Prevalence of vitamin D deficiency among perinatally HIV-infected Thai adolescents receiving antiretroviral therapy

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Background: Osteopenia and osteoporosis has been observed frequently in HIV-infected adolescents. Vitamin D deficiency may be a contributing factor. We aimed to determine the prevalence of vitamin D deficiency among perinatally HIV-infected Thai adolescents who were receiving antiretroviral therapy (ART).

Methods: A cross-sectional study was performed in adolescents with perinatal HIV infection. Vitamin D level, parathyroid hormone and calcium were measured in blood. Vitamin D deficiency was defined as levels of 25-(OH)- vitamin D below 20 ng/ml and insufficiency as 20-30 ng/ml. The information of dietary consumption and sunlight exposure were collected by self report structured questionnaire.

Results: 101 adolescents, 50% male, median age 14.3 (range, 12.0-19.5) years, were enrolled. Median (IQR) duration of ART was 83.9 (52.2-104.2) months. 90% of children had plasma HIV RNA < 50 copies/ml in the past 6 months. The median vitamin D level was 24.8 (range, 6.9-46.9) ng/ml. Twenty-five patients (25%) had 25-(OH)- vitamin D level < 20 ng/ml and twenty-nine patients (29%) had level of 20-30 ng/ml. The median parathyroid hormone was 44 (range,15.4-121.6) ng/L. Patients with vitamin D deficiency had higher parathyroid hormone level [13.3(3.2-55.6),P < 0.001]. There was no significant difference in serum calcium level or hours of exposure to sunlight between the patients with or without vitamin D deficiency.

Conclusion: Half of the HIV-infected adolescents were found to have insufficiency or deficiency of vitamin D. Preventive measures should be included in routine care.

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Comparison of anti-HIV-1 neutralizing activity between the plasma derived from HIV-1 infected, slow and rapid progressors

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Background: Neutralizing antibodies (NAb) are a critical component of the protective immunity required for developing an effective HIV-1 vaccine; however, an HIV-1 vaccine has not been succeeded. Plasma of some HIV-1-infected patients contains potent and broadly reactive NAb, and the understanding of how such antibodies are elicited may provide valuable insights to develop effective HIV-1 vaccine. CRF01_AE, a major CRF, accounts for more than 80% of HIV-1 infections in Thailand. Envelope glycoprotein (Env) is a major target of anti-HIV-1 neutralizing antibodies, but has a high level of inter-subtype heterogeneity; therefore, the humoral immune responses against Env potentially vary among different HIV-1 subtypes and CRFs.

Methods: In order to study the impact of humoral immune response to HIV-1 CRF01_AE Env on the course of disease progression, we examined an anti-HIV-1 neutralizing activity of plasma derived from 34 slow (CD4 >100 cells/cm3 at the time of enrollment, healthy at least 8 years without antiretroviral treatment) and 33 rapid (CD4 >100 cells/cm3 at the time of enrollment, died with AIDS symptom within 5 years) progressors residing in northern Thailand. High throughput neutralization test was performed using CRF01_AE Env-recombinant, luciferase reporter viruses.

Results: The level of neutralizing activity varied considerably among patients plasma, and no clear differences in potency and breadth of anti-HIV-1 neutralizing activity was observed between the plasma derived from rapid and slow progressors. However, plasma derived from 4 slow progressors showed neutralizing activity against all recombinant viruses tested, whereas none of plasma from rapid progressors showed such a broadly neutralizing activity. The broadly neutralizing plasma derived from 4 slow progressors did not show strong neutralizing activity to clade B and clade C Env clones.

Conclusion: Although no clear differences in the extent of anti-HIV-1 neutralizing activity was observed between the plasma derived from rapid and slow progressors, some of slow progressor-derived plasma showed CRF01_AE specific broadly neutralizing activity. These results suggest that anti-HIV-1 humoral immune responses affect, at least in part, on the disease progression. We plan to examine the epitopes of neutralizing antibodies in these patients' plasma with a broad and potent neutralizing activity.

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