

Exploring Diabetes: Symptoms, Diagnosis, and Coping Strategies

Abstract

Diabetes is a chronic metabolic disease that poses a serious threat to human health. It is primarily classified into three types: Type 1, Type 2, and gestational diabetes. Early symptoms are not obvious, and poor long-term blood sugar control can lead to various complications affecting vital organs such as the cardiovascular system, kidneys, nerves, eyes, and feet. Diagnosis mainly relies on blood glucose levels, including fasting blood glucose, random blood glucose, and glycated hemoglobin (HbA1c). Treatment methods include insulin injections, oral hypoglycemic drugs, and lifestyle interventions. The key to preventing diabetes lies in weight control, a reasonable diet, moderate exercise, and regular blood glucose monitoring. Maintaining a positive mindset also helps in preventing and improving the condition. In summary, actively preventing diabetes by starting with lifestyle habits is imperative.

Keywords: Diabetes, Symptoms, Diagnosis, Coping Strategies

1: Introduction to Diabetes

Diabetes is a chronic metabolic disease characterized by persistently elevated blood glucose levels. The occurrence of diabetes is closely related to insufficient insulin secretion or reduced cellular sensitivity to insulin. When insulin secretion is insufficient, glucose in the body cannot be effectively utilized, leading to abnormal increases in blood sugar levels and ultimately causing diabetes. Diabetes is not just a matter of elevated blood glucose levels; long-term poor control can have serious health consequences.

The dangers of diabetes extend beyond abnormal blood glucose levels. More seriously, it can lead to acute and chronic complications. Among the acute complications, diabetic ketoacidosis and hyperglycemic hyperosmolar syndrome are particularly typical. Diabetic ketoacidosis primarily occurs in patients with type 1 diabetes, but it can also occur in type 2 diabetes patients under conditions of insulin deficiency. This condition arises because the lack of insulin in the body prevents glucose from being utilized by cells, forcing the body to break down fat for energy. During this process, the production of ketone bodies leads to increased acidity in the blood, resulting in diabetic ketoacidosis. Patients typically exhibit symptoms such as nausea, vomiting, abdominal pain, rapid breathing, and confusion. If left untreated, it can be life-threatening. On the other hand, hyperglycemic hyperosmolar syndrome mainly occurs in type 2 diabetes patients. This condition is usually associated with extremely high blood sugar levels and severe dehydration, which may lead to confusion and even coma if not promptly treated, the consequences can be equally severe.

In addition to acute complications, the chronic hyperglycemic state in diabetes can have profound effects on various systems of the body, leading to a range of chronic complications. Long-term high blood sugar levels in diabetic patients can damage blood vessels and nerves, leading to a variety of chronic diseases, with cardiovascular disease being the most common. High blood glucose can damage the endothelial cells of blood vessels, increasing the risk of atherosclerosis, thereby leading to heart disease and stroke. Additionally, diabetic nephropathy is a serious complication, as high blood glucose levels can damage the filtering function of the kidneys, leading to proteinuria, and eventually progressing to kidney failure, necessitating dialysis or kidney transplantation for the patient's survival. Diabetes can also lead to neuropathy, especially peripheral neuropathy, which manifests as numbness and pain in the limbs. In severe cases, it may result in foot ulcers and infections, sometimes requiring amputation. Diabetic retinopathy, which damages the microvasculature in the eyes, can cause vision loss and, in severe cases, blindness. Furthermore, diabetes makes individuals more susceptible to foot problems and gum disease, which also require sufficient attention.

Regarding the classification of diabetes, type 1 diabetes, type 2 diabetes, and gestational diabetes are the most common types. Type 1 diabetes is an autoimmune disease in which the immune system mistakenly attacks and destroys the beta cells in the pancreas, preventing normal insulin production. This type of diabetes usually develops in childhood and adolescence, but it can also occur in adulthood. Patients with type 1 diabetes need lifelong insulin therapy as their bodies cannot produce sufficient insulin. In contrast, type 2 diabetes is the most common form of diabetes. The pathogenesis of type 2 diabetes is mainly related to insulin resistance and insufficient insulin secretion. Insulin resistance means that the sensitivity of cells to insulin is reduced, making it difficult for insulin to effectively help glucose enter the cells, leading to elevated blood glucose levels. This type of diabetes usually develops in adulthood, but in recent years, due to lifestyle changes, an increasing number of young people have been diagnosed with type 2 diabetes. The development of type 2 diabetes is closely related to being overweight, obesity, unhealthy diet, and lack of physical activity. Therefore, improving lifestyle factors such as adopting a healthy diet, engaging in regular physical activity, and maintaining a healthy weight can effectively reduce the risk of developing type 2 diabetes. Gestational diabetes, on the other hand, is diabetes that is first identified during pregnancy, usually diagnosed through screening in the mid-pregnancy. The development of gestational diabetes is associated with hormonal changes during pregnancy that may interfere with the action of insulin, leading to elevated blood sugar levels. Although gestational diabetes usually resolves after childbirth, it increases the risk of developing type 2 diabetes later in life. Therefore, women who have had gestational diabetes should continue to monitor their blood glucose levels regularly after childbirth and maintain a healthy lifestyle to reduce their future risk.

Managing and preventing diabetes requires a comprehensive approach that combines lifestyle adjustments with medication. A balanced diet and regular physical activity

form the foundation of diabetes management. By controlling sugar and fat intake in the diet and increasing fiber intake, blood glucose levels can be effectively managed. Additionally, increasing physical activity not only helps control weight but also enhances insulin sensitivity, allowing for better blood glucose management. Moreover, quitting smoking and limiting alcohol intake are crucial aspects of diabetes management, as tobacco and alcohol can negatively impact blood sugar control and increase the risk of complications. Medication plays an important role in diabetes management, particularly for those who have already been diagnosed. For patients with type 1 diabetes, insulin therapy is essential since their bodies cannot produce sufficient insulin. For patients with type 2 diabetes, medication options are more varied, including oral hypoglycemic agents like metformin and sulfonylureas. With advances in technology, new treatment methods are also emerging, such as GLP-1 receptor agonists and SGLT-2 inhibitors, which not only help control blood glucose but also have weight loss and cardio-renal protective effects.

Regular monitoring of blood glucose is an indispensable part of diabetes management. By self-monitoring blood glucose levels, patients can better understand the fluctuations in their blood sugar, allowing them to adjust their diet, exercise, and medication plans to achieve optimal blood glucose control. For long-term diabetes management, doctors may also recommend regular HbA1c tests, an important indicator that reflects the average blood glucose level over the past 2-3 months and helps assess the overall effectiveness of diabetes control. Through effective diabetes management and proactive prevention measures, patients can better control their condition, avoid or delay the onset of complications, and thereby improve their quality of life. This is especially important for individuals with a family history of diabetes or other high-risk factors, as taking preventive measures early on is crucial. Diabetes is not only a disease that requires lifelong management but also a chronic condition that can be significantly improved through scientific management and prevention, ultimately enhancing the quality of life.

2: Diagnosis and Treatment of Diabetes

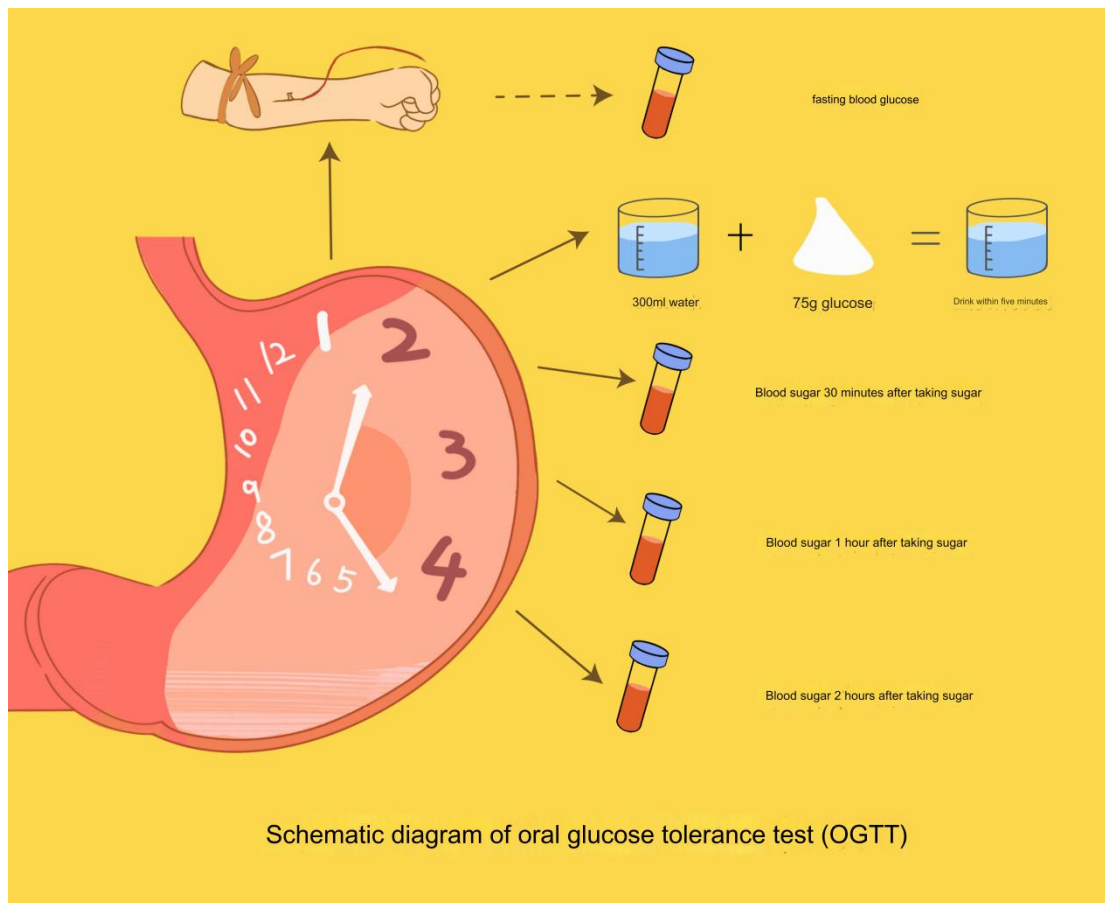
Diabetes is a lifelong condition, and early diagnosis and timely treatment are crucial for preventing or delaying the onset of complications. With advancements in medical technology, the diagnostic methods and treatment approaches for diabetes are continually being optimized and updated, providing patients with better management options.

In the diagnosis of diabetes, blood glucose testing is undoubtedly the most critical indicator. Clinically, fasting blood glucose, postprandial blood glucose, and random blood glucose are the most common testing methods. Fasting blood glucose testing is usually recommended in the morning, after at least 8 to 10 hours of fasting (except for water). This is because blood glucose levels are more stable in a fasting state, unaffected by food intake, allowing for a more accurate reflection of insulin secretion. Normal fasting blood glucose levels typically range between 3.9 and 6.1 mmol/L. If fasting blood glucose levels exceed 7.0 mmol/L on multiple occasions, diabetes can

be diagnosed. Compared to fasting blood glucose testing, random blood glucose testing can be done at any time of the day, regardless of meal times. If random blood glucose levels exceed 11.1 mmol/L, diabetes can also be confirmed. This method is particularly suitable for patients with obvious diabetes symptoms, such as excessive thirst, frequent urination, excessive hunger, and unexplained weight loss. To assess the body's ability to regulate blood glucose after meals, the 2-hour postprandial blood glucose test is more effective. Normally, postprandial blood glucose levels should return to near fasting levels within 2 hours. If the blood glucose value exceeds 11.1 mmol/L at this time, it may indicate the presence of diabetes.

During initial screening, testing for glucose in the urine is also a commonly used method. Under normal circumstances, urine should not contain glucose, as the kidneys reabsorb all glucose from the blood. When blood glucose levels are too high, the kidneys' reabsorption capacity is exceeded, and glucose begins to appear in the urine, a condition known as "glycosuria." Although a positive glycosuria result cannot diagnose diabetes, it suggests the possibility of hyperglycemia, warranting further blood glucose testing. If blood glucose levels are above normal but do not meet the criteria for diabetes diagnosis, the oral glucose tolerance test (OGTT) is an important screening tool. OGTT is mainly used to assess the body's ability to regulate blood glucose. The test involves first measuring fasting blood glucose levels to establish a baseline, followed by the patient consuming a solution containing 75 grams of glucose. Blood glucose levels are then measured again 2 hours after ingesting the solution. Normally, blood glucose peaks about 1 hour after the meal and should fall to near fasting levels within 2 hours. If the 2-hour blood glucose level is higher than 11.1 mmol/L and fasting blood glucose exceeds 7.0 mmol/L, diabetes can be

diagnosed.confirmed.



Moreover, Hemoglobin A1c (HbA1c) testing is considered the gold standard for evaluating blood glucose control. HbA1c is a product formed when glucose binds to hemoglobin in red blood cells, and its level reflects the average blood glucose over the past 2 to 3 months. Therefore, HbA1c testing is a crucial tool in the long-term management of diabetes. Typically, an HbA1c level above 6.5% indicates a diagnosis of diabetes, while for patients already diagnosed with diabetes, maintaining an HbA1c level below 7% is considered a good management goal.

In the treatment of diabetes, controlling blood glucose levels is key to preventing complications. Treatment approaches primarily include lifestyle interventions, medication therapy, and regular monitoring. A healthy lifestyle is the foundation of diabetes treatment, especially for patients with type 2 diabetes, where lifestyle changes can significantly improve blood glucose control and even reverse diabetes in its early stages. In terms of dietary management, diabetic patients should follow a diet low in sugar, low in fat, and high in fiber. Reducing the intake of simple carbohydrates, such as sugar and sweets, and increasing the consumption of whole grains, vegetables, and fruits can help control blood glucose levels. Additionally, portion control and avoiding overeating are essential for maintaining stable blood glucose levels. In terms of exercise, regular moderate-intensity aerobic activities such as walking, swimming, and cycling can improve insulin sensitivity and help control blood glucose. Engaging in at least 150 minutes of exercise per week is beneficial not

only for weight control but also for significantly improving blood glucose levels. At the same time, weight management is a crucial aspect of lifestyle intervention for diabetic patients. Overweight and obesity are significant risk factors for type 2 diabetes, and achieving and maintaining a healthy weight through a combination of diet and exercise can improve insulin sensitivity and reduce the risk of cardiovascular disease.

When lifestyle interventions are insufficient to control blood glucose levels, medication therapy becomes essential. The treatment approach varies depending on the type of diabetes. For patients with type 1 diabetes, lifelong insulin therapy is necessary. Insulin comes in various types, including short-acting, intermediate-acting, and long-acting, which can be tailored to the patient's blood glucose fluctuations. Common insulin therapy regimens include multiple daily subcutaneous insulin injections or continuous insulin infusion using an insulin pump. For patients with type 2 diabetes, treatment typically begins with oral hypoglycemic agents, such as Metformin, which helps control blood glucose by reducing hepatic glucose production and increasing insulin sensitivity. Other commonly used oral medications include sulfonylureas, DPP-4 inhibitors, and SGLT2 inhibitors. If oral medications fail to effectively control blood glucose, the doctor may recommend insulin therapy.

To better evaluate treatment effectiveness and prevent complications, diabetic patients need to regularly monitor their blood glucose levels. Self-monitoring of blood glucose is an important aspect, where patients should regularly use a glucose meter at home to monitor blood glucose levels, especially fasting and postprandial blood glucose. By recording daily blood glucose values, patients and doctors can better assess treatment effectiveness and adjust medication dosages in a timely manner. Additionally, HbA1c testing should be conducted every 3 to 6 months to evaluate long-term blood glucose control. HbA1c levels can help doctors determine the effectiveness of the current treatment plan and make adjustments as needed.

Diabetes complications affect multiple systems, and prevention and early management are crucial. Diabetic patients should undergo regular eye examinations to detect retinopathy early and receive timely treatment. Diabetic retinopathy is one of the leading causes of blindness, making it essential to have an annual eye exam. Additionally, diabetic nephropathy is a common cause of kidney failure, so patients should regularly undergo tests for urine protein and serum creatinine to evaluate kidney function. Early detection of nephropathy can help take measures to slow disease progression. In the nervous system, diabetic neuropathy can cause symptoms such as numbness and pain in the limbs, so patients should undergo regular neurological assessments to detect early nerve damage. Similarly, diabetes increases the risk of cardiovascular disease, so patients should regularly monitor blood pressure, blood lipids, and undergo ECGs to assess cardiovascular health. Lastly, diabetic foot is a major cause of amputation, so patients should inspect their feet daily for wounds or ulcers and have a professional foot examination annually.

Through the aforementioned diagnostic and treatment methods, diabetic patients can effectively manage their condition, delay the onset of complications, and improve their quality of life. Diabetes treatment is a long-term process, requiring patients to work closely with their doctors, undergo regular health evaluations, and adjust their treatment plans to achieve optimal health outcomes.

3: Prevention and Improvement of Diabetes

Preventing and managing diabetes requires a comprehensive approach, with a primary focus on improving lifestyle habits. In modern society, while life has become more convenient and comfortable, these changes have also brought about various health issues, particularly the rising incidence of diabetes. Obesity is one of the significant risk factors for type 2 diabetes, and the imbalance between calorie intake and calorie expenditure leads to increasing obesity rates. Therefore, one of the keys to preventing diabetes lies in weight control, which requires us to manage our diet and increase physical activity in our daily lives.

First, from a dietary perspective, a balanced diet not only helps maintain normal blood glucose levels but also effectively prevents obesity. High-sugar, high-fat, and high-calorie foods are often the culprits behind obesity, leading to weight gain and possibly triggering insulin resistance, which significantly increases the risk of diabetes. Therefore, it is crucial to reduce the intake of such foods. We should focus more on choosing low-sugar, low-fat, and high-fiber foods, such as whole grains, fresh vegetables, and fruits. These foods are rich in fiber, which helps control blood sugar levels. Additionally, foods rich in vitamins and minerals, such as leafy greens, nuts, and seeds, have significant benefits in enhancing insulin sensitivity and improving pancreatic β -cell function. To reduce the risk of diabetes, we should also decrease our consumption of sugary drinks, fast food, and processed foods.

In addition to choosing the right foods, regular eating habits are also essential. Consistent meal times help the body manage blood glucose levels more effectively, avoiding large fluctuations in blood sugar. Meanwhile, controlling portion sizes and avoiding overeating are also crucial for maintaining stable blood sugar levels. By following these dietary management strategies, individuals can effectively lower the probability of developing diabetes in their daily lives.

Besides diet control, increasing physical activity is another important means of preventing diabetes. Exercise not only helps burn excess calories and prevent weight gain but also boosts metabolism and enhances insulin sensitivity, leading to better blood sugar control. Numerous studies have shown that regular physical activity can significantly reduce the risk of type 2 diabetes. Therefore, engaging in at least 150 minutes of moderate-intensity aerobic exercise per week, such as brisk walking, swimming, or cycling, is highly recommended. These forms of exercise are simple, easy to perform, and beneficial to various body systems. For those who have limited

time or are not accustomed to intense exercise, small daily habits can also contribute to diabetes prevention. For example, walking to and from work or taking short breaks for stretching during work hours can make a positive impact on health over time, even if these changes seem insignificant. Additionally, strength training is an effective exercise method that can increase muscle strength, improve basal metabolic rate, and effectively reduce insulin resistance, further lowering the risk of diabetes.

Moreover, regular health check-ups, particularly blood glucose monitoring, are effective measures for preventing and early detection of diabetes. For those who already have diabetes, regular blood sugar testing helps monitor disease progression and adjust treatment plans as needed. Self-monitoring of blood glucose allows patients to better manage their condition and reduce the risk of complications. For individuals without diabetes, regular blood glucose testing can detect abnormalities early, enabling the adoption of preventive measures. For example, individuals who are overweight, have a family history of diabetes, or suffer from high blood pressure or high cholesterol should undergo regular diabetes screenings, such as fasting blood glucose tests and hemoglobin A1c tests. These tests help doctors understand a patient's blood sugar control and provide timely interventions if necessary, preventing the onset of diabetes.

Early intervention is crucial in diabetes prevention. If blood sugar levels are found to be elevated during a health check-up but have not yet reached the diagnostic criteria for diabetes, doctors usually recommend lifestyle adjustments such as dietary control, increased physical activity, and weight loss. These interventions can effectively lower blood sugar levels, halt the progression of diabetes, and, in some cases, reverse the prediabetic state.

In addition to physiological measures, mental health and emotional management play important roles in the prevention and improvement of diabetes. Chronic stress and negative emotions can affect the body's endocrine system in various ways, increasing insulin resistance and ultimately leading to elevated blood sugar levels. The fast-paced life and high-pressure work environment of modern society have led to an increasing number of people facing mental health issues. If left unaddressed, these issues may have long-lasting effects on physical health. Therefore, maintaining a positive mindset and a healthy lifestyle is crucial for preventing and improving diabetes. By adjusting the pace of work and life and developing healthy habits such as regular sleep patterns and appropriate recreational activities, stress can be effectively alleviated. Additionally, learning stress management techniques, such as meditation, deep breathing, and yoga, can help maintain mental balance and reduce the impact of negative emotions on the body. Maintaining good communication with family and friends and building a strong social support network can also help better cope with life's challenges during times of emotional distress.

In conclusion, preventing and improving diabetes is an ongoing process that encompasses various aspects of life. By managing our diet, increasing physical

activity, undergoing regular health check-ups, and maintaining a positive attitude, we can effectively reduce the risk of diabetes and provide better management options for those already affected, ultimately improving their quality of life. Everyone should pay attention to their health, take proactive measures, and stay away from the challenges of diabetes, allowing them to enjoy a healthier and more fulfilling life.

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