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Serum carboxymethyllysine (CML) and its relationship with markers of oxidative stress and insulin resistance in newly diagnosed diabetic patients with obesity and normal weight

Ma Eugenia Garay-Sevilla¹, Ma Etzabel Villegas Rodríguez¹ and Jaime Uribarri²

¹University of Guanajuato, Mexico

²The Icahn School of Medicine at Mount Sinai, USA

Introduction: Elevated levels of circulating advanced glycation end products (AGEs) as CML are believed to play a major role in the pathogenesis of macrovascular and microvascular disease in diabetes mellitus. Endogenous formation of AGEs is increased in diabetes as the result of hyperglycemia and increased oxidative stress in this condition. Recently, however, it has been demonstrated that food-derived AGEs play a major role in maintaining a high body pool of AGEs in diabetes.

Purpose: Purpose of this study is to evaluate the serum CML and its relationship with dietary AGEs, markers of oxidative stress and insulin resistance in newly diagnosed diabetic patients with obesity and normal weight.

Methodology: The study was performed on 80 newly diagnosed diabetic patients with normal weight (n=40) and with obesity (n=40). Clinical and anthropometric evaluations were performed; a sample of fasting blood was obtained for measured glucose, lipid profile, HbA1c, insulin, serum carboxymethyllysine (CML) and 8-hydroxy 2'-deoxy-guanosine (8-OHdG). The HOMA-IR was calculated according to Matthews et al. Reminders of 24 hours was made to quantify the energy and nutrient consumption and AGE intake was calculated from a database previously published by Uribarri, et al.

Findings: The mean of age of total group was 48.5±7.3 years. The diabetic patients with obesity had higher levels of insulin (p<0.0001); HOMA-IR (<0.001); 8-OHdG (<0.00001); CML (<0.00001) and dietary AGEs. In the total group serum CML correlated positively with dietary AGEs (r=0.27; p<0.018); BMI (r=0.31; p<0.006); HbA1c (r=0.31; p<0.007); HOMA-IR (0.63; p<0.0001) and 8-OHdG (r=0.44; p<0.001).

Conclusion: We found significant and strong associations between CML with metabolic control, HOMA-IR and markers of oxidative stress to DNA (8-OHdG). These results support the importance of performing prevention for the development of complications of diabetes since diagnosis.

Biography

Ma Eugenia Garay-Sevilla has more than 20 years of experience in the study of diabetes mellitus and its complication mainly advanced glycation end products. She is a leader in Mexico in the study of these products. She also studies obesity and its comorbidities from early stages of life to adulthood.

marugaray_2000@yahoo.com