Newly developed profiling of lipoproteins by PAGE to determine the heterogeneity of low-density lipoproteins (LDLs)

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Aim: To explore the potential of newly developed polyacrylamide-gel disc electrophoresis (PAGE) for lipoprotein profiling in clinical practice. Design and Methods: Blood samples were collected from 95 patients with metabolic syndrome. Lipid parameters were assayed by commercial (Lipophor) and newly developed PAGE (Lipophor AS), including small, dense low-density lipoprotein (LDL) (n = 41), and triglyceride-rich lipoprotein remnant cholesterol (n = 37). We also used a commercial kit to measure small, dense LDL (n = 41). Results: By PAGE, we obtained the percentage of the area under the curve (AUC %) of each peaks and calculated respective AUC% x total cholesterol (AUC% xTC) values. The calculated values of LDL-AUC% xTC, small LDL-AUC% xTC, and HDL-AUC% xTC values were correlated well with values from homogeneous assay for LDL-cholesterol, small, dense LDL-cholesterol, and HDL-cholesterol assays (r = 0.94, 0.81, and 0.89, respectively). Lipophor AS is better correlation between TG and VLDL than Lipophor (r = 0.77, and 0.85, respectively). Conclusions: PAGE combined with measurement of total cholesterol and triglycerides provides a rapid evaluation of anti- or pro-atherogenic lipoproteins and a simple profiling system for both the "quantity" and "quality" of lipoproteins, allowing a better assessment of the risk of coronary artery diseases.