KnE Life Sciences
ISSN 2413-0877 Volume 2 (2015) 484-486
The 3rd International Conference on Biological Science 2013
(The 3rd ICBS-2013)

TORQUE TENO VIRUS/TOXOPLASMA/HIV TRIPLE INFECTION DETECTED IN HIV PATIENTS IN MOEWARDI GENERAL HOSPITAL SURAKARTA, INDONESIA

Hartono[1], Ruben Dharmawan[2], Dhani Redhono[3], and Afiono Agung Prasetyo[4,5,6*]

[1] Department of Physiology Faculty of Medicine, Sebelas Maret University,
Jl. Ir. Sutami 36A, Surakarta, Indonesia.
[2] Department of Parasitology Faculty of Medicine, Sebelas Maret University,
Jl. Ir. Sutami 36A, Surakarta, Indonesia.
[3] Department of Internal Medicine, Faculty of Medicine, Sebelas Maret University,
Jl. Ir. Sutami 36A, Surakarta 57126, Indonesia.
[4] Biomedical Laboratory Faculty of Medicine, Sebelas Maret University, Jl. Ir. Sutami 36A, Surakarta, Indonesia.
[5] Department of Microbiology Faculty of Medicine, Sebelas Maret University,
Jl. Ir. Sutami 36A, Surakarta, Indonesia.
[6]Center of Biotechnology and Biodiversity Research and Development, Sebelas Maret University,
Jl. Ir. Sutami 36A, Surakarta, Indonesia.
* Correspondence author: Afiono Agung Prasetyo, M.D., Ph.D. Department of Microbiology Faculty of Medicine, Sebelas Maret University Jl. Ir. Sutami no 36A, Surakarta, Indonesia, Telp. 62-271-632489, Fax. 62-271-632489, E-mail: afieagp@yahoo.com; afie.agp.la@gmail.com

ABSTRACT

Torque Teno Virus infection (TTV) was reported increase in human immunodeficiency virus (HIV)-infected patients who are progressing toward AIDS (Acquired Immunodeficiency Syndrome). Toxoplasmosis is considered one of the opportunistic infections for individuals with AIDS, and is also a major cause of morbidity and mortality. However, there is no report about the presence of triple infection of TTV/Toxoplasma/HIV in Indonesian HIV patients. Aim of this study is to determine the TTVToxoplasma/HIV infection status in HIV patients in Moewardi General Hospital Surakarta, Indonesia. Blood samples from 51 HIV patients in Moewardi General Hospital Surakarta were collected in November 2011. The blood samples were aliquoted and fractionated. Plasma was used for IgM anti Toxoplasma and IgG anti Toxoplasma detection using ELISA. The nucleic acid was extracted from all plasma samples, and then subjected for Torque Teno Virus DNA detection using nested PCR assay. The positive results were confirmed by sequencing of the PCR products. The IgM anti Toxoplasma and IgG anti Toxoplasma were positively detected in 23.5% (12/51) and 11.8% (6/51) HIV patients, respectively. Torque Teno Virus DNA was detected in 25.5% (13/51) patients. Three HIV patients co-infected with Torque Teno Virus were IgM anti Toxoplasma positive (5.9%, 3/51). This results indicate the need for adequate management of HIV patients, especially in the incident of triple infection of TTV/Toxoplasma/HIV.

Key words: Torque Teno Virus, Toxoplasma, HIV, Indonesia.

INTRODUCTION

Reports suggests the increase of Torque Teno Virus (TTV) replication in human immunodeficiency virus (HIV)-infected patients who are progressing toward AIDS. A high TTV viral load was associated with a low CD4 cell count, indicating a potential role of the immune system in controlling TTV replication (Thom & Petrik, 2007). Although it remains unclear the role of the immune system in the natural of TTV infection, TTV may act as an opportunistic pathogen (Pifferi *et al.*, 2008; Maggi & Bendinelli, 2009). Toxoplasmosis already known as an opportunistic infections in HIV/AIDS patients. Prior to antiretroviral therapy, toxoplasmosis could induce cerebral lesion in AIDS patients (Nissapatorn, 2009). Moreover, cerebral toxoplasmosis reported in Indonesia (Ganiem *et al.*, 2013; Yunihastuti *et al.*, 2005) indicating the need to diagnose Toxoplasmosis in HIV-infected patients. The presence of triple infection of

Selection and Peer-review under responsibility of the 3rd ICBS-2013
Doi http://dx.doi.org/10.18502/kls.v2i1.197

TTV/Toxoplasma/HIV as well as TTV in Indonesian HIV patients have not been published yet.

MATERIALS AND METHODS

In November 2011, 51 blood samples were collected from HIV patients in Moewardi General Hospital Surakarta. The ethical approval was obtained from the institutional ethical committee review boards of the Faculty of Medicine of Sebelas Maret University and Dr. Moewardi General Hospital, Surakarta, Indonesia. Blood samples were fractionated, aliquoted and kept frozen until further analysis. All procedures were conducted according to the principles of the Declaration of Helsinki. The blood plasma was separated from whole blood with EDTA and subsequently was subjected to the DRG *T. gondii* IgM Elisa Kit (DRG International, Inc., Springfield, NJ) and DRG *T. gondii* IgG Elisa Kit (DRG International, Inc.) following to the manufacturer's instructions. All samples were tested in duplo. Viral nucleic acid was extracted using the PureLink Viral RNA/DNA Kit (Invitrogen, Carlsbad, CA) according to the manufacturer's instructions. TTV-DNA was detected by nested PCR as described previously (Irshad *et al.*, 2008). Molecular detection was performed by PCR using the Amplitaq Gold® 360 DNA Polymerase Kit (Invitrogen). Internal amplification controls were included to exclude any false negative results. The corresponding positive controls and one negative control (sterile water) were included in every assay. To prevent PCR contamination, the reagent preparation, sample processing and nested PCR assays were performed in rooms separate from those where the amplified products were analyzed. Aerosol-resistant pipette tips were used throughout the assays. The PCR products were subjected to electrophoresis in 2% agarose gels, which were stained with ethidium bromide and visualized under ultraviolet illumination. The specificity was confirmed by sequencing the amplicons. All samples were at least conducted two times.

RESULTS AND DISCUSSION

All HIV patients (31 women and 20 men) of Voluntary Counseling and Testing in Dr. Moewardi General Hospital Surakarta Indonesia was participated in the study. The average of age of the patients was 33.7 years (range 21-72 years). The mean of T Helper CD4+ absolute counts was 447 cells/ul. All respondents received antiretroviral therapies. The IgM anti Toxoplasma and IgG anti Toxoplasma were positively detected on 23.5% (12/51) and 11.8% (6/51) HIV patients, respectively. By nested PCR, TTV DNA was detected in 25.5% (13/51) patients. Three HIV patients (5.9%, 3/51) were co-infected with TTV and Toxoplasma. All HIV patients co-infected with TTV were positive for IgM anti Toxoplasma. The TTV and Toxoplasma infection in HIV patients may influence the HIV immunopathogenesis. TTV is believed weaken the host's defense mechanisms against other noxae and/or alter the way the organism reacts to them, for example by keeping baseline levels of inflammation elevated, so that the superimposed noxae deal with an already compromised, although subclinical, state of affairs (Maggi & Bendinelli, 2009). Therefore, the presence of TTV in HIV patients may increase the rapid spreading of Toxoplasma. Toxoplasma itself has ability to decrease the production of Interleukin-12 and Interferon Gamma, and immunomodulate the host immune response (Laliberté & Carruthers, 2008). However, the mechanism on how

TTV and or Toxoplasma influence the host immune response, and wether any influence in pathogenesis, especially in patients infected with HIV remains unclear. In fact, our group research is working on this issues.

ACKNOWLEDGMENT

This work was supported partially by grants from the Indonesian Directorate of Higher Education (No. 077/SP2H/PL/Dit.Litabmas/V/2013), and from APBN/DIPA UNS (No. 2342/UN27.16/PN/2012 and No. 267a/UN27.16/PN/2013).

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