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. Studies show inadequate sleep is related to impaired weight loss (10), and that increased calorie intake, and increased snacking and carbohydrate (CHO) intake during restricted sleep are increased (11-13).
• Risk of adverse health outcomes increases with insufficient sleep. Experts recommend adults obtain at least 7 hours of sleep per night (8).
• Medical nutrition therapy (MNT) is a key component of self-management. Studies show inadequate sleep is related to impaired weight loss (10), increased calorie intake, and increased snacking and carbohydrate (CHO) intake (11-13).
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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

<table>
<thead>
<tr>
<th>Date</th>
<th>Weight</th>
<th>A1c</th>
<th>Events</th>
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</thead>
<tbody>
<tr>
<td>5/23/2013</td>
<td>236 lb</td>
<td>6.4</td>
<td></td>
</tr>
<tr>
<td>11/17/2016</td>
<td>235 lb</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>12/17/2016</td>
<td>228 lb</td>
<td>6.6</td>
<td></td>
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<tr>
<td>1/11/2016</td>
<td>229 lb</td>
<td>6.6</td>
<td>Initial Nutrition Assessment</td>
</tr>
<tr>
<td>2/22/2016</td>
<td>231 lb 8 oz</td>
<td>6.6</td>
<td></td>
</tr>
<tr>
<td>3/21/2016</td>
<td>237 lb</td>
<td>6.6</td>
<td>Referral to Nutrition</td>
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<tr>
<td>3/31/2016</td>
<td>242 lb 8 oz</td>
<td>6.6</td>
<td>Follow-up Nutrition Assessment</td>
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<tr>
<td>5/19/2016</td>
<td>242 lb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

CLINICAL COURSE

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: 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

FOLLOW-UP ASSESSMENT

Nutrition Diagnoses:
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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.

REFERENCES


Special Thanks to Sara Lynch, RD at Harborview Medical Center.