Substantial portions of the US population are now defined as ethnic subgroups. With this growing diversity comes an urgent need to understand the biologic, cultural, and social elements determining ethnic differences in health and thus design cost-effective and cost-beneficial health interventions.
The largest and fastest-growing minority population in the United States is the Hispanic population. The term Hispanic is typically defined as individuals born to families with cultural connections to Spain or to areas colonized by Spain and whose first language is Spanish. Hispanics account for more than 15% of the US population, and projections indicate that by 2050, Hispanics will make up close to 30% of the US population.

The Hispanic ethnic group is heterogeneous, with great diversity in terms of race, geography, and socioeconomic and cultural determinants. This diversity has proven significant enough to trigger the investigation of independent risk factors for health. A study published in 2009 demonstrated statistically significant differences in diabetes mellitus risk factors among various Hispanic subgroups, highlighting the need to evaluate these subgroups carefully when analyzing health behaviors and outcomes research and when designing studies of this population. Further, it is interesting to observe that Hispanic groups living in the United States are likely to have a higher prevalence of diabetes mellitus than do groups in Hispanics’ countries of origin.

The present review examines diabetes in first-generation Hispanic Americans, who are defined as individuals born in the United States to Hispanic families. This population is younger and more reproductively prolific than the non-Hispanic US population. The US Census Bureau estimates that nearly half of all children younger than 5 years of age belong to ethnic minority groups, and that 25% of these children are born to Hispanic families.

Children born to Hispanic families have roughly double the risk of obesity compared with non-Hispanic white children. Obesity greatly predisposes individuals to the development of diabetes, as well as cardiovascular disease, cancer, renal failure, and metabolic syndrome. Because of obesity, an alarming number of young first-generation Hispanic Americans have the potential to develop diabetes mellitus early in their lives.

The need for access to quality health care and the complications related to financing care for first-generation Hispanic Americans with diabetes pose a growing and monumental challenge to the US health care system. The impact on public health if this trend is ignored would likely involve increases in the morbidity and mortality of first-generation Hispanic Americans.

**Biologic determinants**

Genetic makeup constitutes an important risk factor for the development of several chronic conditions, including diabetes mellitus. Racial and ethnic variations in the incidence and prevalence of diabetes are likely explained by relationships among genetic makeup, environmental influences, and social and cultural determinants.

Family studies—particularly those using technologies developed as a result of completion of the Human Genome Project, such as linkage analysis, expression analysis of loci, and genome-wide association studies—may help identify genetic predisposition to diabetes in specific populations. In the case of type 1 diabetes mellitus (T1DM), evidence reveals that this disease is associated with highly polymorphic human leukocyte antigen (HLA) class II genes, which account for approximately 40% of familial clustering in T1DM.

The loci known to be involved in T1DM are HLA-DR3 and HLA-DR4, which are located on chromosome 6p. More than 90% of patients with T1DM carry either the HLA DR-DQ2 allele or the HLA DR4-DQ8 allele. Alleles closely linked to the HLA-DR3 and HLA-DR4 loci are hypothesized to somehow alter the individual’s immune response to an environmental antigen (eg, a common viral infection), with the unintended consequence of complete destruction of the pancreatic beta cells.

Type 2 diabetes mellitus (T2DM) accounts for more than 90% of all cases of diabetes and poses a great threat to first-generation Hispanic Americans for the reasons previously stated. The association between T2DM and Hispanic Americans has a strong genetic component, with the concordance rate in monzygotic twins being close to 90%. The recurrence risk for first-degree relatives is high (ie, 15% to 40%). Hispanic populations that have adopted a typical “American diet” (eg, high in fat and sugar, low in fiber) and a more sedentary lifestyle show increased incidence of T2DM, most likely as a result of obesity.

Hispanic Americans have been found to be more insulin resistant than non-Hispanic white Americans, even after adjusting for body fat. In addition, Hispanic Americans are more likely to have abdominal obesity, a major risk factor for T2DM.

A number of genes have been linked to T2DM, though the genetic component of this disorder is not completely understood. Genetic mapping has identified more than 20 loci contributing to risk of T2DM. The next step is to identify the genes and mechanisms regulating the
contributions of genetic risk to the disease. A recent study has advanced our understanding of the complex genetic determinants in T2DM by providing evidence that tissue type is a strong contributing variable to differential gene expression.9 That study also suggested that age, height, weight, and single nucleotide polymorphisms in or near candidate genes are not associated with increased risk of T2DM.9 Further research is needed to elucidate the complexity of genetic mechanisms as biologic determinants in diabetes.

Social determinants
An important aspect of studying the incidence and prevalence of diabetes mellitus is the analysis of social determinants. A few studies have included income as a relevant variable when considering social determinants, but many studies lack adequate conceptualization of the role that social determinants of health play in diabetes. As the literature examining dimensions of health care inequality among different populations expands, sharper focus is being placed on income, housing, and food insecurity resulting from the current economic recession.10

We know that members of ethnic minority groups are disproportionately affected during times of national and global economic hardship. The impact of social determinants of health in first-generation Hispanic Americans exponentially increases the susceptibility of this group to risk factors influencing disease processes. Evidence of increasing income inequality among Americans and increasing numbers of low-income families during an economic downturn has directed special attention to potential effects of low income on the health and well-being of individuals with diabetes.10

An understanding of the influence of social determinants on health is reflected in the work of Brunner and Marmot.11 On the basis of their model, it is clear that societal determinants of health could influence the morbidity and mortality of patients with diabetes through two possible mechanisms.11 In one mechanism, social determinants are an influence on the incidence and prevalence of the disease process. In the other mechanism, social determinants influence the management of the disease process.

The model described by Brunner and Marmot reveals that societal determinants of health influence the adoption of behaviors that contribute to the incidence and successful management of diabetes.11 Furthermore, the model indicates that aspects of material deprivation may directly influence the incidence and management of the disease process via a myriad of biologic, psychological, and social mechanisms.

Income influences various aspects of an individual’s life, including quality of early life (via such factors as child care, playground access, and physical activity); levels of stress (induced by unemployment, underemployment, racism, and insecure housing); degree of social exclusion; and availability and quality of food. Good nutrition is considered the cornerstone of proper management of diabetes, but the inability to meet food needs is a persistent problem for families living in or near poverty.

Measuring the health of a household by assessing material deprivation, psychosocial stress, and adoption of health-threatening behaviors may serve as a relatively accurate predictor of social determinants of health for each household member.2 First-generation Hispanic Americans are at great risk of experiencing adverse social determinants of health, particularly because many are born into low-income families.

An urgent need exists for further advancements in new models of interventions, research, and funding mechanisms to tackle diabetes in first-generation Hispanic Americans. Physicians caring for individuals in this population should always consider the social determinants of health as essential factors in the incidence and prevalence of diabetes.

Cultural determinants
Although Hispanic Americans generally share certain core cultural values, Hispanic subgroups have differences in history, traditions, and cultural beliefs, depending on the country or region of origin. Furthermore, according to the amount of time spent living in the United States and the makeup of the communities in which they reside, Hispanic Americans may have different grades of acculturation and education—factors that may influence the extent to which they hold traditional values and beliefs.

Many other cultural factors influence treatment of Hispanic Americans with diabetes. Among these are the following:

■ Language barriers
Hispanic Americans who do not speak English are less likely than English-speaking Hispanic Americans to adhere to a medication regimen and are less likely to be satisfied with the care they receive, thereby negatively impacting their health outcomes.12

■ Beliefs regarding weight
For some Hispanic American subgroups, being overweight is considered an indication of health and wellness,13 and being thin may be considered worrisome and a sign of disease. Therefore, recommendations for a patient to lose weight may be ignored or not be taken seriously. In addition, words such as “fat” do not carry the same negative connotation in Hispanic cultures that they do in English-speaking cultures. In fact, gordo (Spanish for “fat”) is often used to refer to a friend who is overweight without being considered insulting.

■ Acculturation and changes in diet
As Hispanics become acculturated in the United States, they adopt the “American diet,” which, as previously mentioned, is high in fat and sugar and low in fiber. This diet, combined with a sedentary lifestyle, promotes high rates of obesity and increases the risk for diabetes mellitus.7
Integration of traditional and folkloric beliefs

Many Hispanic Americans associate susto with diabetes. Susto, a culture-bound syndrome with strong psychological overtones, is defined by many Hispanics as a “fright sickness” and literally a loss of the soul from the body. For other Hispanics, susto is a state of anxiety or stress caused by an upsetting event in their lives, such as relationship troubles, financial difficulties, or witnessing of a tragedy.

American physicians frequently ignore susto. However, some Hispanic patients diagnosed as having diabetes believe that susto is the cause of this condition, even when the diabetes is diagnosed several years after the upsetting event it is associated with.14,15

Negative attitudes toward medications

A common belief among some Hispanic Americans is that insulin causes blindness. Thus, such patients may be reluctant to start treatment or to be compliant when insulin is added to their regimens. In addition, many Hispanic patients may choose to take diabetes medications only on days when they feel symptoms related to high blood sugar levels or when they eat particularly unhealthful foods.13,16

Herbal remedies

For some Hispanic Americans, the use of herbal remedies is important in the management of diabetes. Such individuals may consider herbal products to be more natural and, hence, less likely to produce adverse effects in the body. However, many patients may not disclose the use of herbal products for fear of disapproval from their health care providers.

Religious beliefs, fatalism, and stigma

Many Hispanic American groups believe that their health is in God’s hands, a belief that may cause them to not use preventive measures or to delay seeking care for diabetes. Having someone in the family with diabetes may reinforce the idea among Hispanic patients that they are predestined to suffer from the disease and that there is nothing they can do to prevent it. Therefore, strategies to “scare” these patients with warnings of such possible complications as amputations and kidney problems may not be effective.13

Lack of access to health care

Hispanic Americans are less likely to have health insurance and more likely to work in low-paying jobs, compared to non-Hispanic white Americans. Low incomes may contribute to difficulty in accessing reliable transportation to physicians’ offices, purchasing medications, getting time off for physician visits, and even finding safe places in which to exercise.20

Future challenges and opportunities

Although wide variation exists among Hispanic groups in cultural values and beliefs, food preferences, acculturation, and education, a number of important strategies can be adopted to benefit the diagnosis and treatment of diabetes among Hispanic Americans, with diabetes. Examples of these strategies follow below:

Use of culturally oriented diabetes-prevention campaigns, consisting of such elements as:

—radio messages on Spanish-language radio stations.

—recipes featuring healthier twists on traditional Hispanic recipes.

—educational materials, at appropriate cultural and literacy levels, developed with input from the community.

—local community leaders trained to deliver diabetes-prevention messages.

Train health care providers in cultural competence, including not stereotyping patients. Cultural competence involves such components as knowledge of cultural differences, ability to perform...
a cultural assessment, effective communication skills, and awareness of cultural desire (ie, a patient’s internal motivation).12,25

Ensure cultural diversity in medical colleges by promoting “pipeline” programs to attract more Hispanic American medical students.26

Improve health care access by involving local community agencies and clinics in outreach health activities.24

Address social determinants for diabetes26,27 with such efforts as:
—funding local vegetable gardens.
—organizing local sporting events to promote exercise.
—promoting activities to reduce stress.
—involving local businesses in improvement of local parks.

References


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