HEPATIC STEATOSIS IS ASSOCIATED WITH ATEROGENIC DYSLIPIDEMIA INDEPENDENT OF OBESITY, COMPONENTS OF THE METABOLIC SYNDROME, MEDICATION USE, AND SYSTEMIC INFLAMMATION.

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Background: Hepatic steatosis has been associated with the metabolic syndrome. Studies suggest that hepatic steatosis plays a direct role in increasing cardiovascular risk via its role as a substrate for increased triglyceride-rich VLDL production. We sought to identify an independent association between hepatic steatosis and atherogenic dyslipidemia after adjusting for obesity, components of the metabolic syndrome, medication use and systemic inflammation.

Methods: We evaluated 6,333 individuals without coronary heart disease between November 2008 and July 2010. Hepatic steatosis was diagnosed by ultrasound and obesity was defined as BMI ≥30kg/m2 or gender-specific waist circumference when BMI >25kg/m2. Atherogenic dyslipidemia was defined as 1) criteria for metabolic syndrome (TG ≥150mg/dL and HDL-C <40mg/dL in men or <50mg/dL in women) and 2) TG/HDL-C ≥2.5 in women and ≥3.5 in men. Multivariable regression analyses were used to assess associations of hepatic steatosis with atherogenic dyslipidemia.

Results: The mean age of the study population was 43±10 years, mean BMI was 26±4 and 21% were women. 36% of participants had hepatic steatosis. Subjects with steatosis had similar LDL-C, yet lower HDL-C and higher TG levels compared to those without. Importantly, hepatic steatosis was independently associated with dyslipidemia criteria of metabolic syndrome (OR 2.47; 95%CI 2.03-3.02) and elevated TG/HDL ratio (OR 2.50; 95%CI 2.13-2.91) after multivariate regression. In stratified analyses, hepatic steatosis remained independently associated with atherogenic dyslipidemia in non-obese individuals, those without metabolic syndrome, those with normal hs-CRP, non-alcohol abusers, and those with normal liver enzymes.

Conclusion: Hepatic steatosis was significantly associated with atherogenic dyslipidemia independent of obesity, components of the metabolic syndrome, medication use, and systemic inflammation after adjustments for traditional and non-traditional cardiovascular risk factors. These results suggest an independent relationship between hepatic steatosis, atherogenic lipid characteristics, and cardiovascular risk that needs further mechanistic study.