Association of Alpha-1-Acid Glycoprotein (AGP) with hsCRP: A marker of chronic inflammation and pro-inflammatory diet in adult women in the US

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Chronic diseases are commonly associated with chronic inflammation (CI). hsCRP is a well-established marker of CI, while α-1 acid glycoprotein (AGP), extensively studied in acute inflammation, remains understudied as a potential marker of CI. This analysis of secondary data was aimed at identifying AGP as a potential marker of CI by studying the association of AGP with hsCRP, and other factors associated with chronic inflammation. A dataset of the National Health and Nutrition Examination Survey, from August 2021-2023 was used for secondary data analysis. The dataset contained waist-circumference (WC), body mass index (BMI), hsCRP and AGP and two-day dietary recalls; from which mean percentage energy from sugars (TS), carbohydrates, fats, saturated fats, total energy and dietary fiber (DF) were calculated. Multivariate linear regression analysis was used to investigate the relationship between variables correlated with AGP. Receiver Operated Characteristic Curves (ROC) were used to determine an AGP cut off for CI using established cut offs for hsCRP. The dataset included 683 female participants aged 20-49. AGP significantly ($p<0.001$) correlated with hsCRP. AGP and hsCRP were significantly ($p<0.001$) correlated with TS, DF, WC, and BMI. Linear regression showed WC was positively, and DF was negatively correlated with AGP, corrected for TS. ROC curves showed AGP as a predictor of CI between the hsCRP range 3 mg/L to 7 mg/L. The AGP cut off obtained for CI was most sensitive and specific at an hsCRP cutoff of 4 mg/L where the AGP value obtained was 889.5 mg/L. This analysis suggests that AGP is a potential marker of CI, being most predictive at an hsCRP cut off of 4 mg/L. AGP correlated with WC, BMI, DF which are other factors associated with CI. This analysis highlights the need for further investigation and validation of AGP as a chronic inflammatory marker against other markers of CI.

Keywords: *Chronic inflammation, α-1 acid glycoprotein, High sensitivity C-reactive protein, Dietary fiber*, *Waist circumference*