Evgeny Vlad. Butorov, J Antivir Antiretrovir 2014, 6:2
http://dx.doi.org/10.4172/1948-5964.S1.022

OMICS Group Conferences
Accelerating Scientific Discovery

4th World Congress on
Virology

October 06-08, 2014 Hilton San Antonio Airport, TX, USA

Influence of L-lysine amino acid on the HIV-1 RNA replication in vitro

Evgeny Vlad. Butorov
Russian

Background: Amino acids play an important role in the pathogenesis of all virus-related infections both as basic substrates for protein synthesis and as regulators in many metabolic pathways, including gene expression. Although the same interrelation between host cellular factors and HIV have been recognized for a long time, the effects of amino acids on viral load dynamic is not yet well documented.

Objective: Our aim was to determine in this pilot study the direct effect of L-lysine on HIV-1 RNA replication in vitro in HIV-infected patients.

Design and setting: Case-control study performed in the Municipal Center of HIV/AIDS prophylaxis, Surgut, Russian Federation.

Subjects: A total of 115 HIV-infected males in stage A of HIV-infection.

Methods: We used a model of amino acid-excess system in vitro following incubation of plasma samples for 24 hours at 25°C. Quantitative HIV-1 RNA assay was performed using (RT-PCR) reverse-transcriptase polymerase chain reaction.

Results: We observed that HIV-1 RNA levels in HIV-infected patients was markedly increased by L-lysine amino acid supplementation in vitro. The increased viral load in plasma samples was found in 100/92 (92%) of HIV-infected subjects before HAART, and in 30/14 (47%) persons after HAART. The average number of HIV-1 RNA copies had increased by 5.0 times or from 70,000 to 350,000 copies/ml in comparison with standard samples ($P<0.0001$). However, we found no difference in HIV-1 RNA levels after replacement of L-lysine for L-arginine in comparison samples in the same HIV-infected patients. It is obvious that the addition of L-arginine does not increase viral replication in vitro as L-lysine amino acid supplement does.

Conclusions: The study results show that there was evidence for an association between L-lysine supplementation and the quantity of HIV-1 RNA copies in plasma samples. We suppose that level changes of this host essential nutritional element play a key role in the synthesis of the virus proteins and in transcription initiation of the retrovirus life cycle. High intake of this amino acid may increase the risk of high viral load, subsequent acceleration of immunosuppression and disease progression. Although the impact mechanism of L-lysine on the viral load in the pathogenesis of HIV-infection is at present conjectural and requires further development, our findings and bold conclusions may be, in fact, a promising target for a new vector in antiviral therapy of patients with human immunodeficiency virus.

butorov888@gmail.com