INITIATION OF APPROPRIATE SCREENING TESTS FOR SEVERE THALASSEMIA PREVENTION AT COMMUNITY LEVEL IN CAMBODIA.

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Introduction: The prevalenceof thalassemia in Southeast Asia are α^0-thalassemia, α^+-thalassemia, β^0-thalassemia, hemoglobin (Hb) E and Hb Constant Spring. In Cambodia, the reported prevalence of α-thalassemia was 30-40%, β-thalassemia 0.8-1.1% and Hb E 13.9-33.1%. We aim to set up an appropriate severe thalassemia screening program for prevention and control of severe thalassemia in communities in Phnom Penh, Cambodia. **Methods:** Blood samples were obtained from 170 out of 241 participants aged 18-40years old as a part of the research study on "The effect of health education on severe thalassemia prevention and control program in communities in Phnom Penh, Cambodia". Osmotic fragility (KKU OF-test) was conducted at the field. Hb analysis by cellulose acetate electrophoresis and re-confirmed with capillary electrophoresis in some suspected cases to have high percentage of Hb A_2, and standard DNA analysis were used to determine the prevalence and type of severe thalassemia carrier which is the main objective of prevention and control of severe thalassemia diseases. **Results:** We found as high as 120 (70.6%) were KKU-OF positive but only 1 (0.58%) case of α^0 - thalassemia (SEA) deletion, 2 (1.17%) Hb E homozygous, 50 (29.4%) Hb E trait. No β-thalassemia was found in this study according to Hb A_2 level was between 2.2% - 3.0% after confirmed with capillary electrophoresis. **Conclusions:** Severe thalassemia carriers were not high in this study and it was confirmed by the other recent community-based study. Therefore, it will be cost effective to initiate the laboratory facilities to detect α^0-thalassemia and β^0-thalassemia among individuals and couples in Cambodia. Laboratory strategy for severe thalassemia prevention and control program in Cambodia might be different from other countries that have high prevalence of α^0-thalassemia and β^0-thalassemia.

ANALYSIS OF CHYLOMICRONS IN BLOOD BY SCANNING FLOW CYTOMETRY

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Introduction: Recent studies confirm that chylomicrons (CMs) could play an important role in pathogenesis of such diseases as atherosclerosis, diabetes, and disorders associated with the metabolic syndrome. Characteristics of CM, including concentration, amount of associated exogenous triglycerides (TGs), and dynamics of their postprandial elimination from blood circulation, may serve as novel diagnostic and prognostic markers for these disorders. Rigorous verification of these statements is needed; however, clinical investigations are hampered by the lack of methods providing detection and characterization of CMs in blood. Here we demonstrate the capabilities of the scanning flow cytometry to fill this gap. **Methods:** Scanning flow cytometry allows measuring angle-resolved light-scattering patterns (LSPs) for individual particles in flow, in contrast to standard measurements of only forward- and side-scatter intensities (FS and SS). The significant amount of scatter information contained in measured LSPs allows one to solve the inverse light-scattering (ILS) problem recovering such particle characteristics as shape, size, and refractive index (RI). We applied our previously developed algorithm to separate and characterize platelets and spherical submicron particles in platelet-rich plasma, obtained by simple precipitation, and identified individual CMs by their spherical shape and RI. Determination of individual particle characteristics with high accuracy (~30 nm for size and 0.01 for RI) allow not only to identify CMs in plasma, but also to estimate the amount of carried TGs. **Results:** Analysis of postprandial dynamics of CM characteristics of a healthy donor studied for 6h after a meal demonstrated the expected behavior: initial growth of both CM concentration and total amount of carried TGs, reaching maximum at 3-4h after the meal, and their decrease afterwards. Size and RI distribution of individual CMs did not change significantly. This dynamics correlated with the results of standard biochemical analysis of TGs. We also performed comparative study of CMs after fasting for healthy donors and donors diagnosed with risk of atherosclerosis. The latter showed increased level of CMs in agreement with impaired elimination of CMs commonly associated with this disease. **Conclusions:** The presented method of scanning flow cytometry provides identification of CMs in platelet-rich plasma and their precise characterization by size and RI. The method can be applied for clinical studies of the role of CMs in pathogenesis of different diseases, including atherosclerosis.

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