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THE PREVALENCE OF ELEVATED INFLAMMATORY BIOMARKERS AMONG PERSONS AT LOW TO MODERATE RISK OF CHD BY TRADITIONAL RISK FACTORS AND CORONARY CALCIUM SCORING

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Background: Cardiovascular heart disease (CHD) is the leading cause of morbidity and mortality in the United States today. In primary disease prevention, estimation of future CHD risk is based on Framingham risk calculations. While traditional risk factors are helpful in predicting risk, it is well documented in the literature that many individuals suffer events in the absence of established risk factors and population risk estimations lack precision when applied to an individual. The combination of coronary artery calcium scoring and traditional risk factor assessment has been shown to improve CHD risk prediction in adults; primarily among persons at moderate risk (Framingham 10-year risk between 10 – 19%) and when calcium scores are in excess of 300 volume units.

Recent literature has reported that lipoprotein-associated phospholipase A2 (Lp-PLA2) mass and high sensitivity C reactive protein (hs-CRP), two novel inflammatory biomarkers, are independent predictors for cardiovascular disease. To our knowledge, no studies exist which have examined the prevalence of elevated levels of these biomarkers among persons at low to moderate Framingham risk with coronary calcium score levels less than 300 volume units.

Purpose: The purpose of this study was to determine the prevalence of elevated levels of Lp-PLA2 and hs-CRP among persons at low to moderate risk for CHD based upon traditional risk factor assessment and coronary calcium score levels.

Subjects: One hundred apparently healthy individuals who had previously participated in a heart disease risk screening were included in the analysis. All individuals included in this study were determined to have a Framingham risk score less than 20% with a coronary calcium score less than 300 volume units.

Methods: Framingham risk determinations were performed using previously published risk factor calculations. Variables in the Framingham risk factor model included age, gender, total cholesterol, HDL cholesterol, smoking status, systolic blood pressure and history of anti-hypertensive medication. Coronary calcium measurements were completed utilizing 64 slice CT scanning. Lp-PLA2 was determined by an FDA approved ELISA assay (PLACTM test, diaDexus, Inc.), whereas hs-CRP was quantified using an immunoturbidimetric assay.

Results: This study revealed that among the group examined, 23% had elevated levels of Lp-PLA2 (>200 ng/mL) while 46% had elevated levels of hs-CRP (>2 mg/L). Finally, 16% of the group had elevated levels of both inflammatory biomarkers.

Conclusion: This study demonstrated a high prevalence of Lp-PLA2 mass and hs-CRP among persons at low to moderate CHD risk. These biomarkers offer the opportunity to more appropriately identify CHD risk over and above traditional risk factors and coronary calcium scoring assessment.