Acculturation and Biomarkers for Type 2 Diabetes in Latinos

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In their review, Pérez-Escamilla and Putnik address the complexity between different levels of acculturation and the influence on nutrition, obesity, and other lifestyle factors, which consequently modulate the prevalence of type 2 diabetes in Latinos (1). One would expect that several of the changes in dietary patterns associated with acculturation may explain the prevalence of diabetes among subgroups of Latinos living in the US. However, the need for further research in this area is illustrated by the fact that there is no consistent evidence that acculturation is associated with a higher incidence of type 2 diabetes. Indeed, research shows that, although individuals who have been able to incorporate into the mainstream European-American culture appear to have less prevalence of type 2 diabetes, those who are less acculturated have more pronounced patterns of insulin resistance and dysregulation of glucose metabolism (2). However, this finding is likely to be confounded by poverty. In a survey conducted in Mexican Americans living in Arizona, 68% of those individuals presenting type 2 diabetes belonged to a lower socioeconomic group (3), indicating that poverty level is a major contribution to degenerative diseases. Although lifestyle changes may be responsible for these patterns, an assessment of biomarkers is needed to understand the progress of the disease.

Biomarkers as a means to understanding the influence of acculturation on health

Most of the studies evaluating the role of acculturation in lifestyle factors have been conducted by research groups that do not measure biomarkers. Although the findings derived from these studies have important public health implications, it is imperative that the new studies address the lack of information regarding metabolic aspects of the disease, in relation to diverse populations. For example, it is well known that dyslipidemias involving increased plasma triglycerides, lower HDL cholesterol concentrations, and the predominance of small LDL particles are typical of subjects diagnosed with type 2 diabetes (4). Inflammation markers such as C reactive protein and TNF-α have also been associated with type 2 diabetes (5).

It has also been well documented that, in addition to lifestyle factors, diabetes has a genetic component. Studies conducted in Mexico have shown the prevalence of high triglycerides, low HDL, and LDL phenotype B among children (6) and young adults (7), all of which are markers of the metabolic syndrome, the precursor of type 2 diabetes. In addition, studies conducted in the US in different Hispanic populations indicate that, independent of acculturation, Latinos are at high risk for cardiovascular disease and diabetes (1). This high risk may be the result of gene-environment interactions involving dietary patterns, lack of physical activity, and obesity, all of which are prevalent among Latinos.

Currently, very limited data exist regarding the presence of biomarkers for chronic disease and the role of acculturation among Latinos. Sundquist and Wikenbly (8,9) examined cardiovascular risk factors and waist circumference (WC) in a population of Mexican Americans, relative to the country of birth and their degree of acculturation. Those men and women who had been born in Mexico had the lowest WC (90.4 cm for women and 94 cm for men) and the lowest risk for cardiovascular disease, as assessed by blood pressure, LDL cholesterol, cigarette smoking, and BMI. Those Hispanics who spoke English (highest degree of acculturation) had an intermediate value for WC (93.6 cm for women and 97.3 cm for men) and for cardiovascular disease factors, whereas those who spoke Spanish had the highest WC (96.9 cm for women and 97.7 cm for men) and the highest risk for heart disease. These studies indicate major differences in risk factors for chronic disease, related to country of origin and degree of acculturation (8,9). To fully understand these results, it would be important to analyze in detail the relation between poverty in the less acculturated group and biomarkers indicative of chronic disease risk. Although it is understood that other factors, including level of stress and depression, are a major part of the etiology of diabetes among Latinos (10), public health policies should be aimed at educating these socially disadvantaged groups on lifestyle modifications that would alleviate the symptoms of the disease.

Future studies should focus on specific interventions, where dietary modifications and increased physical activity should be prioritized to modify the biomarkers of type 2 diabetes across all acculturation groups. The first aim of these interventions should be focused on weight loss, because reductions in WC and body mass are the key factors to improving insulin resistance and all biomarkers associated with type 2 diabetes. In addition, research has shown that polymorphisms in diverse genes provide valuable information regarding weight loss or weight maintenance in
response to various dietary therapies (11,12). In these genetic studies, individuals are separated on the basis of allelic variations in a candidate gene and differences in the amount of weight loss are evaluated based on polymorphisms. There is no information regarding specific genotypes and responses to diet among Latinos.

From the existing data regarding acculturation and biomarkers of type 2 diabetes, one can conclude that there are multiple factors that contribute to the prevalence of this disease in the Latino population, with the lowest-income, less acculturated Latinos having the highest risk for diabetes. It is clear that a combination of genes and lifestyle factors (with obesity being the key factor) add to the metabolic abnormalities, which will evolve into type 2 diabetes. Dietary strategies aimed at weight loss and genetic information on candidate genes, which might explain variations in weight loss in Latinos, are needed to have a better understanding of the influence of acculturation on type 2 diabetes in this ethnic group.

Literature Cited