AYUSHDHARA
ISSN: 2393-9583 (P)/ 2393-9591 (O)
An International Journal of Research in AYUSH and Allied Systems

Case Study

REMISSION OF TYPE-2 DIABETES ON PLANT BASED DIET

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Article info
Article History:
Received: 15-03-2024
Accepted: 19-04-2024
Published: 07-05-2024
KEYWORDS:
Type-2 Diabetes, Diabetes Reversal, Plant Based Diet.

ABSTRACT

The incidence of diabetes has amplified worldwide, but health outcomes have not improved significantly. Anti-hyperglycemic medications are often accompanied by weight gain, hypoglycemia, and risk of cardiovascular events. Most diabetics are suggested a "low carb diet" as a nutritional strategy but the results short-termed and often unsustainable in most cases. **Aim:** This case report depicts the effectiveness of a personalized nutritional intervention program focused on Whole Food Plant Based Diet (WFPBD) and Intermittent Fasting (IF) in reducing blood glucose, body weight, waist circumference, without any pharmacological treatment. **Methods:** We present a case of a personalized nutritional intervention program of a 47-year-old diabetic female, weighing 86kg, measuring 168cm (BMI 30.5), with waist circumference of 43 inches. Her pre-intervention glycated hemoglobin (HbA1c) was 12.5%, post prandial glucose (PPG) was 342mg/dl, and fasting blood glucose (FBG) was 250mg/dl. Besides following a WFPBD, the patient was advised to do intermittent fasts of 14 hours, starting from about 6 pm in the evening and extending till about 8 am the next morning. The primary measures were changes in HbA1c, fasting and postprandial glucose levels, body weight, waist circumference, and BMI. **Results:** Nutritional intervention brought substantial improvements in several health parameters of the patient. Post-intervention, the patient was able to achieve an HbA1c of 6.40%, average FBG of 113mg/dl, average PPG of 127mg/dl, body weight of 74kg, BMI of 26.2, and waist circumference of 37 inches. **Conclusions:** The results suggest that a personalized dietary modification program combining WFPBD and IF can significantly improve metabolic health and potentially reverse T2D without the need for pharmacological treatment.

INTRODUCTION

Diabetes is one of the leading metabolic disorders that are associated with many life-threatening complications.[1] Insulin resistance is considered the major underlying cause of type-2 diabetes (T2D).[2] An increasing trend in the consumption of ultra-processed foods (UPFs) is highly associated with the rise in incidence of T2D around the world.[3] Anti-hyperglycemic medications are widely used for management of blood glucose levels. Latest research suggests that diet and lifestyle modification can play a vital role in achieving normoglycemia, potentially leading to reversal of T2D eliminating the need for pharmacological intervention.[4] In this case report, we observed sustained remission of T2D after initiation of a whole food plant-based diet (WFPBD) eliminating the need for pharmacological treatment.

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Quick Response Code	
	https://doi.org/10.47070/ayushdhara.v11i2.1502

Patient Information, Clinical Findings, and Diagnostic Assessment

We present a case of a 47-year-old female, weighing 86kg and measuring 168cm (BMI 30.5), with waist circumference of 43 inches, who was diagnosed with T2D in Punjab, India in May 2023. The patient complained of frequent urination, increased thirst, swelling in body, numbness in feet, and excessive fatigue. During the diagnosis period, her glycated hemoglobin (HbA1c) was 12.5%, post prandial glucose (PPG) was 342 mg/dl, fasting blood glucose (FBG) was 250mg/dl, and random blood glucose (RBG) was 298mg/dl. The concerned doctor prescribed metformin for glucose control. The patient desired to

reverse diabetes through lifestyle change and approached the author to assist her in dietary modification.

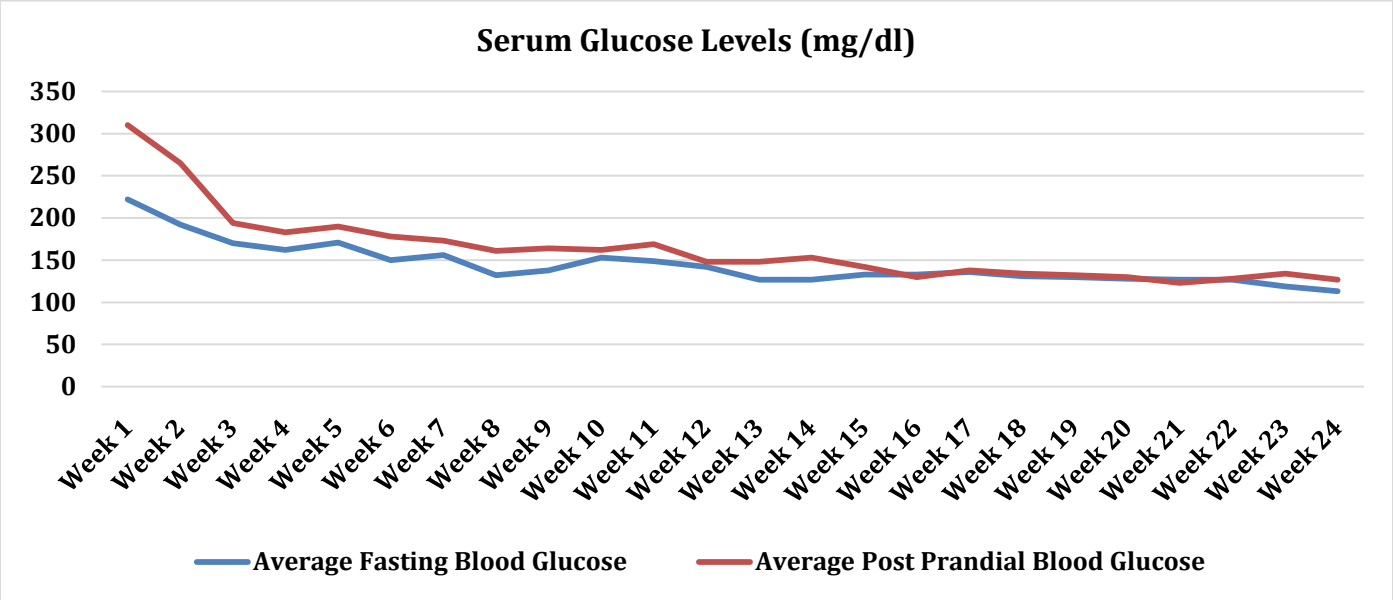
Therapeutic Intervention

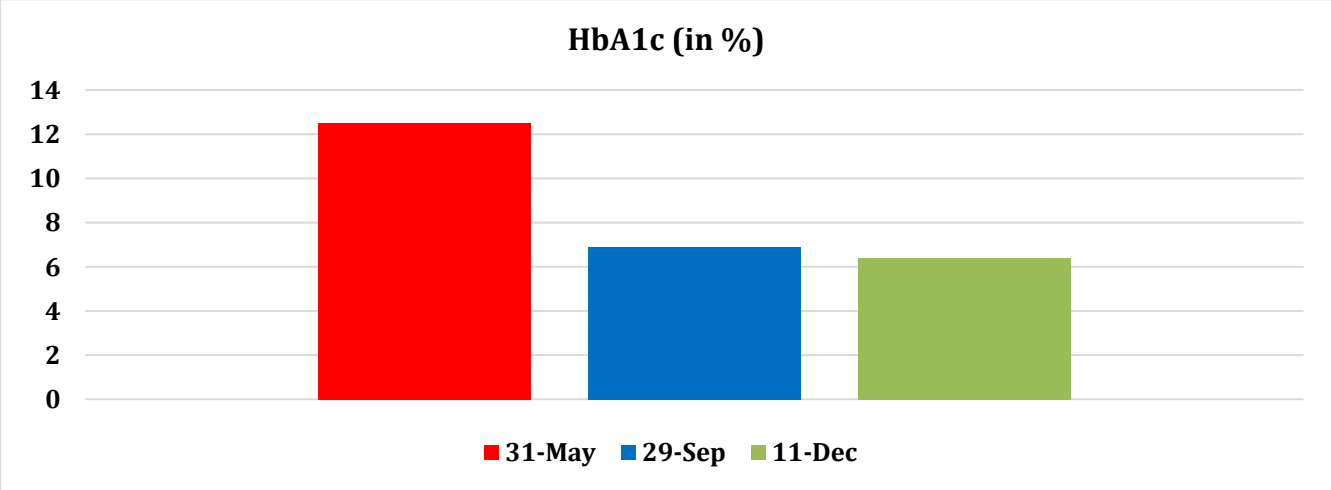
The patient agreed to follow a customized whole food plant-based diet (WFPBD) for an intervention period of 24 weeks. The prescribed diet was divided into breakfast, lunch, and dinner. Breakfast included about 500 grams of mixed fruit bowl. [5] Lunch and dinner included about 300 grams of raw vegetable salad along with a cooked vegetarian meal each time. The patient was prescribed to consume millets in cooked meals as it has a lower glycemic index as compared to conventional wheat and rice. [6] Drinks like tender coconut water and herbal tea were allowed as snacks. Consumption of nuts and seeds was also encouraged.[7] Ultra-processed food was completely eliminated from diet.[3] Refined oils were also eliminated from the diet.[8] Daily calorie intake was estimated to be around 1500kcal. Total macronutrients were estimated as carbohydrates about 320 grams, proteins about 28 grams, and fats about 20 grams. Besides following a WFPBD, the patient was advised to do intermittent fasts of 14 hours, starting from about 6 pm in the evening and extending till about 8 am the next morning.[9] Blood glucose readings of the patient were regularly monitored and periodic changes in the diet were made as situation required.

RESULTS AND DISCUSSION

The patient had an average FBG of 222mg/dl and average PPG of 310mg/dl during week 1. The patient was able to achieve an average FBG of 142mg/dl, average PPG of 148mg/dl, and HbA1c of 6.9% at week 12 of nutritional intervention. The patient further achieved an average FBG of 113mg/dl, average PPG of 127mg/dl, and HbA1c of 6.4% at week 24 of nutritional intervention. Her fasting sugar was 102mg/dl on 11th Dec 2023. Her waist circumference reduced from 43" to 37" consistent with a 12kg overall weight loss. She did not undertake any pharmacological treatment during the intervention period.

	Average Fasting Blood Glucose (mg/dl)	Average 2hr Post-Prandial Blood Glucose (mg/dl)
Week 1	222	310
Week 2	192	265
Week 3	170	194
Week 4	162	183
Week 5	171	190
Week 6	150	178
Week 7	156	173
Week 8	132	161
Week 9	138	164
Week 10	153	162
Week 11	149	169
Week 12	142	148
Week 13	127	148
Week 14	127	153
Week 15	133	142
Week 16	133	130
Week 17	136	138
Week 18	131	134
Week 19	130	132
Week 20	128	130
Week 21	127	123
Week 22	127	128
Week 23	119	134
Week 24	113	127





Dietary modification can play a chief role in the reversal of metabolic disorders like T2D.[4] If left untreated, metabolic disorders are associated with many life-threatening complications. [1] T2D was once thought to be a chronic progressive disease, but emerging research suggests it can be reversed by following a WFPBD combined with other strategies focused on improving insulin sensitivity.[10-13] In this case report, we observed a milestone transformation in metabolic health parameters of the patient. Pre-intervention, the patient had HbA1c of 12.50%, PPG of 342mg/dl, RBG of 298mg/dl, FBG of 250mg/dl, body weight of 86kg, BMI of 30.5, waist circumference of 43 inches. Post-intervention, she was able to achieve an HbA1c of 6.40%, average FBG of 113 mg/dl, average PPG of 127mg/dl, body weight of 74kg, BMI of 26.2, and waist circumference of 37 inches. Sustained Remission of T2D through customized nutritional intervention program shown in this case report shall shine a ray of light for many T2D patients.

CONCLUSION

The results suggest that a personalized dietary modification program combining WFPBD and IF can significantly improve metabolic health and potentially reverse T2D without the need for pharmacological treatment. This should be prospectively evaluated in a large multicenter randomized nutrition intervention trial.

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Cite this article as:
Kamalpreet Singh. Remission of Type-2 Diabetes on Plant Based Diet. AYUSHDHARA, 2024;11(2):71-74.
https://doi.org/10.47070/ayushdhara.v11i2.1502
Source of support: Nil, Conflict of interest: None Declared

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