

Colonic Diverticula and Diverticular Disease: 10 Facts Clinicians Should Know

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Diverticular disease accounts for substantial health care utilization and costs. Despite this public health burden, clinical practice has been largely based on poor-quality evidence. Fortunately, there is growing interest in this neglected disease. Based on recent work, clinicians should be familiar with the following 10 facts about diverticula and diverticular disease.

Diverticular disease accounts for substantial health care utilization and costs in the United States. There are more than 2,500,000 clinic visits, 330,000 emergency department visits, and 200,000 hospital admissions for diverticular disease each year in the United States [1]. Consequently, diverticular disease is associated with a significant economic burden in terms of both direct health care expenditures and indirect costs to society, which together are estimated at \$4 billion per year [2]. In the past 20 years, the incidence of diverticulitis has increased by 50% [3].

Colonic diverticula are the precursor to diverticular disease. Colonic diverticula form when colonic mucosa and submucosa herniate through the muscularis propria. Diverticular disease is a broad spectrum of conditions in which there are diverticular complications, which can include hemorrhage, inflammation, pericolic abscesses with or without perforation, strictures, fistulas, and even free rupture. The most common manifestation of diverticular disease is acute uncomplicated diverticulitis, which is characterized by inflammation of one or more colonic diverticula without abscess or gross perforation.

Despite the extensive public health burden of diverticular disease, many clinical reviews and guidelines have been based on dated hypotheses and low-quality evidence. Fortunately, there is resurgent interest in this long-neglected disease. Several high-quality studies have been published in the past decade, and this new work is changing clinical practice. Given these recent advances, the up-to-date clinician will want to be familiar with the following 10 facts about diverticula and diverticular disease.

1. The Low-Fiber Diet Hypothesis Was Unfounded

A low-fiber Western diet was long hypothesized to be the etiology of colonic diverticula [4]. The authors of this hypothesis argued that a low-fiber diet resulted in small-

caliber, hard stool. To move this material, it was thought that the colon had to generate excessively high pressures, which in turn caused mucosal herniation and formation of diverticula. Despite limited evidence, this hypothesis was widely accepted. More recently, 2 cross-sectional studies examined the relationship between dietary fiber intake and the risk of colonic diverticulosis among participants enrolled in colonoscopy-based studies that included a detailed assessment of diet [5, 6]. It was found that low fiber intake was not associated with an increased risk of diverticulosis.

2. Colonic Diverticula Are Common But Complications Are Not

Colonic diverticula are common in Americans. Almost one-third of adults in their 20s and 30s have colonic diverticula on colonoscopy [7]. The prevalence of diverticula increases with age. Indeed, 70% of adults over the age of 80 years in the United States will have colonic diverticula [7].

While many Americans have colonic diverticula, few develop diverticular disease. In a large retrospective cohort of patients with diverticulosis, only 1%–4% developed acute diverticulitis over 11 years of follow-up [8]. Notably, the risk of developing acute diverticulitis was higher in younger individuals compared with older individuals.

3. Treatment of Acute Uncomplicated Diverticulitis Is Controversial

The universal standard of care for acute uncomplicated diverticulitis had long been treatment with a course of antibiotics [9]. However, 2 randomized clinical trials of acute uncomplicated diverticulitis failed to show any benefit of antibiotic therapy [10, 11]. While a recent technical review [12] determined that these trials were low-quality studies, several national health systems in Europe (Denmark, Germany, Italy, and the Netherlands) have changed clinical practice and now recommend selectively withholding anti-

Electronically published May 6, 2016.

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N C Med J. 2016;77(3):220-222. ©2016 by the North Carolina Institute of Medicine and The Duke Endowment. All rights reserved. 0029-2559/2016/77316

biotics [13-16]. In contrast, a recent Cochrane review cautioned that further trials are needed before changing clinical guidelines [17].

Not surprisingly, there is genuine uncertainty in the United States as to whether antibiotics improve outcomes for patients with acute uncomplicated diverticulitis [18, 19]. Clinicians do not want to harm their patients by withholding treatment that has long been the standard of care, but they also want to avoid unhelpful treatments that may contribute to the growing problem of antibiotic resistance. Further research is needed to definitively establish whether patients with acute uncomplicated diverticulitis benefit from treatment with antibiotics. However, there is no question that antibiotics should continue to be used in patients with complicated diverticular disease, those with signs of infection, and those who are immunosuppressed or who have other significant comorbid diseases.

4. Post-Episode Colonoscopy Is Recommended to Rule Out Colorectal Cancer

Cross-sectional imaging is not perfectly specific for acute diverticulitis. Using data from a systematic review, 1 in 67 patients with imaging-confirmed acute diverticulitis were diagnosed with colorectal cancer on follow-up colonoscopy [12, 20]. Unless a colonoscopy has been recently performed, US guidelines recommend that a colonoscopy be performed 6-8 weeks after an episode of acute uncomplicated diverticulitis to rule out a misdiagnosed colorectal cancer [21].

5. Chronic Gastrointestinal Symptoms Are Common After the Acute Episode Has Resolved

While an acute episode of diverticulitis typically lasts only a few days, many patients report symptoms for months to years after the acute inflammation has resolved. In a study of acute uncomplicated diverticulitis confirmed by computed tomography scans, 45% of participants reported abdominal pain and 30% had altered bowel habits at 1-year follow-up [11]. Another study found a 5-fold increased risk of chronic gastrointestinal symptoms several years after an episode of acute diverticulitis [22]. Chronic abdominal pain and altered bowel habits after an episode of acute diverticulitis in the absence of overt inflammation has been termed post-diverticulitis irritable bowel syndrome [22]. Beyond gastrointestinal symptoms, the chronic sequela of acute diverticulitis include fear of having a recurrent episode while traveling, fear of needing a colectomy or colostomy, fear of misdiagnosis, and fear of a recurrent episode or a complication such as perforation [23].

6. There Is Some Risk of Recurrence After an Episode of Medically Managed Acute Diverticulitis

In the decade after a first occurrence of medically managed acute diverticulitis, 1 in 5 individuals will have a recurrence of acute diverticulitis [3, 12]. The risk of recurrence is higher (closer to 1 in 4) in adults under the age of 50 years

[3, 12]. After a first recurrence, the risk of further episodes is estimated at approximately 50% over a 5-10-year period [3]. A proportion of individuals will pursue elective colectomy after an episode of acute diverticulitis to reduce the risk of recurrence. The risk of recurrence is very low in individuals who had complicated diverticular disease that was managed surgically [4].

7. Complicated Diverticular Disease Most Commonly Occurs With the First Occurrence, Not With Recurrence

Abscesses, perforation, obstruction, fistulas, and strictures can complicate acute diverticulitis. These complications most commonly occur with the first occurrence of diverticular disease and not with recurrent episodes [3, 24]. Compared with those who have never had an episode of acute diverticulitis, individuals with a history of acute uncomplicated diverticulitis actually have a reduced risk of developing complicated diverticular disease [3]. This said, there is one exception to this rule: Recurrent episodes of acute diverticulitis are associated with an increased risk of fistulizing disease, a less common complication of diverticulitis [24].

8. The Decision to Pursue Elective Prophylactic Colon Surgery Should Be Considered on a Case-by-Case Basis

Gone are the hard and fast recommendations for prophylactic colon surgery resection after 2 episodes of acute diverticulitis (or 1 episode in young adults). With a better understanding of the natural history of acute diverticulitis, guidelines now recommend consideration of elective colon resection on a case-by-case basis after an individualized discussion of the potential risks and benefits.

9. Other Than Surgery, There Is Little Patients Can Do to Prevent a Recurrence

After an episode of acute diverticulitis, patients often seek recommendations on how they can modify their diet or lifestyle to reduce the risk of recurrent disease. Unfortunately, there are no studies of risk factors for recurrent episodes of diverticulitis.

Several risk factors for a first occurrence of acute diverticulitis have been identified. Regular use of nonsteroidal anti-inflammatory drugs increases the risk of a first occurrence of acute diverticulitis by 70% compared with those who do not regularly use these drugs [25]. Regular use of aspirin also increases this risk by 25% [25]. Smoking is a risk factor for diverticular disease in a dose-response relationship [26]. Obesity increases the risk of incident diverticulitis by 80% [27], while physical activity reduces the risk of diverticulitis by 25% [28]. A high-fiber diet is associated with reduced risk of hospital admission for diverticular disease [29]. Nuts, corn, and popcorn intake are not associated with an increased risk of diverticulitis [30].

Unfortunately, risk factors for recurrent diverticulitis may not be the same as risk factors associated with a first occurrence. Extrapolating from what we know about risk factors for a first occurrence, some guidelines suggest that patients avoid the use of nonsteroidal anti-inflammatory drugs and aspirin, consume a fiber-rich diet, and pursue vigorous physical activity [21]. While there have been several studies of medical therapy to reduce the risk of recurrence, trials of probiotics, rifaximin, and mesalamine did not reduce the risk of recurrent diverticulitis [21].

10. Genetic Factors Contribute to the Development of Diverticular Disease

A population-based study in Denmark found that diverticular disease aggregates in families [31]. Individuals who have a sibling with diverticular disease are 3 times more likely to develop diverticular disease compared with the general population. Genetic factors are estimated to contribute 53% of the susceptibility to diverticular disease. **NCMJ**

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Acknowledgments

Financial support. This research was supported in part by the National Center for Advancing Translational Sciences, National Institutes of Health, 1KL2TRO01109.

Potential conflicts of interest. A.F.P. has no relevant conflicts of interest.

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