ORIGINAL ARTICLE

Plasma Haptoglobin as A Potential Biomarker for Coronary Artery Disease in Young Hypertensive Adults

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ABSTRACT

INTRODUCTION: Uncontrolled hypertension is one of the recognized risk factors for coronary artery disease (CAD) in young adults, commonly underestimated owing to the young age. A novel biomarker to improve CAD risk assessment and hypertension management should be identified for this cohort. Thus, we had conducted a study to investigate plasma concentration and the role of haptoglobin in young hypertensive adults in the establishment of premature acute myocardial infarction (AMI). **MATERIALS AND METHODS:** A total of 120 male adults aged between 18 to 45 years enrolled into this cross-sectional study, divided into control, hypertensive, and acute myocardial infarction (AMI) groups. Blood samples were collected from all subjects, plasma concentrations of haptoglobin measured using enzyme-linked immunosorbent assays, and other CAD risk factors including high sensitivity C-reactive protein (hs-CRP) levels were analyzed. **RESULTS:** Plasma concentration of haptoglobin in the AMI group was the highest compared to hypertensive and control group (290.63±99.90 vs. 208.47±112.93 vs. 170.02±108.11 ng/ml, p<0.006). There was a significant association between AMI and plasma haptoglobin concentration in hypertensive subjects independent of other known CAD risk factors (OR: 0.985, 95% CI 0.973-0.997, p=0.017). There was positive correlation between plasma haptoglobin and hs-CRP (r=0.0370, p<0.001). **CONCLUSION:** Plasma haptoglobin is a potential biomarker to identify young hypertensive adults who are at risk of developing CAD.

Keywords
Haptoglobin, Biomarker, Coronary Artery Disease, Hypertension, Young Adults

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INTRODUCTION

Acute myocardial infarction is the commonest clinical presentation of coronary artery disease (CAD) primarily affecting older individuals. However, there has been a recent increase in the incidence of acute myocardial infarction (AMI) in young adults, indicating that being young is no longer a protective factor against CAD.[1-2] A cut-off age of 45 years is commonly used to define young AMI in many studies.[3-8] Young AMI patients predominantly were male and hence, the diagnosis of AMI at this productive age has significant socioeconomic consequences, including the loss of valuable human capital, an increased financial burden on the nation, and a strain on limited public health care resources.[5-8] The Fourth Universal Definition of myocardial infarction defines AMI as myocardial ischemia followed by myocardial necrosis with an increase and/or decrease in plasma troponin level, accompanied with prolonged chest pain, or/and abnormal electrocardiography (ECG) changes.[9] The diagnosis of ST-elevation myocardial infarction (STEMI) is based on the presence of myocardial necrosis identified by elevation of ST segment in ECG tracing while non ST elevation myocardial infarction (NSTEMI) is when there is no ST-elevation in ECG tracing, yet there is an elevation of troponin. The third category is unstable angina which refers to myocardial ischemia without myocardial necrosis as the troponin value is below the decision limit for AMI. Aside from smoking, hypertension is recognized as a main risk factor for AMI development in young adults.[10-15] Unfortunately, young adults experiencing their first AMI are more likely to have