INCREASED B7-H1 AND CTLA-4 EXPRESSIONS ON T LYMPHOCYTESUBSETS OF PATIENTS DURING CHRONIC HBV INFECTION

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Abstract

Background: Upon hepatitis B virus infection, the virus clearance relies on many arms of the immune response, including protective neutralizing antibodies against HBV surface antigen (HBsAg), virus antigen-specific responses of T helper cells and cytolytic T lymphocytes, and antiviral cytokines. In addition, a number of costimulatory and inhibitory molecules play a prominent role in regulating T cell responses. T cells can express a diverse array of both costimulatory and inhibitory molecules, which depending on the type of pathogen. These molecules can positively or negatively regulate T cell function. Since during a chronic infection like HBV, balancing between activation and inhibition of immune response is tightly regulated, the surface molecules which are most likely govern the outcome of HBV infection are investigated

Objectives: This study was to investigate the role of T cell response to HBV infection.

Methods: Peripheral blood specimens from chronic HBV infected patients and healthy donors were obtained in EDTA tubes. Whole blood was incubated with monoclonal antibodies specific to CD3, CD4, CD8, CD274 and CD152 (Bio-legend, San Diego CA). After incubation, the erythrocytes were lysed with FACS lysing solution (BD Bioscience). The peripheral blood mononuclear cells (PBMCs) were washed, fixed and analyzed on a BD Biosciences flow cytometer FACSCalibur) by using the CellQuest software. Statistical analysis was performed with GraphPad (Prism Version 5.0). Mann-Whitney U-test was used tocompare the difference between two subject roups. Difference was considered significant when the p-value was less than 0.05. This study was approved by the Ethical Committee of Srinakharinwirot University.

Results: The quantitative analysis of T-lymphocyte subset was expressed as the percentage of total lymphocytes which were gated on FSC and SSC plot. The mean percentages of CD274 bearing CD3, CD4 and CD8 from chronic HBV-infected subjects were 0.6, 0.3 and 0.5, respectively. Comparison to those from healthy, the mean frequencies were 0.4, 0.1 and 0.1, respectively. Focus on CD152, the mean frequencies of CD3, CD4 and CD8 expressing CD152 of infected patients were 1.2, 0.5 and 0.5, respectively. In parallel, the mean frequencies of lymphocyte subsets from healthy were 0.7, 0.3 and 0.2, respectively. Significant differences in thepercentages of all categories of lymphocytes between HBV infected patients and healthy subjects were observed ($p<0.01$).

Conclusion: A small proportion of T- lymphocytes express B7- H1 (CD274) molecules on their surface. The number of lymphocyte expressing B7-H1 ($CD274^+$) in peripheral blood of patient with chronic HBV-infection is significantly higher than those from healthy. The frequencies of CD152 bearing $CD4^+$ and $CD8^+$T-lymphocyte are increased significantly during HBV infection.

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