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Research Article

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Diet and Diverticulitis: Cause or Effect?

Jillian Floyd, DO and Bethany Malone, MD, FACS*

Department of Surgery, Texas Health Fort Worth Harris Methodist Hospital, USA.

***Corresponding Author**
Bethany Malone, Department of Surgery, Texas Health Fort Worth Harris Methodist Hospital, USA.

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Abstract

Diet plays an important role in diverticular disease. This article reviews the current research on diet in relation to diverticular disease, and the current recommendations from various medical entities. Methods: We performed a narrative review of the evidence for diet in patients with a history of diverticular disease. Findings: Diet advice should be individualized, and is dependent on underlying health conditions, the severity of the disease, and associated symptoms. Current recommendations suggest that patients who have recovered from diverticulitis should adopt a prudent dietary pattern high in fruits, vegetables, whole grains, legumes, poultry, and fish.

1. Introduction

Colonic diverticulosis is characterized by the presence of diverticula, or "outpouchings" of the mucosa and submucosa of the colon wall. These outpouchings typically occur at weak points in the colonic wall where blood vessels penetrate the circular muscle layer in order to provide blood supply to the mucosa [1]. While diverticula can develop anywhere in the colon, they are predominantly found in the sigmoid colon. The majority of diverticulosis is believed to be asymptomatic, and is relatively common in the industrialized world [2]. Up to 71% of individuals over the age of 80 have been found to have asymptomatic diverticulosis on routine screening colonoscopy [3]. Historically, diverticulosis was believed to stem from a low-fiber diet, with 10-25% of patients eventually progressing to acute diverticulitis [4].

The disease diverticulitis occurs when diverticula become microscopically perforated and can be divided into "complicated", and "uncomplicated" cases [5]. Uncomplicated diverticulitis was historically managed outpatient by placing the patient on a low residue diet avoiding fiber, nuts, seeds, popcorn, and raw vegetables until symptomatic improvement. Adhering to a low residue diet was believed to expedite the recovery process, reducing the risk of progression to complicated diverticulitis [6]. More recent evidence supports that dietary restriction is likely only warranted in uncomplicated cases in patients with an associated degree of colonic obstruction secondary to the inflammatory process [7]. Conversely, complicated diverticulitis, defined as diverticulitis with an associated obstruction, abscess, fistula, or macroscopic perforation frequently mandates hospitalization. These patients may benefit from nasogastric decompression and "nothing by mouth" status while they clinically stabilize, with gradual progression to a regular diet as tolerated [8,9].

When diverticulosis is associated with abscesses, colonic perforation, fistula formation, strictures, colitis, or other sequelae, it is referred to as "diverticular disease [10]. The complications with diverticular disease significantly contribute to healthcare burden and medical costs across the country. In the last 20 years, outpatient office visits and hospitalizations for diverticular disease have skyrocketed, with national expenditures reaching $2.7 billion. Of the patients hospitalized for diverticulitis, 22% required surgery, whether urgent or elective [11]. Given the prevalence of diverticular disease, and its widespread impact on the population, the goal of this article is to review the existing literature on dietary recommendations for diverticulitis in order to facilitate outpatient management of uncomplicated cases, remove undue restrictions from patients, and include failure to tolerate a regular diet as a symptom of lifestyle limiting disease.

2. Methods

A literature review was conducted in order to address the topic of dietary recommendations in relation to diverticulitis. PubMed (Medline), and the Virtual Health Library (VHL) were used to conduct searches utilizing the phrases, "diverticulitis and diet", and "dietary recommendations and diverticulitis" from 2014 to February 2024. We included systematic reviews, cohort studies, randomized controlled trials, and guidelines summarizing dietary recommendations in diverticulitis.

3. Results

There are currently no definitive dietary recommendations for individuals with diverticulitis. Many providers have traditionally recommended a low residue or low fiber diet to patients with diverticular disease and attributed flares to dietary intake of nuts, seeds, popcorn, or whole grains. More recent data does not support these previously implemented dietary restrictions as a means to prevent diverticulitis.

3.1. Fiber

Painter and Burkitt first hypothesized that diverticulosis stemmed from a fiber deficiency prevalent in modern Western society gained traction through the work of Painter and Burkitt. Painter hypothesized that a low fiber diet caused constipation; the high stool burden was believed to lead to increased colonic segmentation pressures, causing the mucosa to bulge at weaker areas of the colon wall [12,13]. While this was the prevalent thought process for nearly 50 years, it has more recently been found that this is likely not the primary process driving the development of diverticulum. A cohort study with 66,651 women and 45,906 men examine the relationship between types of dietary fiber, with outcomes based on hospitalizations due to diverticular disease. Each cohort was stratified into a quartile based on the amount of fiber from each category that the participant consumed in a 24-hour period, ranging from the lowest amount (Q1) to the highest amount (Q4) in grams.

Results were adjusted for age, smoking, BMI, education, alcohol consumption, physical activity, hypertension, diabetes mellitus, and steroid usage. It was found that women with the highest daily consumption of dietary fiber had a 25% decreased risk for hospitalization secondary to diverticular disease in comparison to those in the lowest quartile on multivariable analysis (RR of 0.75, 95% CI 0.57-0.99). For fiber obtained from fruits and vegetables, women who fell into the highest quartile of daily consumption had a 39% decreased risk of hospitalization compared with those in the lowest quartile (RR of 0.70, 95% CI 0.53-0.92). For men, those who fell in the highest overall daily consumption of fiber had a 39% decreased risk of hospitalization in comparison to those in the lowest quartile (RR 0.61, 95% CI 0.43-0.88). In regards to fruits and vegetables, men with the highest reported consumption had a 33% decreased risk of hospitalization in comparison to those in the lowest quartile (RR0.67, 95% CI 0.46-0.98). Both groups were also assessed for decreased risk in regards to fiber obtained from cereal consumption; however, neither gender had a statistically significant difference between the highest quartile and the lowest quartile in terms of later hospitalization (women 0.90, CI 0.68-1.19; men 0.76, CI 0.53-1.10) [14].

Further analyzing the relationship between fiber and the incidence of diverticulitis, Ma et al. followed a prospective cohort of 50,019 nurses who were initially disease free, documenting new incidences of diverticular disease. They found that women who consumed the most total dietary fiber had a reduced RR of 0.86 (95% CI, 0.78–0.95). Specifically, those with the highest intake of fiber from cereal had an RR of 0.90 (95% CI, 0.81–0.99), while fiber obtained from fruit, the RR was 0.83 (95% CI, 0.75–0.92). Higher levels of dietary fiber from vegetables had an RR of 0.92 (95% CI, 0.83–1.01). Moreover, women who ingested 25 grams or more per day of total fibers had an RR of 0.87 (95%CI, 0.79–0.96) in comparison to those consuming less than 18 grams per day. A key takeaway was that diets rich in whole fruits was linked to a decreased risk of developing diverticulitis, with an RR of 0.95 (95% CI; 0.92–0.98). The study further broke down the specific categories of fruits, and noted that apples or pears (RR 0.85; 95% CI, 0.76–0.96) and plums (RR 0.83; 95% CI, 0.69–0.99) were associated with a lower risk of developing diverticular disease. The study also noted that neither fruit juice consumption nor an increased intake of vegetables showed a significant connection with the risk of diverticulitis [15].

Although recent studies have suggested that a high-fiber diet does not protect against the development of diverticulosis, there is some evidence that a high-fiber diet may protect against diverticular disease [16]. In a study following 47,033 men and women in England and Scotland, it was found that individuals who followed a vegetarian diet had a lower risk for hospitalization, as well as morbidity, from diverticular disease [17]. There was also an inverse association for fiber intake; those with the highest intake of fiber were 41% less likely to have a complication from diverticular disease. These results were duplicated in a prospective study of US male health professionals, further reinforcing the protective effects of fiber [18].

3.2. Meat

Historical recommendations have centered around avoiding red meat. Cao et al. studied 46,461 participants, finding that patients with a substantial red meat intake had a multivariable RR of 1.58 (95% CI, 1.19–2.11) for developing diverticulitis. The risk escalated by 18% with each additional daily serving of red meat, stabilizing after six servings of red meat per week. Specifically, the risk was most pronounced with unprocessed red meat, where the adjusted RR was 1.51 (95% CI, 1.12–2.03). Processed red meat consumption had an RR of 1.03 (95% CI, 0.78–1.35). The study observed no significant correlation between the increased consumption of poultry or fish and the onset of diverticulitis [19].

3.3. Seeds, Nuts, Corn

For over half a century, individuals with diverticulosis were counseled to avoid foods like nuts, corn, and seeds with the belief that the rough particulate material could cause a blockage of a diverticulum, leading to an acute episode of diverticulitis. However, in a pivotal study conducted by Strate and colleagues, it was demonstrated that consumption of dietary nuts, corn, and seeds did not correlate with a heightened risk of developing acute diverticulitis or diverticular bleeding among a forward-looking cohort of male health professionals. In a prospective cohort study examining 801 new cases of diverticulitis, it was found that men who had higher consumption of nuts and popcorn had a decreased

rate of diverticulitis compared to those with lower consumption (hazard ratio [HR] = 0.80; 95% CI, 0.63–1.01; popcorn: HR = 0.72; 95% CI, 0.56–0.92) [20]. As a result, there appears to be no need for individuals with diverticulosis or a history of diverticulitis to eliminate these foods from their diet.

3.4. Dietary Patterns

In regards to specific dietary recommendations that patients can follow to reduce the risk of diverticular disease, a few different models have been studied. In one meta-analysis including 46,295 participants, the 'Western' and the 'Prudent' diet were examined. The Western diet is high in red and processed meats, refined grains, sugary desserts, French fries, and high-fat dairy products. Conversely, the Prudent diet is high fruits, vegetables, whole grains, poultry, and fish. Findings from the study demonstrated that men who predominantly followed the Western dietary pattern had a RR of 1.55 (95% CI, 1.20–1.99) for developing diverticulitis. Those who followed the Prudent pattern had a RR of 0.74 (95% CI, 0.60–0.91) in association with diverticular disease. The study also looked at the 2010 Alternate Healthy Eating Index (AHEI-2010), in regards to diverticular disease [21]. The AHEI-2010 is a tool to guide optimal dietary habits to help prevent disease; it assesses 10 dietary factors including intake of vegetables, fruits, nuts, red meat, trans fats, polyunsaturated fats, omega-3 fats, whole grains, sugary drinks, fruit juices, and alcohol. Individuals whose dietary habits closely followed the AHEI-2010 ideal had a RR of 0.67 (95% CI, 0.55–0.82) for the onset of diverticulitis [21].

• Diverticulitis is associated with multiple risk factors including diet, obesity, smoking, and genetics, among many others. • Patients with a history of diverticular disease should aim to consume a diet rich in fruits, vegetables, whole grains, legumes, poultry, and fish. They should minimize consumption of red and processed meats, refined grains, sweets, and high-fat dairy products when possible. • Nuts, seeds, and popcorn does not increase the risk of developing diverticular disease, and does not need to be avoided. • While patients should aim to have a healthy intake of fiber, there is no benefit to recommend fiber supplements.
Table: Dietary Recommendations for Patients with a History of Diverticular Disease

4. Discussion

Despite the extensive impact on the medical system, both the development of diverticula and the conversion from asymptomatic diverticulosis to symptomatic diverticulitis are poorly understood [22]. While there are no official guidelines to guide dietary recommendations supported by strong evidence, various associations have released best practice statements. In 2020, the American Society of Colon and Rectal Surgeons made a strong recommendation based on low-quality evidence to reduce meat intake [23]. Also, in 2020, The European Society of Coloproctology stated there was no evidence to support dietary restrictions during an episode of acute diverticulitis, and recommended a normal diet without [24]. With regard to prevention of recurrence, the American Gastroenterological Association recommend a fiber-rich diet, and do not recommend avoidance of nut or popcorn [25]. These recommendations were conditional, and were based on very low-quality evidence.

After experiencing an initial bout of diverticulitis, one in four patients subsequently develop recurrent disease [26]. Indications for surgery would include peritonitis, abscess, fistula, stricture, or lifestyle limiting disease, which is a highly individualized patient decision. While patients were previously advised to avoid many fiber rich foods, symptoms associated with intake of nuts, seeds, or corn would more accurately be categorized as lifestyle limiting disease, as refractory diverticulitis is more likely causing the intolerance of certain foods rather than these foods triggering a flare of diverticulitis. Current recommendations support counseling patients on the importance of a diet rich in fruits, vegetables, whole grains, legumes, poultry, and fish, while limiting the intake of red and processed meats, refined grains, sweetened foods, French fries, and high-fat dairy products.

Referencesss

1. Welch, C. E., Allen, A. W., & Donaldson, G. A. (1953). An appraisal of resection of the colon for diverticulitis of the sigmoid. *Annals of surgery, 138*(3), 332-343.
2. Everhart, J. E., & Ruhl, C. E. (2009). Burden of digestive diseases in the United States part II: lower gastrointestinal diseases. *Gastroenterology, 136*(3), 741-754.
3. Peery, A. F., Dellon, E. S., Lund, J., Crockett, S. D., McGowan, C. E., Bulsiewicz, W. J., ... & Shaheen, N. J. (2012). Burden of gastrointestinal disease in the United States: 2012 update. *Gastroenterology, 143*(5), 1179-1187.
4. Peery, A. F., & Sandler, R. S. (2013). Diverticular disease: reconsidering conventional wisdom. *Clinical Gastroenterology and Hepatology, 11*(12), 1532-1537.
5. Hoc, A. (1999). Diagnosis and management of diverticular disease of the colon in adults. *The American Journal of Gastroenterology, 94*(11).
6. Wilkins, T., Embry, K., & George, R. (2013). Diagnosis and management of acute diverticulitis. *American family physician, 87*(9), 612-620.
7. Dahl, C., Crichton, M., Jenkins, J., Nucera, R., Mahoney, S., Marx, W., & Marshall, S. (2018). Evidence for dietary fibre modification in the recovery and prevention of reoccurrence of acute, uncomplicated diverticulitis: a systematic literature review. *Nutrients, 10*(2), 137.
8. Shahedi, K., Fuller, G., Bolus, R., Cohen, E., Vu, M., Shah, R., ... & Spiegel, B. (2013). Long-term risk of acute diverticulitis

among patients with incidental diverticulosis found during colonoscopy. *Clinical gastroenterology and hepatology, 11*(12), 1609-1613.
9. Tursi, A., Elisei, W., Picchio, M., Giorgetti, G. M., & Brandimarte, G. (2015). Moderate to severe and prolonged left lower-abdominal pain is the best symptom characterizing symptomatic uncomplicated diverticular disease of the colon: a comparison with fecal calprotectin in clinical setting. *Journal of clinical gastroenterology, 49*(3), 218-221.
10. Schultz, J. K., Azhar, N., Binda, G. A., Barbara, G., Biondo, S., Boermeester, M. A., ... & Angenete, E. (2020). European Society of Coloproctology: guidelines for the management of diverticular disease of the colon. *Colorectal Disease, 22*, 5-28.
11. Strate, L. L., Liu, Y. L., Aldoori, W. H., Syngal, S., & Giovannucci, E. L. (2009). Obesity increases the risks of diverticulitis and diverticular bleeding. *Gastroenterology, 136*(1), 115-122.
12. Painter, N. S., & Burkitt, D. P. (1971). Diverticular disease of the colon: a deficiency disease of Western civilization. *British medical journal, 2*(5759), 450.
13. Painter, N. S., Truelove, S. C., Ardran, G. M., & Tuckey, M. (1965). Segmentation and the localization of intraluminal pressures in the human colon, with special reference to the pathogenesis of colonic diverticula. *Gastroenterology, 49*(2), 169-177.
14. Mahmood, M. W., Abraham-Nordling, M., Håkansson, N., Wolk, A., & Hjern, F. (2019). High intake of dietary fibre from fruit and vegetables reduces the risk of hospitalisation for diverticular disease. *European journal of nutrition, 58*, 2393-2400.
15. Ma, W., Nguyen, L. H., Song, M., Jovani, M., Liu, P. H., Cao, Y., ... & Chan, A. T. (2019). Intake of dietary fiber, fruits, and vegetables and risk of diverticulitis. *Official journal of the American College of Gastroenterology| ACG, 114*(9), 1531-1538.
16. Peery, A. F., Barrett, P. R., Park, D., Rogers, A. J., Galanko, J. A., Martin, C. F., & Sandler, R. S. (2012). A high-fiber diet does not protect against asymptomatic diverticulosis. *Gastroenterology, 142*(2), 266-272.
17. Crowe, F. L., Appleby, P. N., Allen, N. E., & Key, T. J. (2011). Diet and risk of diverticular disease in Oxford cohort of European Prospective Investigation into Cancer and Nutrition (EPIC): prospective study of British vegetarians and non-vegetarians. *Bmj*, 343.
18. Cao, Y., Strate, L. L., Keeley, B. R., Tam, I., Wu, K., Giovannucci, E. L., & Chan, A. T. (2018). Meat intake and risk of diverticulitis among men. *Gut, 67*(3), 466-472.
19. Aldoori, W. H., Giovannucci, E. L., Rockett, H. R., Sampson, L., Rimm, E. B., & Willett, W. C. (1998). A prospective study of dietary fiber types and symptomatic diverticular disease in men. *The Journal of nutrition, 128*(4), 714-719.
20. Strate, L. L., Liu, Y. L., Syngal, S., Aldoori, W. H., & Giovannucci, E. L. (2008). Nut, corn, and popcorn consumption and the incidence of diverticular disease. *Jama, 300*(8), 907-914.
21. Strate, L. L., Peery, A. F., & Neumann, I. (2015). American Gastroenterological Association Institute technical review on the management of acute diverticulitis. *Gastroenterology, 149*(7), 1950-1976.
22. Slack, W. W. (1962). The anatomy, pathology, and some clinical features of diverticulitis of the colon. *British Journal of Surgery, 50*(220), 185-190.
23. Hall, J., Hardiman, K., Lee, S., Lightner, A., Stocchi, L., Paquette, I. M., ... & Feingold, D. L. (2020). The American Society of Colon and Rectal Surgeons clinical practice guidelines for the treatment of left-sided colonic diverticulitis. *Diseases of the Colon & Rectum, 63*(6), 728-747.
24. Schultz, J. K., Azhar, N., Binda, G. A., Barbara, G., Biondo, S., Boermeester, M. A., ... & Angenete, E. (2020). European Society of Coloproctology: guidelines for the management of diverticular disease of the colon. *Colorectal Disease, 22,* 5-28.
25. Stollman, N., Smalley, W., Hirano, I., Adams, M. A., Dorn, S. D., Dudley-Brown, S. L., ... & Yang, Y. X. (2015). American Gastroenterological Association Institute guideline on the management of acute diverticulitis. *Gastroenterology, 149*(7), 1944-1949.
26. Salzman, H., & Lillie, D. (2005). Diverticular disease: diagnosis and treatment. *American family physician, 72*(7), 1229-1234.