Managing type 2 diabetes in Black patients

Abstract: Despite many novel treatments available for managing type 2 diabetes mellitus, Black patients continue to disproportionately suffer complications associated with poor glycemic control. This article describes a comprehensive approach to managing diabetes mellitus in these patients while addressing cultural nuances that may be barriers to positive outcomes.

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The prevalence of diabetes mellitus has skyrocketed to pandemic proportions worldwide. These patients pose an array of challenges to healthcare providers, and it is often difficult to manage them successfully. The ability to control a patient's blood glucose and other health indicators, such as BP and lipid profile, is crucial to delaying or minimizing complications, including blindness, kidney failure, loss of limbs, stroke, and sometimes death. It is well known that Black patients are affected disproportionately by diabetes. This population is 1.8 times more likely to develop diabetes as compared to non-Hispanic Whites and suffers far more complications associated with poor glycemic control.[1,2] It is therefore imperative that healthcare providers develop the necessary skills to address the needs of Black patients with diabetes and to minimize negative outcomes.

Keywords: comprehensive diabetes care in Black patients, diabetes education, diabetes management, diabetes treatment in Black patients, type 2 diabetes mellitus in Black patients

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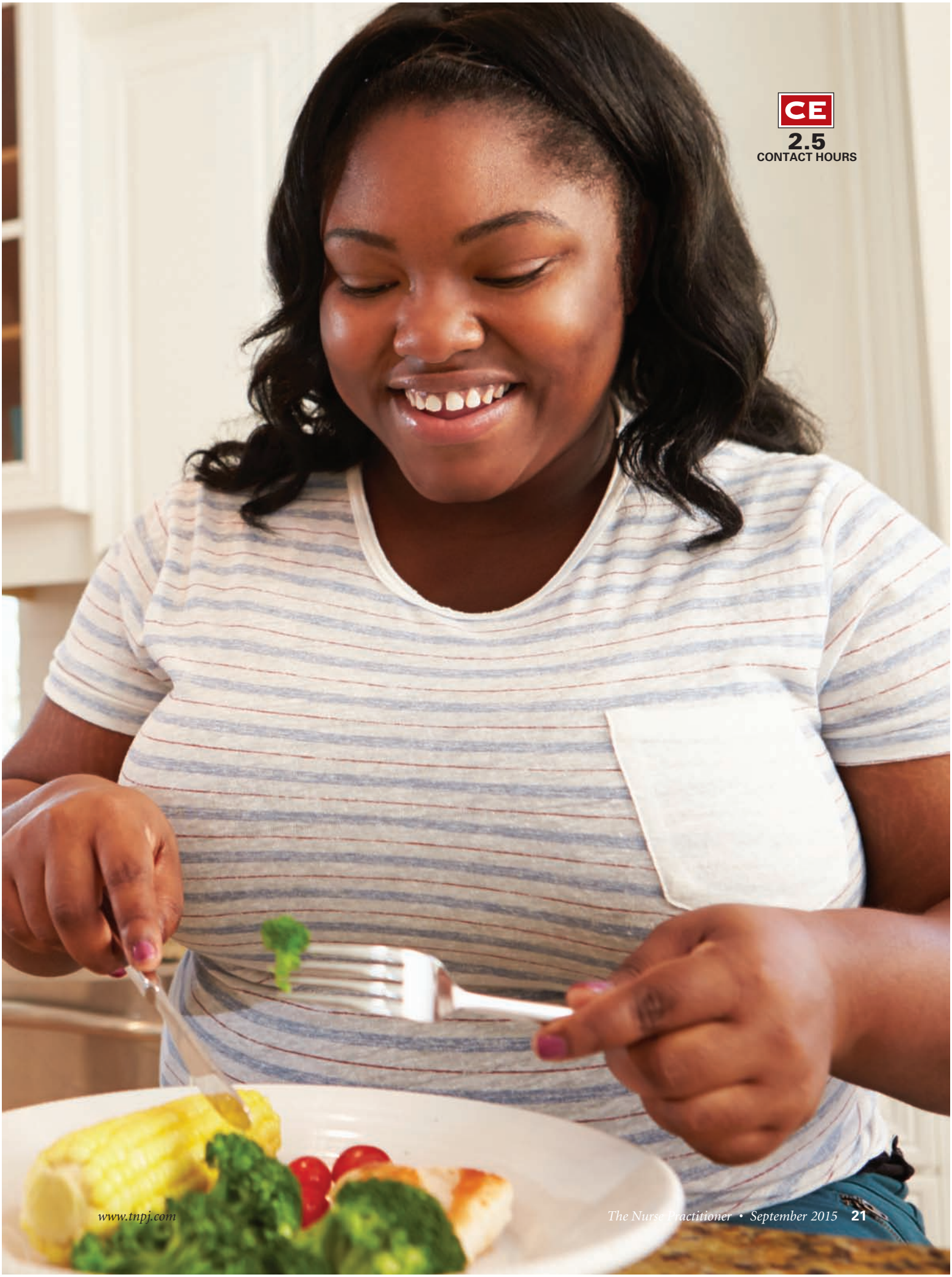

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Definition and etiology

Diabetes mellitus is a chronic disease requiring lifelong management to prevent or delay complications that can have devastating consequences if poorly controlled. Diabetes mellitus can be defined as a group of diseases marked by high levels of blood glucose resulting from inadequte insulin production, insulin action, or both, and can lead to serious complications and even premature death.[1,3,4]

According to the American Diabetes Association (ADA), diabetes is classified into four categories.[1,3] Type 1 diabetes mellitus usually results from beta-cell destruction, causing an absolute insulin deficiency and failure paired with a lifetime dependency on exogenous insulin. Type 2 diabetes mellitus is far more common, representing 90% to 95% of the individuals with diabetes, and is the result of a progressive insulin secretory defect and a buildup of insulin resistance.[3]

DSME is identified as a critical element of care for all patients with diabetes and necessary to improve patient outcomes.

When patients develop insulin resistance, the cells within the liver, muscles, and fat tissue cannot use insulin appropriately, thereby over-tasking the beta cells, which are then unable to make sufficient insulin over time. Another category of diabetes known as gestational diabetes mellitus occurs during pregnancy. This type of diabetes is diagnosed in pregnant women who have not been established as having diabetes prior to pregnancy. The recommendation is to establish presence of disease early during the first trimester in expecting mothers with risk factors that confirm if they have undiagnosed type 2 diabetes mellitus. Lastly, other less common types of diabetes include latent autoimmune diabetes in adults, maturity-onset diabetes of youth, and specific types of diabetes resulting from a genetic defect in insulin action, disease of the exocrine pancreas, or can be induced by drugs or chemicals.[1,3,4]

Prevalence of diabetes, its complications, and financial implications

The number of individuals diagnosed with diabetes mellitus continues to increase in the United States. The latest numbers from the CDC report that 29.1 million (or 9.3%) of the U.S. population has diabetes mellitus.[3] About 21.0 million are diagnosed with the disease, while another 8.1 (or 27.8%) have diabetes mellitus but are yet to be diagnosed.[3] Approximately 4.9 million (or 18.7%) of Black patients over age 20 have diagnosed and undiagnosed diabetes, with 13.2% already diagnosed with the disease, second only to American Indians and Alaskan Natives.[1,3,4] Black patients tend to suffer more from poor glycemic control, and the prevalence of avoidable complications often related to poor glycemic control in this population is astounding and often devastating. Black patients are 50% more likely to develop diabetic retinopathy leading to blindness, are 2.6 to 5.6 times more likely to have kidney disease, and are 2.7 times more likely to suffer lower-limb amputations.[1]

The estimated cost of diabetes mellitus continues to increase. According to the ADA report on estimated economic burden of diagnosed diabetes mellitus in the United States, as of 2012, the cost of managing and treating diabetes was estimated at $245 billion of which $176 billion went to direct costs and another $69 billion went to indirect costs, such as disability, work loss, and premature death.[3,5] Though there is no clear demarcation as to cost for caring for patients with type 1 diabetes mellitus as compared to patients with type 2 diabetes, 90% to 95% of patients have type 2 diabetes mellitus, as this is the far more common type of diabetes and contributes significantly to the cost of managing diagnosed diabetes.

Treatment plan

Treating diabetes mellitus in any patient requires a multifaceted approach. Providers should not depend on one single approach in order to be successful in managing diabetes. A multifaceted approach includes:

- Lifestyle and behavioral changes: Comprehensive care should include lifestyle and behavioral changes, such as increased physical activity, healthy eating, and weight control.
- Pharmacologic therapy: Oral pharmacologic therapy and/or insulin regimen may be required to achieve glycemic control. Drug therapy should be adjusted in a timely manner if the patient is not achieving his or her desired blood glucose target.
- Diabetes self-management education (DSME) training: DSME is identified as a critical element of care for all patients with diabetes and necessary to improve patient outcomes. There is evidence that DSME can equip adults with basic knowledge to manage their diabetes while focusing on self-identified problems and goals. An expected outcome of DSME is for the patient to develop appropriate diabetes management knowledge and skills and improving glycemic control that could potentially lead to a decrease in diabetes-related complications and premature death.

Discussing the importance and benefits of lifestyle changes with patients is very important, as this may help with glycemic control and improve health outcomes. This should be done with cultural humility, taking into consideration how the patient views him or herself within their cultural group. Cultural humility is when a provider checks the imbalances that exist within the dynamic of provider-patient communication and allows providers to find commonalities with their patients.[6] Addressing these types of issues will enable the provider to become familiar with cultural differences in families, health beliefs, and be exposed to patterns of practice that might either enhance or undermine good diabetes management in the patient.[6]

Other aspects of lifestyle changes should include increasing physical activity and consumption of healthy food choices. In a landmark Diabetes Prevention Program study, it was found that modest lifestyle modification, physical activity, and modest weight loss of 5% to 7% help prevent or delay new diagnoses of diabetes.[7-9] Huffman and Vaccaro found that physical activity can improve health outcomes in individuals with type 2 diabetes mellitus as well, and such activity is said to improve insulin sensitivity, reduce insulin requirement, and help improve glucose tolerance.[10,11] Healthy eating and understanding the impact of food on glycemic control has also been identified as a very critical part of managing diabetes. There is evidence that healthy eating can help improve glycemic control and lipid profile, maintain BP within range, and promote weight loss and maintenance.[12]

Medications play a significant part in management of diabetes mellitus and glycemic control. The ADA recommends starting monotherapy with metformin in addition to lifestyle changes in order to achieve A1c goals.[12] However, if this is not achieved within 3 months, it is important to move the patient along the continuum of care to a two-drug combination therapy (within the following 3 months) or to a three-drug combination therapy (3 to 6 months thereafter) if goal is still not being achieved.[1,12] Adhering to this timing and not delaying therapy are critical to reducing patient exposure to a persistent hyperglycemic state, which can in turn lead to poor outcomes and risk of long-term complications. It is important to note that some patients may require more complex therapy (insulin) to achieve desired goal.[1,12]

Though not applicable to every Black patient, it is essential for providers to be cognizant that Black patients tend to have reservations toward starting on insulin, as this is often perceived as the worsening of diabetes. Patient reluctance to begin insulin therapy should be explored and addressed to alleviate any concerns. In addition, accelerated therapy progression should be promoted (if required) for the patient to achieve euglycemia. As the provider, it is important to abate the fear of insulin use early in the process. Helping patients understand that diabetes mellitus is a progressive disease by nature, whereby patients with type 2 diabetes mellitus may eventually require insulin, will increase adherence and decrease resistance to insulin therapy if and when it is indicated.[1] Providers must explain to the patient and reassure them that starting insulin should not be viewed as a negative step but rather as another option to reach glycemic goals and lower the risk of poor outcomes.

Overall, the provider's choice of treatment should be guided following a patient-centered, culturally-congruent approach when deciding on pharmacologic agents. When selecting pharmacologic therapy for patients in this population, considerations should include efficacy, cost, potential adverse reactions, and effects on weight, comorbidities, hypoglycemia risk, and patient preferences to increase adherence to therapy.[1]

The role of diabetes educators

Empowering patients to learn diabetes self-management is very important to their success. DSME is a critical aspect of a patient's management of diabetes. The role of the diabetes educator is to help patients improve diabetes self-care. Referring patients to a diabetes educator for diabetes education in a timely manner will enable the patient to acquire skills required for everyday management of their disease.[13] This can be achieved if the educator helps the patient be knowledgeable of the etiology of his or her disease, what the patient can do in order to maintain glycemic control, and how to reduce risk of developing short- and long-term complications. The diabetes educator is in a unique position to help patients understand aspects of disease management, including: blood glucose monitoring, interpreting the results, identifying patterns, carbohydrate counting, taking medications or use of insulin, importance of physical activity, and identifying/treating hypoglycemia. Part of the provider's responsibility is to help the patient identify a diabetes educator who understands and provides care in a culturally-competent manner and makes a referral to a comprehensive, recognized program.[6]

Blood glucose monitoring

Monitoring blood glucose is an essential part of diabetes treatment. There is need for patients to understand the importance of controlling blood glucose and the impact it can have in preventing serious complications. The position statement on self-monitoring blood glucose (SMBG) by the American Association of Diabetes Educators (AADE) reports that when patients understand the benefits of SMBG on A1c and are trained on interpretation of the results, they have fewer negative feelings toward monitoring.[14]

SMBG by patients including those not on insulin therapy provides immediate feedback to the patient and allows the provider to have a better picture of patient's response to therapy beyond just A1c results.[14] By monitoring blood glucose, patients can determine whether they are reaching their overall treatment goals, understand how diet, exercise, and other factors (such as illness or stress) affect their blood glucose levels, and be able to identify blood glucose levels that are dangerously high or low in a timely manner.[14] Although the frequency of SMBG is dependent on the type of diabetes and treatment plans, healthcare providers should not only make recommendations for SMBG but should explicitly instruct the patient on when to perform blood glucose testing; they should also provide the patient with blood glucose targets that enable them to evaluate if they are achieving their blood glucose goals.[1]

Barriers to treatment

Many factors can create barriers for Black patients (especially socioeconomically) that impact effective diabetes management. The average Black household median income in 2012 was $33,762 in comparison to $56,565 for non-Hispanic White households, as a result of managing the disease may be more taxing, and the risk of poor diabetes management is higher in Black patients.[15]

Access to healthy foods sometimes proves to be very challenging for many Black patients who live in the inner cities and lower socioeconomic neighborhoods. According to the Food Research and Action Center (...there is lack of access to low-cost fresh fruits and vegetables—especially in lower income households making less than $24,000 per year; therefore, they resort to fast foods and shopping at small neighborhood convenience stores where it is not easy to get fresh fruits and vegetables.[16] Being aware that a lack of access can pose a barrier to eating healthy foods, which in turn can have negative effects on glycemic control, is a very important aspect of overall management of the patient.

Dietary nonadherence due to food choices and individual preferences can sometimes become an issue creating a barrier to overall control of blood glucose. The foods many Black patients tend to eat are high in carbohydrates and fat. Patients may need reinforcement of healthy eating education, reminders, or even practical demonstration of healthy alternatives before diet changes can be made.

The cost of treatment can also be a barrier to optimal care. All insurance companies do not pay for diabetes education or testing supplies, and even when they do, patients may not able to afford copays for their medications and test strips. From experience, family members share glucose monitoring devices and test strips to help defray the cost of testing. The downside to this practice is that the educator or healthcare provider is not able to track individual patient results and may be misguided with treatment plans. Having patients document their own blood glucose readings in a logbook can be helpful with treatment management. Patients have also reported skimming on medication to make it last; therefore, the provider must also address any underlying issues when patients are having difficulty achieving glycemic control.

The issue of patient-provider trust continues to be an issue within the Black community. Some Black patients distrust physicians and medications due to past history of incidences such as the Tuskegee Syphilis Study (conducted from 1932 until 1972), which deliberately withheld treatment to study participants who were exposed to syphilis, leading to the death of many participants from advanced syphilis.[17] This has fostered belief that since they were lied to before, they could be lied to again.[15] The clinician needs to build a level of trust before most Black patients can open up and speak openly and honestly about their condition.[17] The provider needs to understand that the patient may apply what is referred to as protective silence if the patient feels the provider has been intrusive and this may require stepping back by the provider to explain the purpose of the questioning and its pertinence to the patient's care.[17] It is also important for the provider to pay attention to both verbal- and nonverbal behaviors and address this observation in a nonjudgmental and culturally-appropriate way.[17]

Addressing comorbidities

Black patients are more likely to have poorly controlled BP, high lipids, and increased incidence of complications, such as myocardial infarction, stroke, and kidney failure. According to Saffar and colleagues, there is disparity in the management of dyslipidemia in Black patients; Black patients received less than optimal therapy in achieving lipid goals, and their treatment is often inferior to other racial groups.[18] Therefore, in addition to standard preventive care to reduce the risk of diabetes-related complications, it is important that the healthcare provider adequately treat the BP to goal and control lipid levels to help reduce the risk of cardiovascular events in this population.

Treatment of hypertension is more challenging to control in Black patients, and many of these patients may require combination therapy to achieve their ideal goals. It is important for providers to work with the patient to achieve desired goals. The International Society on Hypertension in Blacks (ISHIB) recommends that Black patients do not stay on monotherapy for a prolonged period of time but to consider combination therapy when the BP is greater than 15/10 mm Hg above goal levels to control BP and protect against target organ damage.[19] According to the Eighth Joint National Committee (JNC 8), when initiating pharmacologic therapy for hypertension in the general

Summary of available resources

Name of program	Organization or affiliation	Description of program
Choose to Live	American Diabetes Association	Diabetes Awareness program for women age 35-55
Live Empowered	American Diabetes Association	Awareness to seriousness of diabetes and importance of healthy lifestyle choices
Project POWER	American Diabetes Association	Faith-based program at churches that infuse diabetes awareness messages for members
New Beginnings	National Diabetes Education Program	Storytelling toolkit used to educate patients on management and emotional side of diabetes
AADE7 Self Care Behaviors	American Association of Diabetes Educators	Behavioral goals toolkit dealing with healthy eating, being active, monitoring, taking medications, problem solving, reducing risks, and healthy coping

Black population for patients with or without diabetes, but with no evidence of chronic kidney disease, it is recommended to start with drugs in the calcium channel blockers, or thiazide diuretics class.[20] In addition, patients should be encouraged to reduce alcohol and sodium intake, increase physical activity, and increase consumption of fruits and vegetables. There should also be a discussion on importance of modest weight loss and smoking cessation to reduce comorbidities in these patients.[21]

Synthesis of evidence

There are varying levels of evidence that support the various assertions above for patients with diabetes; however, this should be applied with even more prudence for Black patients, as they are disproportionately and negatively impacted by complications associated with poorly controlled diabetes. Diabetes self-management is graded as Level B evidence by the ADA indicating that there is supportive evidence to the benefits of DSME from well-conducted cohort studies and meta-analysis of cohort studies.[22]

There is evidence supporting meeting the desired goal of BP less than 130/80 in patients with type 2 diabetes mellitus. This conclusion is based on research results that addressed clinical outcomes using some method of scientific investigation. Research shows that achieving the goal systolic BP (SBP) less than 135 mm Hg reduces the risk of mortality and nephropathy in patients with type 2 diabetes, while achieving an SBP less than 130 mm Hg additionally reduces risk of stroke in these patients. Controlling diastolic BP is equally important with evidence showing a reduction in mortality, myocardial infarction, and stroke when a diastolic goal of less than 80 mm Hg is achieved.[22]

Atherogenic cholesterol-containing lipoprotein particles (particularly LDLs) have been identified in increasing the risk of cardiovascular heart disease and atherosclerotic cardiovascular disease (ASCVD).[23] Controlling lipid levels in patients with diabetes mellitus, especially low-density lipoprotein cholesterol (LDL-C) levels even has a higher level of evidence.

It is worth noting that the American College of Cardiology (ACC) and the American Heart Association (AHA) no longer recommend for or against specific LDL-C or non-HDL-C targets for primary or secondary prevention of ASCVD due to inadequate evidence from randomized trials to use only LDL-C or HDL-C to decide treatment goals.[23] Rather, the "2013 ACC/AHA guideline on the treatment of blood cholesterol to reduce ASCVD risk in adults" was based on systematic review evidence from high-quality randomized trials recommending who should get therapy and at what intensity.[23] Patients with diabetes were one of the four groups recommended for statin therapy, and statins are considered beneficial for patients with diabetes between 40 and 75 years of age with LDL-C 70-189 mg/dL.[23] A tool to determine appropriateness of therapy and intensity is available at: tools.cardiosource.org/ASCVD-Risk-Estimator/.

Resources for helping Black patients

There are many resources available targeting the Black population with diabetes. These programs can be adapted in various settings, such as through church, sororities, community or nonprofit organizations, and even support groups within a clinical setting. Many of the programs focus on continuous support of the patient through education, storytelling, and sharing experiences of barriers and success stories in a culturally appropriate manner. It is imperative that providers not only identify patients who are struggling with managing or coping with their diabetes but provide them with appropriate and culturally sensitive resources and tools to help them improve their diabetes outcomes (see *Summary of available resources*).

The ADA has different programs geared toward Black patients. The programs include "Choose to Live," a diabetes

awareness toolkit targeting Black women between the ages of 35 and 55; "Live Empowered," which brings awareness to the seriousness of diabetes and importance of healthy lifestyle choices; and "Project POWER," a faith-based program that allows churches to infuse diabetes awareness messages and provides lessons on healthy living, which can improve the health outcomes of its members with diabetes.[1]

The National Diabetes Education Program (NDEP) is another program through the CDC that develops culturally appropriate resources. NDEP has a toolkit called "New Beginnings," which targets Black patients.[24] This discussion guide uses storytelling to educate patients about their diabetes. It deals with topics, such as the emotional side of diabetes, how to communicate with the healthcare provider, healthy coping, and the role of family and spiritual belief in managing diabetes.

It is important to explain any changes in treatment to the patient, avoid medical jargon, and use "teach back" methods.

The key to healthy diabetes management is the patient's behavior toward the disease. Providers should make every attempt to assist patients in achieving this goal. The AADE behavioral goals toolkit, "AADE7 Self Care Behaviors," can be used in appropriate cultural context to address important aspects of managing diabetes, such as healthy eating, being active, monitoring, taking medications, problem solving, reducing risks, and healthy coping. It also provides short but important information of the different topics and provides patients activities to do in order to reinforce the message.[25,26]

Another important aspect of diabetes management in Black patients that is often overlooked is importance of patient morale, family involvement, and understanding the relevance of spiritual beliefs on health decisions. It is important as the healthcare provider not to neglect addressing the family dynamics of the patient and the positive or negative roles this may play in the patient's management of diabetes. In a study by Chesla and colleagues looking at the influence of family on the health and health practices in Black patients with type 2 diabetes mellitus, it was reported that patients repeatedly identified family members as important to diabetes management.[27] The study concluded that there is a strong correlation between family support and management of diabetes in Black patients followed by family beliefs. The patient's morale is however reported most related to family context. The patients reported more depressive symptoms when family members were not supportive.[27]

Moving forward

Diabetes is an ongoing progressive disease that changes over time and requires the provider to be vigilant. Being adept at addressing not only the patient's present condition but also the progressive nature of the disease will increase the patient's willingness to comply with treatment plans. It is important to explain any changes in treatment to the patient and to avoid medical jargon along with the use of tools, such as "teach back," which entails asking the patient to repeat the instruction in their own words to validate the patient's understanding of new instructions. Patient efforts toward self-efficacy should be acknowledged, and they should continually be encouraged to express any concerns and challenges they are facing that may pose a hindrance to successfully managing their diabetes.

Understanding cultural nuances and maintaining open mindedness when working with Black patients while acknowledging that not all patients have the same beliefs provides a holistic, individualistic approach to care. NP

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