

High-fibre Diet and Colonic Diverticulosis

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ABSTRACT

Dietary fibres is often recommended in the management of uncomplicated diverticulosis. despite a lack of high-quality level one clinical evidence. We reviewed the current status including the EPIC study and concluded that more evidence is needed prior to widespread use of dietary diet.

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Key words: Diverticular disease; Dietary fibre

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INTRODUCTION

Diverticular disease is an age-related condition, affecting 30% to 50% of the population over 60 years of age and more than 65% of population above age of 80 in the developed western world^[1]. Whilst epidemiological data in the developing world is lacking, many developed nations reported a significant rise in its incidence in the past decades^[2-5]. This is most possibly due to an increase in the older population.

The treatment of uncomplicated colonic diverticulosis as well as the prevention of diverticular complications often includes advice for a high fibre diet. Supporting evidence for this conventional

recommendation dates back to an old observational study by Burkitt who attributed a relatively higher prevalence of diverticular disease in the affluent Western population (compared to the poorer African one) to a lower fibre diet^[6]. It therefore seemed logical to offer a high fibre diet to patients with diverticular disease. This was even though the structural changes in the colonic wall associated with diverticulosis are not reversible. This doctrine has gained widespread popularity and has remained largely unchallenged over the years despite a lack of evidence. Many doctors and treatment guidelines have therefore recommended a high fibre diet for the treatment of uncomplicated diverticular disease. However, increased dietary fibre intake for uncomplicated diverticular disease to prevent its complications is of unknown effectiveness^[7].

There are two potential benefits of fibre being advocated in the management of uncomplicated diverticulosis. Firstly, the short-term alleviation of troublesome abdominal symptoms such as bloatedness, abdominal cramps and pain. Secondly, the long-term prevention of complications of diverticular disease which include recurrent diverticulitis, perforation, abscess, stricture and bleeding. However, this argument cannot be supported due to a lack of robust high-quality clinical evidence in the background of substantiated scientific knowledge about fibre.

CLINICAL STUDIES

The first double blind randomized controlled trial performed on symptomatic colonic diverticulosis had only 18 patients and reported a significantly greater symptomatic relief by those patients on a high fibre regimen than by those on the control group, despite a marked placebo effect at one month but fibre and placebo were tried for 3 months only^[8]. Due to the paucity of good quality randomized controlled trials of fibre and colonic diverticulosis, no meta-analysis is available but only two systematic reviews had been published^[9,10]. One showed that high-quality evidence for a high-fibre diet in diverticular disease remains lacking in the literature and recommendations for such are based on weak level 2 and 3 studies^[9]. In another, the preventive and therapeutic roles of fibre, rifaximin, probiotics, and mesalazine (used singly or in combination) are reviewed. In pooled studies, rifaximin used with fibre appeared to reduce the risk of acute diverticulitis in uncomplicated asymptomatic diverticular disease when compared to dietary fibre alone^[10]. In a crossover randomised controlled trial of fibre in diverticulosis,

fibre did not confer any benefit on pain scores, bowel symptoms like incomplete emptying, straining, stool consistency, flatus, belching, nausea, dyspepsia and abdominal distension. The authors concluded that the impression that fibre helps diverticular disease is simply due to western civilisation's obsession with the need for regular frequent defecation^[11].

THE PRESENT SCENARIO

Whilst there are observational case-controlled or cohort studies, these are statistically under-powered due to small patient numbers. The effect of a high-fibre diet on the pathogenesis and complication of diverticular disease is best studied in a well organised randomised controlled trial with long term follow-up and statistically powered sample size. However given the huge public sentiment for dietary fibre and the ready availability of vegetables, fruits, cereals and other fibre products, a large scale study will be very unlikely.

Most studies looking into the dietary aetiologies of disease suffer from two potential weaknesses: recall bias and length bias. The ready availability of vegetable foods and food derived from plant sources means that our dietary intake of fibre is substantial. Hence, subjects may over- or under-estimate easily the quantity of fibre they have consumed during re-collection. To demonstrate causation with specific disease, the risk factor in question ought to be preceding the event and occurs in a temporal relationship. A recent multi-centre UK cohort European Prospective Investigation into Cancer and Nutrition (EPIC) study appeared to have overcome some of these biases but needs a more careful look. In this long term follow-up study, subjects on vegetarian diets were shown to have a lower risk of admission to hospital or death from diverticular disease (being 4.4% in meat eaters compared to 3.0% in vegetarians)^[12]. It thus seemed that a habitual high fibre diet may confer some protective effect against complications associated with diverticular disease. However, there were a much higher proportion of older people above 50 years of age and of males in the non-vegetarian group compared to the vegetarian group and the authors failed to adequately compensate for these^[13]. Furthermore, most non-vegetarians would also be taking substantial amounts of dietary fibre in their diet as vegetarians would normally eat plenty of vegetables, fruits and such like as well.

It is also worth pointing out that the natural history of diverticular disease is such that only a small minority of patients will develop serious complications needing surgery. In a prospective single-centre observational study, at 5-year follow-up, only 1.7% of patients developed diverticulitis and even fewer required surgery^[14]. Any potential benefit, or otherwise, of fibre would therefore not make substantial clinical effect to the entire group and will be very difficult to substantiate indeed.

THE POSSIBLE HARMFUL EFFECTS OF FIBRE

However, fibre generates intestinal gas after digestion by the gut flora in the colon^[15-17]. It is well known therefore as a common cause of abdominal bloatedness, cramps and pain. Dietary fibre or roughage also bulks up stool with increased stool weight and volume^[18]. In addition, physiological studies on healthy volunteers have shown that fibre consumption results in retardation of gas transit due to a reduction in bolus propulsion towards the rectum^[15]. Such side effects of fibre, are therefore more likely to affect adversely the quality of life of patients than help them. Furthermore contrary to conventional wisdom, prolonged intraluminal gas production with raised colonic pressure due to increased dietary fibre may lead to an increased risk of the development for diverticulosis. The passage of bulkier stool through a

segment of diverticulosis may potentially traumatize the thinned-out colonic mucosa wall thereby risking perforation or bleeding.

CONCLUSION

Our current model of prescribing fibre for diverticular disease is based on concepts derived from inadequate observations. There is sparse clinical evidence to support the widespread use of dietary fibre to alleviate abdominal symptoms or to prevent complications in uncomplicated diverticulosis. We provide a perspective contrary to conventional wisdom, and believe that a high-fibre diet confers little or no benefit and may even exacerbate the abdominal symptoms in these patients and increase the risks of diverticulitis or complications. More evidence in the form of long-term interventional study coupled with a group on high fibre and a control group without any fibre at all is needed before dietary fibre can be recommended for the treatment of diverticular disease.

REFERENCES

- 1 Stollman N, Raskin JB. Diverticular disease of the colon. *Lancet* 2004; **363**: 631-639
- 2 Warner E, Crighton EJ, Moineddin R, Mamdani M, Upshur R. Fourteen-year study of hospital admissions for diverticular disease in Ontario. *Can J Gastroenterol* 2007; **21**: 97-99
- 3 Humes DJ, Solaymani-Dodaran M, Fleming KM, Simpson J, Spiller RC, West J. A population-based study of perforated diverticular disease incidence and associated mortality. *Gastroenterology* 2009; **136**: 1198-1205
- 4 Etzioni DA, Mack TM, Beart RW Jr, Kaiser AM. Diverticulitis in the United States: 1998-2005: changing patterns of disease and treatment. *Ann Surg* 2009; **249**: 210-217
- 5 Fong SS, Tan EY, Foo A, Sim R, Cheong DM. The changing trend of diverticular disease in a developing nation. *Colorectal Dis* 2011; **13**: 312-316
- 6 Painter NS, Burkitt DP. Diverticular disease of the colon: a deficiency disease of Western civilization. *Br Med J* 1971; **2**: 450-454
- 7 Simpson J, Spiller R. Colonic diverticular disease. *Clin Evid* 2002; **7**: 398-405
- 8 Brodribb AJ. Treatment of symptomatic diverticular disease with a high-fibre diet. *Lancet* 1977; **1**: 664-666
- 9 Maconi G, Barbara G, Bosetti C, Cuomo R, Annibale B. Treatment of diverticular disease of the colon and prevention of acute diverticulitis: a systematic review. *Dis Colon Rectum* 2011; **54**: 1326-1338
- 10 Ünlü C, Daniels L, Vrouenraets BC, Boermeester MA. A systematic review of high-fibre dietary therapy in diverticular disease. *Int J Colorectal Dis* 2012; **27**: 419-427
- 11 Ornstein MH, Littlewood ER, Baird IM, Fowler J, North WR, Cox AG. Are fibre supplements really necessary in diverticular disease of the colon? A controlled clinical trial. *Br Med J (Clin Res Ed)* 1981; **282**: 1353-1356
- 12 Crowe FL, Appleby PN, Allen NE, Key TJ. 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. *Br Med J* 2011; **343**: 4131-4146
- 13 Humes DJ, West J. Diet and risk of diverticular disease. *Br Med J* 2011; **343**: 4115-4116
- 14 Salem TA, Molloy RG, O'Dwyer PJ. Prospective, five-year follow-up study of patients with symptomatic uncomplicated diverticular disease. *Dis Colon Rectum* 2007; **50**: 1460-1464
- 15 Gonlachanvit S, Coleski R, Owyang C, Hasler W. Inhibitory actions of a high fibre diet on intestinal gas transit in healthy

volunteers. *Gut* 2004; **53**: 1577-1582

- 16 Marthinsen D, Fleming SE. Excretion of breath and flatus gases by humans consuming high-fiber diets. *J Nutr* 1982; **112**: 1133- 1143
- 17 Fleming SE, Marthinsen D, Kuhnlein H. Colonic function and fermentation in men consuming high fiber diets. *J Nutr* 1983; **113**: 2535- 2544
- 18 Schneeman BO. Dietary fiber and gastrointestinal function.

Nutr Rev 1987; **45**: 129- 132

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