

Cardiometabolic Risk Factors Assessed by a Finger Stick Dried Blood Spot Method

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Abstract

Background:

Cardiovascular and metabolic risk factors are gaining attention as potential indicators for intervention in the prevention and treatment of cardiovascular disease (CVD) and type 2 diabetes mellitus (T2DM). Blood spot technology offers an efficient, convenient method to measure these risk factors in an at-risk population. Simple and convenient methods to assess cardiometabolic risk factors will allow clinicians to formulate treatment strategies for effective prevention and management of these conditions.

Method:

Insulin and high sensitivity C-reactive protein (hs-CRP) were measured in dried blood spot and corresponding serum samples using conventional commercial serum kits based on a direct sandwich ELISA technique. The triglyceride assay involved enzymatic hydrolysis of triglycerides by lipase to glycerol and free fatty acids. The glycerol produced was then measured by coupled enzyme reactions. Blood spot assays were modified from previously published methods to give improved accuracy and turnaround time.

Results:

Blood spot levels correlated well with serum levels of hs-CRP ($r = 0.99$), triglycerides (fasting, $r = 0.95$; nonfasting, $r = 0.94$), and insulin (fasting, $r = 0.93$; nonfasting, $r = 0.97$).

Conclusion:

Blood spot testing for insulin, hs-CRP, and triglycerides may be helpful in the cardiometabolic screening or monitoring of patients at risk of developing CVD, T2DM, or metabolic syndrome.

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Abbreviations: (CRP) C-reactive protein, (CV) coefficient of variation, (CVD) cardiovascular disease, (hs-CRP) high sensitivity CRP, (PBS) phosphate-buffered saline, (RBC) red blood cell, (T2DM) type 2 diabetes mellitus

Keywords: assay method, automated, blood spot, cardiometabolic panel, cardiovascular disease, CRP, C-reactive protein, dried blood spot, hs-CRP, high sensitivity CRP, insulin, metabolic syndrome, risk factors, screening, triglycerides, type 2 diabetes

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