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Diabetes in Older Hispanic/Latino Americans: Understanding Who Is at Greatest Risk

Older Hispanics are at greater risk for type 2 diabetes than non-Hispanic whites. This disease poses a greater burden for this cohort, and more research and interventions are needed to lessen this disparity.

The epidemic of type 2 diabetes is a major health and social problem, affecting more than 29 million people in the United States (Centers for Disease Control and Prevention [CDC], 2014). Type 2 diabetes is defined by the American Diabetes Association (ADA) as a condition characterized by hyperglycemia resulting from the body's inability to use blood glucose for energy. In type 2 diabetes, the pancreas is no longer able to provide enough insulin and also the body is unable to use it correctly (ADA, 2013).

Type 2 diabetes develops through a combination of genetic risk factors (family history), non-modifiable risk factors (such as age, race, or ethnicity), and modifiable risk factors (such as obesity and smoking). With age, the disease process becomes more complicated, as there are changes in body composition (gaining body fat, losing muscle), metabolism (less calories burned), and function (less physically active). Furthermore, type 2 diabetes in older adults can be long-standing (diagnosed before age 65) or new onset (at any age), resulting in an increased prevalence in this age group, and while it can be reversed or controlled, there is no cure for it.

The Office of Minority Health in the Department of Health and Human Services (HHS) offers epidemiological data on diabetes in Hispanics, based on national examination surveys (HHS, 2014). The report describes Hispanics as almost twice as likely to be diagnosed with diabetes when compared with non-Hispanic whites. Older Hispanics with diabetes are a vulnerable sub-population of interest because of their increased susceptibility to chronic diseases like obesity, diabetes, and hypertension (American Heart Association [AHA], 2014), health disparities, and challenges for management. Moreover, with Hispanics being the second largest ethnic minority in the United States (at 53 million, or 17 percent) and one of the fastest growing (U.S. Census Bureau, 2013), the study of diabetes in this population is crucial.

Are Disparities in Diabetes Risk Dependent Upon Place of Birth?

The ADA reports the rates of diagnosed diabetes by race or ethnic background. While only 7.6 percent of non-Hispanic whites and 9 percent of Asian Americans have diabetes, 12.8 percent of Hispanics have diabetes. Other high-risk ethnic

groups are non-Hispanic blacks (13.2 percent) and American Indians/Alaskan Natives (15.9 percent). There are further differences among Hispanic adults. For Hispanics living in the United States, the prevalence for type 2 diabetes is lower in those coming from Central and South America (8.5 percent) or Cuba (9.3 percent), but higher for those who are Mexican American (13.9 percent) and Puerto Rican (14.8 percent), who comprise the majority of Hispanic immigrants in the United States.

Diabetes prevalence in Latin American countries also has been studied. A landmark survey of a representative sample (10,587 subjects) of Hispanic/Latinos living in seven Latin American countries, found that self-reported diabetes varied markedly among the older adult population (Barceló et al., 2006). Mexico D.F. (Mexico) and Bridgetown (Barbados) presented the highest prevalence of diabetes (22.3 percent and 18.6 percent, respectively), while Havana (Cuba) and Santiago (Chile) showed the lowest (7.3 percent and 11.9 percent, respectively). These differences, and the very high prevalence described in certain cities, are quite striking. Why do these differences exist and how can they be explained?

As mentioned above, type 2 diabetes develops through a combination of genetic risk background, weight history through life, and non-modifiable and modifiable risk factors. Therefore, older Hispanics are at higher risk just by being older and Hispanic. Studies have found the diabetes prevalence is higher in areas where the majority of people are black (e.g., in Barbados) than it is in those with a predominantly white Caucasian (e.g., in Santiago or Montevideo, Uruguay) or mixed population (e.g., in Havana or Sao Paulo, Brazil). However, other factors like nutritional status, access to health-care services, and survival or mortality patterns vary within different Latin American countries.

An analysis of data from the *Salud Bienestar y Envejecimiento* (SABE, or Health, Wellbeing and Aging; www.ssc.wisc.edu/sabe/home.html)

project and the 1999–2004 NHANES (National Health and Nutritional Examination Survey) (Barceló et al., 2007) was conducted to examine the prevalence of obesity and diagnosed diabetes among older adults in the Americas. Diabetes was more frequent among elders of African or Mexican descent in the United States and in Latin American countries, when compared to populations that were of predominantly Western European descent. The Hispanic sub-population has a wide variety of genetic ancestry, and the prevalence of diabetes varies, consistent with the findings described above. In the United States, diabetes is more prevalent in non-Hispanic blacks.

Acculturation's Role in the Development of Type 2 Diabetes in Older Hispanics

Weight, physical activity, and smoking are modifiable risk factors of significant interest in preventing type 2 diabetes, even in older adults. A better understanding of what motivates people to adopt negative behaviors could help to develop or tailor interventions. Conversely, certain behaviors and attitudes are based on cultural or ethnic background. To address how migration and culture affect older Hispanics moving to or living in the United States, we need to address the process of acculturation among Hispanic immigrants and Hispanic Americans. Migration to the United States is ongoing and complex, but for the sake of this analysis, we will address older Hispanics who have aged in the United States.

Consider the case of Mr. S. G., a 70-year-old Hispanic gentleman who came to the United States twelve years ago. He likes the food his wife makes (the same type he used to eat in his country of origin), but he also likes fast food restaurants and all-you-can-eat buffets. He drives a car rather than use public transportation, which he used to do in his native country. He joined a gym for older adults, following the advice of his neighbors, but stopped shortly after joining because of pain. He progressively gained

weight in the past decade, but did not seek medical evaluation. However, at age 65 he applied for Medicare and began to see a doctor. He was diagnosed with diabetes.

Acculturation, adaption, or assimilation may occur at a personal level, with variability of its extent, even within the same social group. For example, members of a Hispanic family migrating to the United States may present different acculturation toward the behavior and lifestyle promoted in this country. A fourfold model proposes two dimensions that include maintenance of the original culture, or development of relationships with the new culture; and the four strategies of integration (maintaining attitudes and behaviors from the culture of origin and also adopting attitudes and behaviors of the new culture), assimilation (totally adopting the attitudes and behaviors of the new culture), separation (totally rejecting the new culture and maintaining the culture of origin), and marginalization (not identifying with either culture) (Berry, 1997). A highly acculturated individual may combine the second dimension with either the first or second strategy, and assimilate behaviors that may increase the risk for type 2 diabetes. Interestingly, such behaviors may have a greater impact in Hispanics than in non-Hispanics, and might account for why the prevalence of diabetes may be higher in the Hispanic population living in the same country.

Will older Hispanics continue their cultural (dietary) habits when moving to another location (the United States), assimilate local dietary habits, or mix the two? This is an important question, because it has been found that people of any ethnicity who move to the United States gain weight, and obesity is highly prevalent among Hispanics in this country (Ogden et al., 2014). In this report, the prevalence of overweight and obese older people is higher in Hispanics than in non-Hispanic whites.

An older study indicated that older Hispanics consumed significantly less saturated fat and simple sugars, and more complex carbohydrates than non-Hispanic whites, but when living for a longer time in the United States, there was a shift toward the macronutrient profiles seen in non-Hispanic whites (Bermúdez, Falcón, and Tucker, 2000). A more recent critical review indicated that by socioeconomic status, age, and movement from urban to rural areas confounded the differences between acculturation and health-related outcomes (Pérez-Escamilla and Putnik, 2007). While there were incongruent findings regarding the intake of fruits and vegetables and dietary fat; an increased intake of sugar was the most consistent finding. In general, Hispanics are more likely to include more starchy food in their diet than their non-Hispanic white counterparts. The increased consumption of rice and meals with high carbohydrate content is associated with larger waist circumferences, higher BMI, and an increased risk for developing diabetes.

Weight, physical activity, and smoking are modifiable risk factors, and are significant in preventing type 2 diabetes, even in older adults.

Physical activity also can be affected by acculturation. Overall, Hispanic women perform fewer moderate and vigorous exercise activities than their white counterparts. Interestingly, this could be balanced by an increased amount of housework, yard work, and other non-leisure physical activities, which can equal moderate or vigorous activity levels (Pérez-Escamilla and Putnik, 2007). Interestingly, highly acculturated individuals may incorporate more time for exercise in their lifestyle, with a positive impact in their risk profile. In the end, these differences in acculturation reduced or eliminated the ethnic difference in total activity level.

Of note, the consistency and validity of tools used to evaluate acculturation in older Hispanics

need to be considered, as they play a role in the utility of the results. A recent systematic review addressed the usefulness of instruments to measure acculturation and cultural factors on the lifestyle and behaviors of ethnic minorities (Thomson and Hoffman-Goetz, 2009). The investigators found close to 2,000 publications, from which they included 134 studies, albeit with considerable variation in the definition and measurement of acculturation. Several studies use proxy indicators (e.g., immigration status, length of residence, and language), which may not directly measure such elements of acculturative change as attitudes or behaviors. Measuring these elements may require a more complex approach.

Differences in acculturation reduced or eliminated the ethnic difference in total activity level, as highly acculturated individuals exercised more.

In the HCHS/SOL (Hispanic Community Health Study/Study of Latinos) study, a multicenter cohort study of 15,079 U.S. Hispanic/Latino participants with Cuban, Dominican, Mexican, Puerto Rican, Central American, and South American backgrounds (Davignus et al., 2012), less acculturated subjects (defined as foreign-born or first-generation immigrants who had lived in the United States for fewer than ten years, or for whom Spanish was the preferred language) had a lower prevalence of stroke and risk factors for type 2 diabetes and cardiovascular disease. The researchers proposed that cardiovascular disease risk status may increase over time with the process of acculturation of Hispanic/Latino population into the American lifestyle.

The impact of acculturation deserves more attention, with prospective studies designed to address socioeconomic covariates in older Hispanics, under the premise that adopting negative lifestyle habits may contribute to developing diabetes. A recent report focused on older Mexican Americans found no evidence that preservation of immigrant culture was protective

against diabetes (Afafe-Munsuz et al., 2013). Its definition for preserved culture was based on the subjects' preference for using the Spanish language. The study observed a tendency toward increased diabetes risk from the first to third generation, which was statistically significant only for those with low socioeconomic status.

Do Cardiovascular Risk Profiles Differ in Older Hispanics?

We know type 2 diabetes is highly prevalent in older Hispanics, so now we need to address its implications. A study of 8,693 foreign- and U.S.-born Mexican American and non-Hispanic whites from the 2003–2008 U.S. NHANES addressed the incidence of low cardiovascular disease risk, defined as follows: not currently smoking, no diabetes, normal cholesterol, normal blood pressure, and Body Mass Index (BMI) of less than 25 kg/m² (Kershaw et al., 2012). After adjusting for socioeconomic, lifestyle, and acculturation-related factors, foreign-born Mexican Americans were more likely to be at low risk for cardiovascular disease than non-Hispanic whites, but U.S.-born Mexican Americans were less likely to be at low risk compared to non-Hispanic whites. Because these differences were attenuated after adjusting for acculturation, the researchers concluded that acculturation-related factors may drive ethnic and nativity-related differences in low cardiovascular disease risk.

Differences in cardiovascular disease and diabetes risk factors among Hispanic subgroups and gender were measured in the HCHS/SOL (Davignus et al., 2012). There was a marked variation in the results, where Puerto Rican women had the highest prevalence of each of the major cardiovascular disease risk factors, and Mexican men and women had high rates of diabetes. Men and older Hispanics presented greater cardiovascular disease risk factors, when compared with women and younger people. The increased

risk status was also attributed to lower education and income. More recently, a study of 6,547 Hispanic men and 9,797 Hispanic women found high BMI values and cardiovascular disease risk factors (Kaplan et al., 2014). The presence of morbid obesity (BMI greater than 40 kg/m²) was associated with a tendency for men to have greater cardiovascular disease risk than women.

In summary, older Hispanics are at high risk for cardiovascular disease, worsened by the high prevalence of diabetes, which is in itself a risk factor.

Differences in Diabetes Control, Complications, and Mortality

Diabetes control, complications, and mortality vary across populations, as outlined in the following sections.

Diabetes control

Results from the 1999–2000 NHANES indicated that more than 60 percent of Hispanics with type 2 diabetes had uncontrolled values of Hemoglobin A1c (HbA1c) (Boltri et al., 2005). Of note, the definition of “uncontrolled” was based on a fixed HbA1c number (higher than 7 percent), and this is not consistent with our current understanding of glucose targets, especially in older adults, where a patient-centered and individualized approach incorporates the understanding of functional and cognitive status, social support, and other factors. The HbA1c target could be as high as 8.5 percent for an older adult with multiple comorbidities and impaired mobility, for example, depending upon the case. A more recent review indicates that Hispanics with type 2 diabetes have higher HbA1c levels and greater rates of obesity and metabolic syndrome (Gonzalez, Salas, and Umpierrez, 2011)—all of which are associated with poorer glucose control.

Complications

There are reports of an increased risk for cerebrovascular disease in Hispanics with type 2 diabetes. A study on lacunar strokes found an

increased prevalence of intracranial atherosclerosis, poor prognosis and greater incidence of recurrent stroke and death in this group (Palacio et al., 2014). We did not find disparities regarding coronary artery disease or peripheral vascular disease.

African Americans, Hispanics, and Asians may have important differences in diabetes-related foot complications (McEwen et al., 2013). Contrarily, we did not find evidence to support greater prevalence of diabetic retinopathy or disparities in the development of early diabetic nephropathy, but Hispanics have higher rates of end-stage renal disease (CDC, 2014).

Mortality

Hispanics are 50 percent more likely to die from diabetes than non-Hispanic whites (CDC, 2014). Nonetheless, a “Hispanic paradox” has been proposed, suggesting that Hispanics in the United States have similar mortality rates to those of European Americans, despite the presence of worse disease profiles and lower socioeconomic status. Some argue that this paradox is not valid, and that older Hispanics remain at risk for poor outcomes and mortality.

It was considered that across ethnic groups, diabetes may not be properly documented in death certificates, leading to lower documentation of mortality rates due to diabetes itself. To understand if this issue could, in part, explain the Hispanic paradox, researchers reviewed data from 1979 to 1998, with data covering 2.3 million records from the National Longitudinal Mortality Study (Arias et al., 2010). This study found only modest errors that did not significantly affect mortality rates, suggesting that lower mortality rates in Hispanics may not be due to an artifact of poor data quality.

On the other hand, a more recent, smaller but longitudinal study, the San Antonio Longitudinal Study of Aging, compared the predictors of mortality between older Mexican Americans and older European Americans (Espinoza, Jung, and Hazuda, 2013). Diabetes and frailty were found to

be more prevalent in Mexican Americans, who were at greater risk of mortality than European Americans. Differences in socioeconomic status largely explained this ethnic disparity, and the most significant independent predictors of mortality, regardless of ethnic group, were type 2 diabetes with complications, comorbidity, depressive symptoms, and cognitive impairment. A larger, prospective population-based study would be required to fully clarify the Hispanic paradox. However, it is clear that diabetes and its complications in older Hispanics impose an increased risk for morbidity, disability, and mortality, requiring public health attention to prevention and management.

Lifestyle Challenges for Older Hispanics at Risk for Type 2 Diabetes

The following sections outline how health insurance coverage, quality of life, and disability can impact the outcomes from type 2 diabetes in older Hispanics.

Health insurance coverage

The lack of health insurance coverage has been associated with higher rates of microvascular complications among Hispanics with type 2 diabetes. Limited access to healthcare and medical insurance can lead to fewer preventive

them had zero to one healthcare visits per year). This apparent advantage in favor of older Hispanics with type 2 diabetes could be exploited toward better care and outcomes in this age group.

Quality of life

A recent study addressed the health-related quality of life in 3,047 adults who self-reported diabetes in the 2001–2010 NHANES (Zhang et al., 2014). Hispanics without insurance coverage or with longer diabetes duration showed worse quality of life. Hispanics who were divorced, widowed, or separated had poorer physical and mental health. In our practice we have seen that isolation, language barriers, and low socioeconomic status worsen these issues and suggest that arranging healthcare resources to increase insurance coverage for minorities could be a powerful tool to further reduce these disparities.

Functional outcomes

A study of 3,050 older Mexican Americans addressed the longitudinal rates of change in disability and physical function (Palmer et al., 2012). Twenty-three percent of participants had self-reported diabetes, which was associated with greater decline in function and disability over time. Another study on 3,298 stroke-free adults, of whom 52 percent were Hispanic, and 22 percent had diabetes (Dhamoon et al., 2014), found a 1 percent mean decline in function per year, even in the absence of clinical vascular events. Lifestyle interventions remain mainstay therapy, and interventions delivered through peer leaders can be effective to improve functional parameters, as we found in a population of older veterans, including older Hispanics (Florez et al., 2013). More longitudinal studies are needed to ascertain the best interventions to prevent disability in older Hispanics with diabetes.

Health insurance coverage, quality of life, and disability can impact the outcomes from type 2 diabetes in older Hispanics.

interventions, limiting the screening for complications. A recent study from the 1999–2010 NHANES addressed the concurrent control of glucose, blood pressure, and cholesterol among older adults with self-reported diabetes (Egan et al., 2014). Remarkably, older Hispanics achieved better control than younger Hispanics. When addressing the potential explanations, researchers found lesser access to healthcare in the latter (41.2 percent lacked insurance and 32 percent of

Conclusion

The presence of diabetes in older Hispanics is more frequent than in non-Hispanic whites.

Acculturation may impact Hispanics who assimilate unhealthy behaviors, but their ethnic background by itself may increase the risk to have the disease, experience poorer control, or develop complications. These will be associated with a greater burden for the older Hispanic individual, as diabetes affects all geriatric domains (medical, functional, social, and psychological), and may lead to disability and death.

Language barriers and other limitations may affect older Hispanics in the current healthcare system. However, contrary to what most people would imagine, older Hispanics have greater access to health insurance than do their younger counterparts, together with better diabetes control. Nevertheless, additional threats include social barriers with their treating providers (differences in age, ethnicity, socioeconomic status), limitations in communication (language, literacy, and numeracy), and their own perception, adherence, and understanding of their treatment. Further studies are required to properly understand how to overcome barriers and deliver culturally sensitive interventions for older Hispanics with diabetes. 

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