A Case Study of Non-Pharmacologically Treated Type II Diabetes

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INTRODUCTION & BACKGROUND

- Risk of adverse health outcomes increases with insufficient sleep. Experts recommend adults obtain ***at least 7 hours of sleep per night*** (8).
- Studies show inadequate sleep is related to impaired weight loss (10), increased calorie intake, and increased snacking and carbohydrate (CHO) intake (11-13).
- Glucose metabolism has also been reported to be altered with sleep restriction with lower levels of glucose tolerance, insulin sensitivity, and other changes indicative of insulin resistance (14-17).
- Medical nutrition therapy (MNT) is a key component of self-management of diabetes (DM) and is encouraged for both pre-diabetic and diabetic individuals (2). Yet, no standardized diet plan for DM is in existence, instead individualization of a healthy dietary pattern that is both culturally and personally appropriate for patients is encouraged (1).

INITIAL CASE PRESENTATION

A 63-year old English-speaking male presents with increased hemoglobin (Hgb) A1c and a past medical history of diabetes (DMII), obesity, hypertension, depression, **obstructive sleep apnea**, history of tobacco use, and homelessness.

Initial Assessment:

- A1c in pre-diabetes range for past 3 years, now with A1c increased into diabetes diagnostic range (*Table 1*)
- Patient (pt) not treated pharmacologically for DMII, nor self-monitoring blood glucose (BG)
- Pt staying in shelter, awaiting new housing
- Weight gain of 9.5lbs over 10 days and net gain of 19lbs over 5 months
- Quit smoking 10 days prior, reports constant hunger, elevated taste perceptions, & consuming 8-10 meals/day
- Dietary recall limited in fruits/vegetables (f/v), high in excess kcals from sugary beverages, sweet snack foods, and frequent large portions.
- Pt uses gym facilities and walks daily

Table 1. Anthropometrics, A1c and Events

Date	Weight	A1c	Events
5/23/2013		6.4	
11/17/2014	236 lb	6.3	
1/7/2016	223 lb		
1/11/2016	228 lb		
2/22/2016	231 lb 8 oz	6.6	
3/21/2016	233 lb		Referral to Nutrition
3/31/2016	242 lb 8 oz	6.6	Initial Nutrition Assessment
5/19/2016	242 lb		Follow-up Nutrition Assessment

CLINICAL COURSE

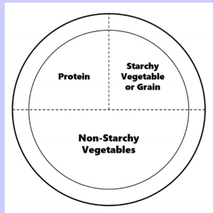
Nutrition Diagnoses:

1. Overweight/obesity r/t excess kcal intake as evidenced by pt report of 8-10 meals/day, dietary recall, weight gain of 9.5lbs over 10 days, net wt gain of 19lbs in 5 month period, & BMI of 32.8.
2. Excessive CHO kcal intake r/t increased appetite as evidenced by self-reported dietary recall (high intake of sugary beverages, sweet snack foods, 5 sandwiches/day), and two A1c lab values of 6.6%.
3. Food & nutrition knowledge deficit r/t lack of previous education on eating for DM and BG management as evidenced by pt's self-reported dietary recall and two A1c lab values of 6.6%.

Intervention:

- Explanation of CHOs and their impact on BG management
- Reviewed high dietary sources of CHO
- The Plate Method for DM (*Figure 1)* used to discuss portion size of foods at meals
- Reviewed meal timing and reducing number of meals
- Pt commended for daily physical activity and encouraged to continue current regimen

Figure 1. Diagram of The Plate Method



FOLLOW-UP ASSESSMENT

Monitoring/Evaluation:

- At follow-up (f/u), weight stabilized, down 0.5 lbs
- Continued intake of 8-10 meals/day, excessive CHO and poor f/v intake
- ***Pt reported waking every 2-4 hours at night, and eating before returning to bed***
- ***Pt not utilizing CPAP machine for OSA, referred to Sleep Clinic by PCP***

Nutrition Diagnosis: No change in the nutrition diagnosis at time of f/u

Secondary Intervention:

- Reviewed the Plate Method for DM , portion size, & foods high in CHO
- Recommendations were made based on patient's dietary recall
- F/u goal set to decrease meal frequency to 6 meals/day
- ***Pt encouraged to f/u with Sleep Clinic d/t poor quality sleep possibly impacting pt's metabolism and weight loss goals***

DISCUSSION

- Since pt not prescribed DM medications, self-management with diet and physical activity were appropriate interventions for BG control.
- Education on CHO sources and portion size are important nutrition goals to be addressed for DM II pts, while building a healthy individualized-diet and promoting weight loss by counseling pts to reduce kcal intake (1,7).
- The Plate Method was an appropriate tool for learning portion control and meal planning, consistent with ADA's recommendation of using simplistic tools for older DM II pts (1).
- Limiting and/or avoidance of sweet snack foods aligns with the ADA recommendation of prioritizing fruits, vegetables, and whole grains over foods with added sugar (1).

Sleep-related Outcomes:

- Lack CPAP machine usage suggestive of likely sleep insufficiency
- Research continues to grow and highlight a link between sleep & metabolism, yet to the author's knowledge no MNT guidelines on sleep exist for counseling obese or diabetic pts suggesting the evidence is not strong enough to make specific recommendations (9).
- Encouraging f/u with the Sleep Clinic was appropriate as increased sleep sufficiency may help pt achieve goal of decreasing meal frequency, and reduce daily kcal/CHO intake.

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