

A Whole Blood Lymphocyte Proliferation Assay in Healthy Thais: Comparison of Heparinized Blood and Acid Citrate Dextrose Blood

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Abstract

Background: The lymphocyte proliferation assay (LPA) is a technique to determine T-lymphocyte Functions in vitro. The standard LPA using peripheral blood mononuclear cells (PBMC) separated from heparinized blood requires a large blood sample, time consuming and expensive. It is more useful if acid citrate dextrose (ACD) blood could be used not only for LPA but also for other purposes.

Objectives: To determine whether whole blood composing between heparinized blood and ACD blood could be substituted for standard LPA using PBMC.

Methods: Heparinized and ACD blood of 35 healthy Thai blood donors were studied herein. PBMC separated by density gradient centrifugation and diluted heparinized and ACD blood were used to test and compare for lymphoproliferative responses to phytohemagglutinin (PHA), pokeweed mitogen (PWM), and tetanus toxoid. A stimulation index (SI) for each mitogen or antigen was calculated.

Results: All Thai blood donors demonstrated positive proliferative responses to PHA and PWM by using PBMC and whole blood culture assays from both heparinized and ACD blood. However, the difference in the frequency of positive proliferative responses to tetanus toxoid by using PBMC and whole blood culture assays was significant. Nevertheless, no significant difference in frequency of positive responses to tetanus toxoid between heparinized and ACD blood was observed. This results suggested that no significant difference between using heparinized and ACD blood in standard LPA using PBMC. However, the whole blood LPA for measuring mitogen induced lymphoproliferation could be substituted for standard LPA from heparinized and ACD blood.

Conclusion: Whole blood LPA is easy, rapid, and more cost effective than PBMC culture. Thus, it would be applicable in a clinical laboratory as well as in research setting.

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