

## Euro Pharmaceutics 2019: Understanding diabetes beyond numbers: Complications and comorbidities- Nuzhat Chalisa- Clinical Endocrinologist, Morris Health System

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Diabetes is a growing global health concern that affects all age groups and genders. Analysts predict a worldwide prevalence of 552 million people with diabetes by 2030. Uncontrolled diabetes can lead to acute complications, including but not limited to, hypoglycemia, hyperglycemia, diabetic coma, diabetic ketoacidosis, and diabetic non-ketotic hyperosmolar coma.

Recurrent ongoing hyperglycemia can lead to chronic complications. These complications occur due to a mix of microangiopathy, macrovascular disease, and immune dysfunction. Microangiopathy can affect all vital organs, including the kidneys, heart, and brain, as well as eyes, nerves, lungs, and local gums and feet. Macrovascular problems can lead to cardiovascular disease, stroke, and peripheral vascular disease leading to gangrene and amputation. The damaging effects of hyperglycemia on the vasculature significantly contribute to diabetes complications and comorbidities. Between 30% and 50% of all diabetic patients have some organ damage, which can potentially progress to long-term complications. Hyperglycemia is toxic, whether it occurs early or later in life, and regardless of its etiology.

Comorbidities compound the chronic complications of diabetes. These include smoking, obesity, high blood pressure, and/or elevated cholesterol levels. Additionally, there are many other complications of diabetes which are not recognized and often remain unaddressed, such as diabetic dermopathy, osteoporosis, sleep apnea, musculoskeletal impairments, gastroparesis and dental problems, mental health issues, and vitamin deficiencies.

Type 2 diabetes has been disproportionately increasing in minority populations. Non-Caucasian populations such as Hispanics, African Americans, and Asians are much more likely to develop type 2 diabetes and less likely to have effective control. Certain ethnic populations have a higher risk of complications from diabetes than others.

In addition to the societal and humanistic effects, the management of diabetes and its complications has substantial economic impact. If diabetes is undetected or its complications are poorly managed, patients can experience a poor health-related quality of life with significant morbidity and mortality, so optimal prevention and treatment strategies are necessary.

Adequate and sustained control of blood sugar levels can prevent or delay the onset of diabetes-related complications. However, effective interventions, at both the individual and population levels, are desperately needed to slow the diabetes epidemic and reduce the burden of diabetes-related complications.

Based on CDC data from 2017, over 30 million Americans have been diagnosed with type 2 Diabetes and another 7 million are suffering from undiagnosed diabetes. Out of the 30 million, 15.1% are American Indian, 12.1% are African American, 12.7% are Hispanic and Native American, 8% are Asian American, and 7.4% are Caucasian.

Scientists have linked several gene mutations to a higher risk of diabetes. Not everyone who carries a mutation has diabetes. Individually the contribution from each gene mutation is very small. However, the risk significantly increases when combined with a host of environmental and cultural factors.

Cultural factors like eating habits, food choices, religious beliefs and lack of trust in the system has a big impact on development of diabetes so does medical and environmental factors like obesity, family history, hypertension, high triglycerides and history of gestational diabetes. The good thing is that many of these factors are modifiable.

Minority groups like African Americans, Asians, Native Americans, and Hispanics are more likely to develop type 2 diabetes and less likely to maintain effective control.

When compared to Non-Hispanic Whites African Americans have 77% higher risk of developing diabetes over all. They also have 3 times higher risk of developing CKD and ESRD. African Americans have 2.2 times higher risk of getting hospitalized for diabetes and 2-3 times higher risk of death from complications of diabetes.

In one study comparing increased incidence of DKA in African American population, cessation of insulin was a major precipitating factor. 40% stopped insulin due to lack of means to get refills for insulin and another 25% stopped due to fundamental misunderstanding of the role of insulin on sick days. Rest of the 33% did not have a specific reason. Nearly 2/3rd of the cases could have been prevented if they had resources to get insulin and better understanding of what it does.

The American Diabetes Association has taken a lead to increase its advocacy efforts by establishing various programs towards this goal. The Diabetes Action Council invited leadership from different communities including physicians, nurses, diabetes educators, and physician assistants from within the community. These leaders then take ADA preventive care and educational program to their respective communities.

The National Diabetes prevention program is partnership of several public and private organizations working together to prevent or delay type 2 diabetes.

The National diabetes education program was initiated in 1997 jointly by centers for disease control and National institute of health to promote early diagnosis and to improve treatment and outcome of people with type 2 diabetes. Initial program was focused on improving blood glucose based on DCCT data however they have recently launched a new program for optimal control of blood pressure and lipids.

The Dream Project is a five year community based research study on Asian American health being conducted at the NYU medical center. Goal is to implement a community health worker program designed to improve diabetes and diabetes related complications in south Asian community in New York city.

International Diabetes Federation is an umbrella organization of over 230 national diabetes associations in 170 countries headquartered in Brussels, Belgium. This organization leads global diabetes community with a common goal of raising awareness of diabetes, promoting prevention and appropriate care and encouraging activities towards the cure of diabetes.

Based on International Diabetes Federation by 2040, 640 million people will have diabetes worldwide. It is crucial to recognize the differences in genetic makeup cultural and environmental risk factors for diabetes in different ethnic populations.

Key element to overcome cultural barriers during patient to physician interaction is to use effective communication. We need educational material tailored for patients with low literacy and limited English proficiency to confirm patient understanding.

Another important factor is cultural perception of health. Diabetes education plays an important role in Diabetes self-management. Awareness of the need for cultural sensitivity is the first step towards providing sensitive and competent Diabetes education. Diabetes educators need to be mindful of cultural traditions and customs among different ethnic groups to recognize any socio economic challenges that may exist.

The large scope of Diabetes in minority population with diverse genetic and cultural backgrounds calls for more therapeutic trials involving minority populations and an investigation into the cause of increased susceptibility and preventive efforts at an individual and population level. Genetic and cultural diversity

Diabetes Complications, 2019 Volume 3 | Issue 1 | 3 of 3 © 2019 Nuzhat C. This article is distributed under the terms of the Creative Commons Attribution 4.0 International License should be considered when making guidelines. It is imperative that practitioners and policymakers address these ethnic disparities with a sense of urgency.