

3836030 RACP / M : MAJOR: CLINICAL PATHOLOGY; M. Sc. (CLINICAL PATHOLOGY

KEY WORD : FLOW CYTOMETRIC ANALYSIS / HEAT-INDUCED ERYTHROCYTE FRAGMENTATION TEST / ANEMIA / THALASSEMIA / IRON DEFICIENCY

YUPIN JOPANG: IN *VITRO* MODIFICATION OF RED CELL AND CYTOMETRIC ANALYSIS FOR CLASSIFICATION AND DIFFERENTIAL DIAGNOSIS OF ANEMIA. THESIS ADVISOR: AHNOND BUNYARATVEJ, Ph. D., SUPORN CHUNCHARUNEE, M.D. 163 p. ISBN 974-588-926-1

Red cell analysis is used for detection and classification of anemia by new technology of flow cytometric analysis. The study included red blood cell (RBC), hemoglobin (Hb), mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), red blood cell distribution width (RDW), hemoglobin distribution width (HDW), cell hemoglobin concentration mean (CHCM), cell hemoglobin distribution width (CHDW), percentage of microcyte, percentage of macrocyte, percentage of hypochromic red cell, percentage of reticulocyte, mean corpuscular volume of reticulocyte (MCV_r), cell hemoglobin content of reticulocyte (CH_r), and cell hemoglobin concentration mean of reticulocyte (CHCM_r). This study has linked red cell morphology and pathophysiology of anemia using these parameters. RBC-shape transformation test and heat-induced erythrocyte fragmentation test could be applied to aid in the differential diagnosis of anemia. The combination of these tests is useful for gaining better resolution on anemia diagnosis.

Cell hemoglobin distribution width parameter could identify patients who had either depleted iron storage and iron deficient subjects with non thalassemic conditions and from those with thalassemia trait as well. Decreased cell hemoglobin content of reticulocyte in iron deficient erythropoiesis was an indicator of progress to iron deficiency anemia. In the cases with " mixed " etiology, it is interesting to know the direction of red cell alteration. From this study, differentiation of normal from thalassemia disease and thalassemia trait was 100%, iron deficient erythropoiesis 87.2%, iron deficiency anemia 100%, and G6PD deficiency (no clinical manifestation) 92.9%.