The DASH diet and dietary recommendations for patients post discharge

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Objectives

• Identify what the DASH diet is and its importance for patients post discharge.
  • DASH diet recommendations and research supporting use of DASH diet.
  • Ways to implement DASH diet into daily living
• Identify sodium recommendation for patients with HFpEF and HFrEF
  • Learn diet recommendations for improved outcomes with both HFrEF and HFpEF
• Identify recommendations for weight loss in obese patient population
  • Learn about the benefits of weight loss and diet recommendations in obese population in conjunction with cardiovascular diagnoses.
Diet and Cardiovascular Disease Risk

• Association Between Dietary Factors and Mortality for Heart Disease, Stroke, and Type 2 Diabetes in the United States
• Purpose: “to estimate the cardiometabolic mortality related to suboptimal intake of 10 dietary factors individually and jointly, among US adults in 2012; to assess diet-associated mortality by disease subtypes (heart disease and subtypes, stroke and subtypes, and type 2 diabetes) and population subgroups (age, sex, race, and education); and to evaluate trends between 2002 and 2012.”
• Specifically looking at 10 food groups or nutrients associated with cardiometabolic disease
  • Fruits, vegetables, nuts/seeds, whole grains, unprocessed red meats, processed meats, sugar-sweetened beverages, polyunsaturated fats, seafood/omega-3 fats, and sodium

Diet and Cardiovascular Disease Risk

• Study findings:
  • In 2012 there was a total of 702,308 cardiometabolic deaths
    • 506,100 due to heart disease
      • 371,166 due to CHD
      • 35,019 due to hypertensive heart disease
      • 99,815 due to other cardiovascular disease
  • When all 10 dietary factors were evaluated in combination they were associated with 318,656 estimated cardiometabolic deaths or nearly 45.4% of all US cardiometabolic deaths in 2012.
  • Individually, the largest numbers of estimated diet-related cardiometabolic deaths were related to
    • High sodium (9.5%)
    • Low nuts/seeds (8.5%)
    • High processed meats (8.2%)
    • Low seafood/omega-3 fats (7.8%)
    • Low vegetables (7.8%)
    • Low fruit (7.5%)
    • High sugar sweetened beverages (7.4%)

What is the DASH Diet Trial?

• Dietary Approach to Stop Hypertension
• A multicenter, randomized feeding study testing the effects of dietary patterns on blood pressure.
• As a trial of *dietary patterns* rather than individual nutrients, DASH tested the combined effects of nutrients that occur together in food.
• Study assigned to various diets, each with a sodium intake of approximately 3 grams
  • Control—typical to average Americans’ diets
  • “Fruit and vegetable diet”—specifically increasing fruits and vegetables
  • “The combination diet”—rich in fruits and vegetables, also including low fat dairy, reduced saturated fat, total fat and cholesterol

Results of the DASH Diet Trial

- Primary outcome was a change in diastolic blood pressure at rest.
- As a result, the “combination diet” reduced blood pressure more than both the “fruit and vegetable” group and control group.
- Reduced 24-hr ambulatory systolic blood pressure by 4.5 mmHg more, and diastolic blood pressure by 2.7 mmHg more than the control.
- In persons with BP of 160/80-95, the combination diet lowered systolic blood pressure by 5.5 mmHg and diastolic blood pressure by 3.0 mmHg more than control and to greater extent than a fruit and vegetable diet.
- The pattern of reductions in BP were similar in men, women and members or nonmembers of minority groups.

Results of the DASH Diet Trial

• “the DASH combination diet might be an effective nutritional approach to preventing hypertension. It is noteworthy that the blood-pressure reductions occurred in the setting of stable weight, a sodium intake of approximately 3 grams per day and consumption of two or fewer alcoholic drinks per day. Adoption of the DASH diet should complement, rather than supplant, what is currently recommended (weight control, reduced sodium chloride intake, and reduced alcohol consumption).”

• Researchers estimated that a population-wide reduction in systolic or diastolic blood pressure of the magnitude observed would reduce incidents of coronary heart disease by approximately 15% and stroke by approximately 27%

DASH Recommendations

- Emphasizes eating more:
  - fruits and vegetables
  - whole grains
  - fat-free or low fat dairy products
  - fish
  - poultry
  - beans
  - Nuts
  - vegetable oils

- Recommends limiting:
  - foods that are high in saturated fats
  - fatty meats
  - full-fat dairy products
  - tropical oils such as coconut
  - palm kernel and palm oils
  - trans fats
  - sugar-sweetened beverages
## 2000 Calorie Dash Eating Plan

<table>
<thead>
<tr>
<th>Food Group</th>
<th>Servings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains (at least ½ from whole grains)</td>
<td>6-8 oz</td>
</tr>
<tr>
<td>Meats, poultry, fish</td>
<td>6 or less</td>
</tr>
<tr>
<td>Vegetables</td>
<td>4-5</td>
</tr>
<tr>
<td>Fruit</td>
<td>4-5</td>
</tr>
<tr>
<td>Low-fat of fat-free diary</td>
<td>2-3</td>
</tr>
<tr>
<td>Fats and oils</td>
<td>2-3</td>
</tr>
<tr>
<td>Nuts, seeds, beans, peas</td>
<td>4-5 per week</td>
</tr>
<tr>
<td>Sweets</td>
<td>5 or less per week</td>
</tr>
<tr>
<td>Sodium</td>
<td>2300 mg/day</td>
</tr>
</tbody>
</table>
## DASH Eating Plan

<table>
<thead>
<tr>
<th>Food Group</th>
<th>1,200 Cal.</th>
<th>1,400 Cal.</th>
<th>1,600 Cal.</th>
<th>1,800 Cal.</th>
<th>2,000 Cal.</th>
<th>2,600 Cal.</th>
<th>3,100 Cal.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grains&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4–5</td>
<td>5–6</td>
<td>6</td>
<td>6</td>
<td>6–8</td>
<td>10–11</td>
<td>12–13</td>
</tr>
<tr>
<td>Vegetables</td>
<td>3–4</td>
<td>3–4</td>
<td>3–4</td>
<td>4–5</td>
<td>4–5</td>
<td>5–6</td>
<td>6</td>
</tr>
<tr>
<td>Fruits</td>
<td>3–4</td>
<td>4</td>
<td>4</td>
<td>4–5</td>
<td>4–5</td>
<td>5–6</td>
<td>6</td>
</tr>
<tr>
<td>Fat-free or low-fat dairy products&lt;sup&gt;b&lt;/sup&gt;</td>
<td>2–3</td>
<td>2–3</td>
<td>2–3</td>
<td>2–3</td>
<td>2–3</td>
<td>3</td>
<td>3–4</td>
</tr>
<tr>
<td>Lean meats, poultry, and fish</td>
<td>3 or less</td>
<td>3–4 or less</td>
<td>3–4 or less</td>
<td>6 or less</td>
<td>6 or less</td>
<td>6 or less</td>
<td>6–9</td>
</tr>
<tr>
<td>Nuts, seeds, and legumes</td>
<td>3 per week</td>
<td>3 per week</td>
<td>3–4 per week</td>
<td>4 per week</td>
<td>4–5 per week</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Fats and oils&lt;sup&gt;c&lt;/sup&gt;</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2–3</td>
<td>2–3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Sweets and added sugars</td>
<td>3 or less per week</td>
<td>3 or less per week</td>
<td>3 or less per week</td>
<td>5 or less per week</td>
<td>5 or less per week</td>
<td>≤2</td>
<td>≤2</td>
</tr>
<tr>
<td>Maximum sodium limit&lt;sup&gt;d&lt;/sup&gt;</td>
<td>2,300 mg/day</td>
<td>2,300 mg/day</td>
<td>2,300 mg/day</td>
<td>2,300 mg/day</td>
<td>2,300 mg/day</td>
<td>2,300 mg/day</td>
<td>2,300 mg/day</td>
</tr>
</tbody>
</table>
DASH-Sodium Trial

• Randomly assigned 412 participants to a typical American diet or the DASH diet. Followed for a month at 3,300 mg sodium per day and then 2,300 mg and 1,500 mg per day.
• Reducing daily sodium lowered blood pressure for participants but blood pressures were even lower on the DASH diet.
• DASH diet plus a sodium restriction can be a good tool for reducing or preventing hypertension.

Implementing DASH into Daily Living

- Strategies in **shopping**
  - Reading food labels—particularly convenience foods and condiments
    - Identifying sodium in foods and other words for salt
  - Choosing fresh poultry, fish and lean meats instead of cured foods
  - Choosing fresh or frozen versus canned
  - Avoiding foods with added salt
  - Avoiding instant or flavored rice/pastas or other boxed meals
  - Shopping the perimeter of the store for fresh ingredients
  - Looking for leaner cuts of meat, higher percentage fat-free
  - Meal planning and grocery lists
Implementing DASH into Daily Living

• Tips for **cooking**
  • Don’t add salt when cooking/boiling
  • Flavoring foods with salt-free seasoning blends
  • Rinsing canned foods
  • Using less table salt
  • Switch “salts” for “powders”
  • Add in more fruits and vegetables
    • Extra fruits or vegetables in sauces/dishes
  • Smaller portions of meats
  • Replacing higher fat food items for low-fat alternatives
Implementing DASH into Daily Living

- Tips when **eating out**
  - Avoiding menu items with high fat or high sodium ingredients
  - Ask how foods are prepared
  - Notice “key words” related to high sodium
    - Pickled, cured, smoked
  - Replacing high fat/sodium sides with fruits or vegetables
  - Looking at restaurants’ nutrition facts before going out
  - Take home half the portion or split meals
  - Fill up on a side salad or add extra vegetables to the meal
Sodium Recommendations for Patients with Heart Failure

• The original DASH study was done on a 3 gram sodium diet and a few articles suggest that intake of approximately 3 grams of sodium per day had the best outcomes—specifically reducing events or hospitalization.

• However the DASH-Sodium trial acknowledged the benefits of a reduced sodium intake of 2,300 and 1,500 mg.

• Research on the most appropriate sodium recommendation is mixed and evidence is limited.
Sodium Recommendations for Patients with Heart Failure

• Short-term effects of hypertonic saline solution in acute heart failure and long-term effects of a moderate sodium restriction in patients with compensated heart failure with New York Heart Association class III (Class C) (SMAC-HF Study)

• In patients with heart failure research reported that among subject receiving 1 liter of fluid per day those consuming 2800 mg sodium per day had significantly reduced re-admissions rate, length of stay and mortality rate than those consuming 1800 mg sodium per day.

• However among subjects receiving 2 liter of fluid per day subjects consuming 2800 mg of sodium per day or more had significantly higher mortality rates than subjects consuming 1900 mg sodium per day or less and no patient health was observed in the middle tertile of 200 mg to 2700 mg of sodium per day.

Sodium Recommendations for Patients with Heart Failure

• In heart failure patients receiving one liter of fluid per day, those consuming 2800 mg sodium per day had significant sustained reductions in body weight and improvements in cardiac output compared to those consuming 1800 mg sodium per day.

• Research reported that sodium intake of less than 3000 mg per day resulted in reduced symptom burden (shortness of breath, swelling of legs/feet, lack of energy, lack of appetite) when compared to sodium intake levels above 3000 mg per day but fluid intake was not reported.

• Further research needed

Sodium Recommendations for Patients with Heart Failure

• Comparing Sodium Intake Strategies in Heart Failure: Rationale and Design of The PROHIBIT Sodium (Prevent adverse Outcomes in Heart failure By limiting Sodium) Study
  • Patients who thought they were consuming approximately 2500 mg/day were actually taking in 2700-3900 mg/day.
  • Food diaries generally underestimated actual sodium intake
• The Academy of Nutrition and Dietetic’s Food and Nutrition Guide suggests, “limiting sodium to less than 2300 mg daily for those fourteen and older and to 1500 mg daily for further blood pressure reduction.”
  • More potassium rich foods because they blunt the effects of sodium on blood pressure


Recommendations for Weight Loss in Obese Patient Populations

- The DASH diet can support weight loss as it emphasizes more nutrient dense, lower calories foods as the base of the diet
- Portion control and decreasing intake to support weight loss
  - Approximately 500 calories less than BMR to promote 1-2 pounds of weight loss per week
- Encourage gradual weight loss so fluid status can still be assessed in patients with fluid retention
- Even moderate weight loss of 5-10 pounds may decrease risk for disease
References


