-5.9)	5.5 (2.5-12.4)	4.1 (2.5-9.2)	2.73, 0.256	5.5 (2.5-12.4)	3.3 (2.5-7.2)	−1.752, 0.080
Patients with abnormal CA-19.9 level (%)	0 (0)	5 (20.8)	1 (5.2)	-	3 (14.2)	1 (4.7)	-
CEA (ng/ml) normal range: Up to 5.0 (ng/ml)							
Median (IQR)	1.1 (0.9-1.4)	2.0 (1.4-3.9)	1.1 (0.9-2.0)	8.03, 0.018	2.0 (1.4-2.0)	1.7 (1.1-2.2)	−0.973, 0.330
Patients with abnormal CEA level (%)	0 (0)	6 (25)	1 (5.2)	-	5 (23.8)	1 (4.7)	-

[#]Kruskal-Wallis test, *Nonparametric Wilcoxon signed ranks test, [@]P<0.05 was considered as significant, [Ω]During the study period, among the Group-II patients, 2 died and 1 lost in the follow up. Therefore, they were not included in the prospective component of the study. IQR: Interquartile range, CEA: Carcinoembryonic antigen, ART: Anti-retroviral therapy, PSA: Prostate-specific antigen, CA-19.9: Carbohydrate antigen 19-9

4.8% patients had abnormal level of CA 19-9 and CEA after 3 months of ART. During the study period, two patients with elevated CA 19-9 and CEA died and one lost in follow-up. Though the change in CEA level was not apparent 3 months after ART, the level found comparable to the level of Group I after 2 years of ART, suggesting a potential role of prolonged use of ART in reducing CEA level. An elevated level of CEA in AIDS patients with *Pneumocystis carinii* pneumonia was reported previously.[3] Although the elevated levels of CA 19-9 and PSA were reported in AIDS patients, the present study contradicts those findings.[4,5]

Though lack of power was one limitation of this pilot study, findings of this study indicate a requirement of future study on a large population of HIV patients to see if there is any change in tumor markers in disease and therapy.

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Conflicts of interest

There are no conflicts of interest.

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