

Dietary catering in management of obese patient with diabetes

Abstract

Dietary catering is a novel type of food service in which a patient is provided every day with meals prepared strictly according to dietary plan with calculated amount of energy and macronutrients. This type of dietary care is similar to health care centers with much lower cost, as it does not require any additional assisted care for the patients except dietary plan and food preparation. Every day delivery guarantees high quality of meals. This service seems to be convenient tool in management of obese and ill patients, however information on effectiveness of this service on health and weight of the patients is lacking. Effect of dietary catering on weight loss and blood glucose was tested on an elderly patient who had difficulties with preparation of meals according to nutritionist recommendations. Patient was a 71 year old male with diabetes (type 2) diagnosed 7 year earlier and treated with Novo Rapid insulin and metformin. At the start point of treatment patient had a BMI of 27kg/m² and waist circumference of 105.7 cm, blood glucose level was 170mg/dl and HBA_{1c} was 8.9%. 1500 kcal diet with 5 isocaloric meals containing 42g of carbohydrates each was applied for 8 weeks using diet catering regime. At the end point of treatment weight loss of 4.7kg was observed with waist circumference of 100.5cm and blood glucose level decreased by 50mg/dl with HBA_{1c} decrease of 1.2%. Both weight and HBA_{1c} levels were the lowest values noted in 5 years for this patient.

Keywords: weight management, diabetes, dietary catering, elderly

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Abbreviations: BMI, body mass index; HBA_{1c}, glycosylated hemoglobin A_{1c}; gI, glycaemic index

Introduction

The problem of obesity and type 2 diabetes is significantly correlated and shows an intense growth tendency in modern society.¹ These two medical conditions when appearing at once create a vicious circle in which means to achieving reduced blood glucose level is reducing the overweight but at the same time weight loss is affected by two high glucose levels.² One of the main problems reported by patients in control of weight and blood glucose level by the diet is their inability to prepare their meals strictly according to the diet plan prepared by the nutritionist. It is often observed that during hospital or sanatorium treatment patients present good results in weight and blood glucose reduction but once they use the same treatment at home with self prepared meals the diet is ineffective.³

Diet catering is a novel food service which is based on the idea of delivering meals prepared according to individual dietary plan on every day basis directly to patient's house. It is mostly used for people who want to achieve weight loss with minimal effort for meals preparation, especially those whose office work led to overweight and does not leave time for healthy cooking. Diet catering might be used for dietary treatment of obesity and many diseased simulating dietary cares in hospitals. It might be used by a wide range of patients with minimal cost and effect on lifestyle. However the effect of use of dietary catering in treatment of overweight and related diseases has not yet been described. The aim of this report is to present the case of an overweight patient with diabetes to whose treatment a dietary catering was applied.

Case presentation

Patient was a 71 years old male with BMI of 27kg/m² at the start

point of treatment and waist circumference of 105.7 cm. Patient was diagnosed with type 2 diabetes 7 years prior to treatment and during that time suffered significant difficulties with control of blood glucose level and weight management. Patient was treated with Novo Rapid insulin (34 units a day in three doses) and Insulated insulin (16 units a day in one dose) and metformin (1500mg a day in three doses). Patient was physically active before and during the treatment (30 minutes of bike ride a day, 210 minutes a week). Prior to treatment with diet catering patient was advised on his diet and was supposed to prepare meals based on the same dietary guidelines as were later used in dietary catering service for 6 months. Presented treatment and all taken measurements were a part standard medical procedure used by Dietetic Nutrition Center professionals and it followed Helsinki Declaration ethical guidelines. Patient signed agreement of his own volition to use medical and nutrition data for purpose of presented case report.

Dietary guidelines for patient consisted of calories intake of 1500kcal (lower than basal metabolic rate) with 5 meals 300kcal each. Meals contained 42g of total carbohydrates each and the whole diet 75g of proteins and 40g of fats. All meals were based on products with low or medium gI. All meals were precisely calculated by nutritionist and prepared strictly according to recipes by a professional catering service with highest quality standard. Sample menu is presented in Table 1. Patient was advised to consume meals in every 2.5 hours - first meal within 30 minutes from waking up and the last an hour before going to sleep. Treatment with dietary catering was applied for 8 weeks. Measurements were performed at 0, 4 and 8 weeks. Body parameters were analyzed using Jawon IOI 353 Body Fat Analyzed and biochemical data was collected by professional medical laboratory using standard procedures. glucose was analyzed using electrochemical assay with 2900 YSI analyzer and HBA_{1c} was analyzed using HPLC assay with Premier Hb9210 analyzer.

Table 1 Sample menu of diet

Breakfast	Snack I	Lunch	Snack II	Dinner
Plain yoghurt with multigrain cereals and fruits	Salad with smoked mackerel	Grilled chicken with red rice and vegetables	Millet with apples and walnuts	Rye pancake with spinach and dried tomatoes
Plain yoghurt: 200g Mixed cereals: oat, rye, amaranth, buckwheat, wheat germ: 30g Strawberries: 100g	Mackerel meat: 45g Mungo beans cooked: 100g Potatoes (young): 100g Mixed salads: 30g Tomato: 50g Onion: 20g Red peppers: 50g	Chicken breast: 120g Red rice (raw): 45g Vegetables: broccoli, cauliflower, zucchini, pumpkin: 150g Mixed grill spices	Millet (raw): 35g Apple: 150g Walnuts: 20g Cinnamon	Rye flour: 50g Egg white: 15g Spinach: 100g Dried tomato: 10g Olive oil: 5g garlic, basil
Carbohydrates 44g Proteins 16g Fats 8g	Salad with smoked mackerel	Carbohydrates 42g Proteins 30g Fats 3g	Carbohydrates 43g Proteins 7g Fats 13g	Carbohydrates 41g Proteins 12g Fats 7g

Data pertaining patients weight and blood sugar levels during treatment is presented in Table 2. It was observed that during 8 weeks of using diet catering patients weight was reduced by 4.7kg and BMI fell to 25.4kg/m² with waist circumference reduction of 5.2cm. There was also significant change in the blood glucose level which at the end of the treatment was at normal levels with slightly elevated HBA_{1c} which was by 1.2% lower than at the start point.

Table 2 Patient measurements during treatment

Parameter	0 weeks	4 weeks	8 weeks
Body Weight [kg]	81.3	79.1	76.6
BMI [kg/m ²]	27	26.4	25.4
Waist Circumference [cm]	105.7	102.9	100.5
Blood Glucose [mg/dl]	170.2	145	120.1
HBA _{1c} [%]	8.9	8.5	7.7

Discussion

Presented case suggests that diet catering might be a useful tool while dealing with elderly, overweight patients with diabetes. In 8 weeks of treatment a significant reduction of weight and blood glucose was observed and those parameters were also lower than noted by this patient in five years. Obtained results are similar to the effect noted when diabetic and overweight patients are treated in hospitals.^{3,4} It is important to remind patients and medical professionals that diet is the most effective treatment in type 2 diabetes and it is not replaced by including pharmacological treatment.^{4,5} Especially for elderly patients diet creates a significant challenge. It requires changes in both type of products and very strict regulations on amounts of foods in every meal. Elderly patients may also suffer problems associated with calculating meals by themselves using tables with carbohydrate content in foods especially in light of Otts et al.,⁶ findings that diabetes increases the risk of dementia. Using dietary catering in out-patient professional treatment of overweight diabetic patients may also reduce the global costs of diabetes treatment by influencing the most

demanding from patient's part of treatment at the same time lowering the cost of pharmacological treatment and frequency of consultations with the physician.⁷ With minimal influence on lifestyle of patients in comparison to hospital treatments this way of dealing with overweight and disease might be appealing for wide range of patients. Further studies on larger patient's population should be carried to provide information pertaining effectiveness of dietary catering in overweight and related disease treatment in order to formulate evidence based recommendations for patients.

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Conflict of interest

The author declares no conflict of interest.

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