

**The Importance of Proper Dietary Interventions in the Management and Prevention of Type 2 Diabetes**

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## **Abstract**

According to the International Diabetes Federation (IDF), diabetes has been identified as one of the largest global health emergencies of the 21<sup>st</sup> century. There are many factors that contribute to type 2 diabetes including diet, weight, age and family history. While some factors such as genetics cannot be changed, factors such as diet are key in the prevention and treatment of diabetes. Individuals with diabetes should receive nutritional advice from registered dietitians in order to optimize their dietary intakes and eating patterns.

## **Case History**

Within a few weeks of working in Winkler it became apparent that there was a high prevalence of diabetes in the patient population. During the interactions, providing nutritional and other lifestyle advice such as smoking cessation and pharmacotherapy was discussed and provided to all patients. Although this advice was provided to patients, many still struggled to properly modify their dietary patterns. However, one patient during my five weeks in Winkler broke that pattern. This was a 57-year-old male who was initially diagnosed with type 2 diabetes in May 2018 with a hemoglobin A1C (HbA1c) level of 10%. During his initial visit he was educated on physical activity and nutrition. During his second appointment he was put on 250mg of Metformin BID, which was later increased to 500mg. He was given tracking sheets to monitor his diet and scheduled an appointment with the registered dietitian that worked in the clinic. By his third visit in June 2018, he had lost 17 pounds and his non-fasting glucometer readings decreased from 19 to below 10 and his morning fasted readings decreased from greater than 10.75 to between 3.8 to 6.5.

## **Discussion**

Type 2 diabetes is characterized by hyperglycemia due to insulin resistance and in some cases impaired insulin secretion.<sup>1</sup> There are a number of factors that contribute to the development of the disease. Individuals with a family history in any first degree relative have a two to three-fold risk of developing diabetes and furthermore, the risk of diabetes increases up to five to six-fold in those with both a maternal and paternal history of type 2 diabetes. Obesity and fat distribution also play an important role in the development of the disease. The incidence of type 2 diabetes is highest in those with a more central or abdominal fat distribution.

Many members of the population with little medical knowledge do not realize how serious of a disease diabetes truly is. It is important that the population be made aware that it is critical to get tested for diabetes if they are at risk. If left untreated or improperly managed, diabetes can cause a number of life or limb threatening complication including but not limited to heart attack, stroke, blindness, kidney failure, impotence and amputation.

There are some factors such as genetics we cannot change. However, dietary habits that go onto to contribute to obesity and poor weight distribution can be used both as a preventative and disease management tool. During my time in Winkler, it became apparent that many individuals did not know how to modify their diet in order to reduce caloric intake in a healthy and sustainable way. During their initial visits with the physician, patients were given a dietary log sheet to record their daily intake. This served two purposes: firstly it provided the physician with a better understanding of the patient's daily patterns and secondly, provided the patient with a realization of where their diet could be improved upon. Often the food groups that were consumed in excess were carbohydrates and unhealthy fats. A part of the problem was a lack of knowledge that carbohydrates break down into sugars in the body and many patients also followed the incorrect logic that completely cutting out carbohydrates and fats was the solution. Figure 1 shows the 2018 clinical practice guidelines determined by Diabetes Canada.

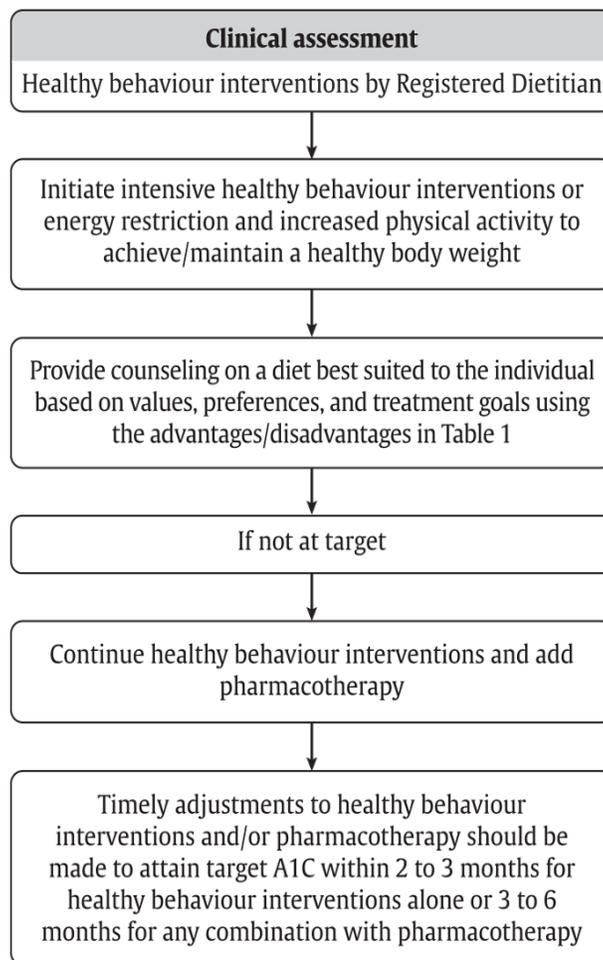


Figure 1. Nutritional Management of Hyperglycemia in Type 2 Diabetes <sup>2</sup>

According to the 2018 Diabetes Canada guidelines, patients with diabetes should exchange high glycemic index foods for low glycemic index foods to reduce the glycemic response after carbohydrate consumption. As an example, among men and women participating in the Health Professionals Follow-up Study and the Nurses' Health Study (NHS), high brown rice intake was associated with a lower risk of type 2 diabetes in contrast to white rice which was associated with a higher risk of type 2 diabetes.<sup>1</sup> In terms of fat consumption, a diet low in trans fatty acids is associated with less coronary heart disease. Guidelines also recommend substituting monounsaturated fatty acids (MUFA), which can be found in avocado, nuts, seeds and olive oil in place of saturated fatty acids.

In addition to all the dietary modifications patients must make to prevent or control diabetes, they also have to filter through a number of diets they may hear about either from their medical provider or some other source such as social media. For example, the Mediterranean diet is a plant-based diet that includes a high intake of fruits, vegetables, nuts, seeds and whole grains, moderate-to-high consumption of healthy fats such as olive oil, and a low to moderate intake of meat and dairy. Evidence supports this Mediterranean-style diet as studies have shown that its implementation in overweight individuals with newly diagnosed type 2 diabetes reduces HbA1c levels, delays the need for antihypertensive drug therapy and increases rates of disease remission when compared to a low fat diet.<sup>3</sup>

Another popular diet is the Dietary Approaches to Stop Hypertension (DASH) dietary pattern. This diet emphasizes increased intake of fruit, vegetables, whole grains and nuts and lesser amounts of red meats and total fats. The DASH diet has been shown to lower blood pressure compared to a typical Western diet.<sup>4</sup> Aside from its antihypertensive benefits, other studies have shown that the DASH dietary pattern also reduces HbA1c, and aids in reduction of body weight and waist circumference.

These are only a few of the dietary patterns that have been shown to have a positive impact on the prevention and control of type 2 diabetes. However, it can be overwhelming and confusing for a patient to incorporate one of these diets into their lifestyle. This compliance issue is why it's important for health care providers to have a multidisciplinary approach to diet modification. Inclusion of a registered dietician can help personalize patient meal plans and take into consideration cultural and nutritional preferences to achieve blood glucose levels within the desired range and prevent further complications. All of these factors when used together properly can maximize chances of patient compliance and positive outcomes.

## **Conclusion**

Although the medical community is aware of the benefits of a proper diet in the management and prevention of type 2 diabetes, its proper implementation still proves to be a challenge in many patients. The patient in this case was managed by a team of physicians and a registered dietician. It was through this multidisciplinary team approach that he was able to successfully manage his diabetes and prevent the occurrence of any complications of the disease. The benefits of this not only relate to this individual patient's health, but also to the Canadian health care system financially. Although excellent resources such as the Diabetes Centre do exist and provide invaluable services, I believe that there needs to be additional steps taken to improve access to the effective multidisciplinary approach. Increased access would provide assistance for all of those with or at risk of developing diabetes so that appropriate care can be provided and contribute to a healthier Canada.

## References

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