

Toxoplasma gondii, HBV, and HCV co-infection and their correlation with CD4 cells among Iranian HIV-positive patients

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Abstract

Introduction: Human immunodeficiency virus (HIV/AIDS) infected patients have a higher risk of opportunistic infections (OIs) depending on their immunological status, especially CD4 + cell count. Toxoplasma gondii, hepatitis C virus (HCV), and hepatitis B virus (HBV) are important OIs among Human Immunodeficiency Virus (HIV)/Acquired Immune Deficiency Syndrome (AIDS) patients. However, little is known about co-infection of these pathogens among HIV-infected individuals and their correlation with the patient's CD4 + cell count. Hence, this study aimed to investigate the serological and molecular status of T. gondii infection among HIV-infected individuals who had co-infection with HBV and HCV infections.

Methods: A total of 100 HIV/AIDS patients in two cities in the southwest of Iran was tested for T. gondii Immunoglobulin G (IgG) and Immunoglobulin M (IgM) antibodies as well as DNA detection by polymerase chain reaction (PCR) targeting the RE gene. HBV and HCV were detected by hepatitis B surface antigen (HBsAg) test, hepatitis C antibody (HCV Ab) test, and Real-Time PCR. The number of CD4 + cell counts was determined by Flow cytometry.

Results: Anti-T. gondii IgG was positive in 22% of the patients, but anti-T. gondii IgM and PCR were negative in all samples. HBV and HCV were positive in 8% and 33% of the patients, respectively. Co-infections were as followed: HIV + HCV (16%), HIV + HCV + T. gondii (11%), HIV + T. gondii (5%), HIV + HBV (1%), HIV + HBV + T. gondii (1%), HIV + HBV + HCV (1%), and HIV + HBV + HCV + T. gondii (5%). A significant decline in CD4 + cell counts was found in such co-infection groups (HIV + T. gondii, HIV + HCV + T. gondii, and HIV + HBV + HCV + T. gondii) compared with the HIV mono-infection group.

Conclusions: Our study showed that co-infections of T. gondii, HCV, and HBV were common among HIV-infected patients and co-infections had a negative correlation with CD4 + cell counts of the patients.

Keywords: CD4, hepatitis B, hepatitis C, HIV/AIDS, Iran, T cell, toxoplasmosis