

Colonic Diverticular Disease: An Uncommon Condition at University of Uyo Teaching Hospital

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ABSTRACT

Colonic diverticulosis refers to blow-outs or herniations of mucosa and submucosa which occur through the points of weakness of the colon. It occurs commonly in humans living in the western world. It is rare in rural Africa and Asia. We reviewed cases of colonic diverticulosis seen at general surgery unit of University of Uyo Teaching Hospital from July, 2008 to June, 2016. This was a hospital based retrospective study designed to analyze the presentation, management and outcome of adult patients found with colonic diverticulosis over the eight year period. The patients' records were retrieved and descriptive analysis of the data done. Ten patients with colonic diverticular disease presented during the eight-year period. The age range was 48 to 85 years, with a mean age of 66 years. There were 7 males and 3 females giving a male to female ratio of 2.3:1. The average body mass index (BMI) was 29.5kg/m². Eight patients (80%) had resided in North America and Europe between 1 to 20 years. Eight (80%) had tertiary education. The average frequency of bowel movement was once daily. Three patients (30%) were incidentally discovered during colonoscopy while 7 (70%) presented as emergencies with massive haematochezia. The average duration of hospital admission was 10 days. One patient died giving a mortality rate of 10%. The commonest mode of presentation of colonic diverticular disease in UUTH, Uyo is massive lower gastro-intestinal bleeding, which is life threatening. Further, extensive study is needed to confirm this. We advocate routine colonoscopy for patients over 50 years for early diagnosis and early treatment.

Keywords: Colon, diverticulosis, haematochezia

INTRODUCTION

Diverticular of the colon are acquired herniations of colonic mucosa, protruding through the circular muscles at the points where blood vessels penetrate the colonic wall^{1,2}. Diverticular disease includes a spectrum of conditions ranging from asymptomatic diverticular disease, to symptomatic uncomplicated diverticular disease and complicated diverticular disease, that includes acute and chronic diverticulitis^{1,2}. Colonic diverticulitis is inflammation of one or more diverticula^{1,2}. Also, the term colonic diverticulosis includes asymptomatic form of diverticular disease and clinically symptomatic diverticular disease, so they can be used interchangeably where appropriate. Diverticular disease of the colon is primarily a disease of humans living in industrialized countries. Sixty percent of humans living in industrialized countries will develop colonic diverticular disease, because of common consumption of low fibre diet, ageing and higher

social class³. The commonest site is the sigmoid colon, which is a common site for increased pressure in the gastrointestinal tract. The left side is more commonly affected in the United States while the right side is more commonly affected in Asia⁴. It is often diagnosed during routine colonoscopy or as an incidental finding during computerized tomographic (CT) scan⁵ or barium enema. It is rare before the age of 40 years, but more prone to complications when it occurs in the young³. At the age of 80 years, over 65% of humans have colonic diverticula in the western world³.

Diverticular disease of the colon, previously believed to be rare among Africans, is now an emerging disease entity in many areas of the African tropics⁵. The findings suggest that factors previously uncommon in the area may now be operating to cause the disease in the population, the highly processed food products of the supermarkets may be an important contributor to the development of this new disease entity⁵. Diverticulosis of the colon is rare in rural Asia and Africa due to consumption of high fibre diet, which encourages frequent bowel movement and discourages increased intra-luminal pressure of the colon³. The incidence of colonic diverticular

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disease increases with age and it is well documented. This results from the development of a structural change in the taenia coli, leading to progressive elastosis, which leads to shortening of the taenia coli and a subsequent change in the circular muscle layer⁶. This type of structural alteration takes time to develop and thus explains the time lag experienced between a change in diet and an altered incidence of the disease.

Most patients with diverticulosis will have clinically quiescent disease; approximately 80% to 85% are believed to remain asymptomatic⁷. Colonic diverticular disease can be asymptomatic, symptomatic or complicated. The complications include diverticulitis, pericolic abscess, peritonitis, intestinal obstruction, fistula formation and haemorrhage.

We review the cases of colonic diverticulosis that presented at University of Uyo Teaching Hospital in eight years from July, 2008 to June, 2016, the mode of presentation, management and outcome.

MATERIALS AND METHOD

This was a hospital based retrospective study. The study was designed to analyze the presentation, management and outcome of adult

patients found with colonic diverticulosis, symptomatic or asymptomatic, complicated or not, within an eight year period, from July, 2008 to June, 2016. Ward and clinic records were used to identify patients with the condition and subsequently folders from the medical records department of the hospital were retrieved. The folders of 10 consecutive patients were identified and retrieved. Clinical presentation, barium enema and colonoscopy findings and outcome of the management were studied. The data and other information extracted were documented on a structured proforma. The information include bio-data, mode of clinical presentation (emergency or from incidental finding during colonoscopy and or barium enema), complications, patient management, duration of admission, outcome of treatment and follow up plan. The information extracted was studied and analyzed by simple arithmetic.

RESULTS

A total number of 10 patients with colonic diverticulosis presented during this eight year period (July, 2008 to June, 2016). The age range was from 48 to 85 years, with a mean age of 66 years. There were 7 males and 3 females giving a male to female ratio of 2.3:1. All the women were multi-parous and post-menopausal. The body mass index (BMI) range was 23.10 kg/m² to 35.42 kg/m², giving the average BMI at 29.5 kg/m² (Table 1).

Table 1: Mode of the patients' presentation

PTNo.	Age	Sex	Occupation	BMI	years spent in first world	Presentation	Blood transfused (units)
1	50	F	Trading	28.30	Nil	Massive LGI Bleeding	6
2	85	F	Nursing (retired)	35.42	2	Massive LGI Bleeding	6
3	48	M	Civil Servant	29.30	1	Massive LGI Bleeding	5
4	75	M	Clergy (retired)	23.10	3	Massive LGI Bleeding	7
5	68	M	Accountant (retired)	27.39	2	Incidental (colonoscopy)	Nil
6	65	M	Civil Servant (retired)	28.37	Nil	Massive LGI Bleeding	8
7	68	M	Civil Servant (retired)	29.22	1	Massive LGI Bleeding	6
8	62	M	Engineering	30.10	4	Incidental (colonoscopy)	Nil
9	69	F	Nursing (retired)	34.20	20	Massive LGI Bleeding	6
10	70	M	Surveying (retired)	29.44	2	Incidental (colonoscopy)	Nil

The patients' staple foods were basically indigenous Nigerian foods of rice, beans, garri, fufu, plantain and yam with different Nigerian soups of melon, okra and different vegetables. The regularly consumed processed foods were pasta (spaghetti in particular) but cereals were infrequently consumed.

Eight out of ten (80%) had resided in advanced countries of Europe and North America from 1 year to 20 years (average of 5 years). Eight (80%) had tertiary education. All patients were married. Nine patients (90%) belonged to upper or upper middle social class. Three patients (30%) passed hard stool regularly. The average frequency of bowel movement was once daily.

Three patients (30%) were diagnosed incidentally during colonoscopy and presented in clinic (Fig.1), while seven patients (70%) presented as emergency with massive lower gastrointestinal bleeding. The average Packed Cell Volume (PCV) of the patients at presentation

was 20%. They all had repeated episodes of lower gastrointestinal bleeding prompting repeated blood transfusion of 5 to 8 units of whole blood per patient (with an average of 6 units of blood). Only 2 out of 7 patients with massive lower gastrointestinal bleeding went for colonoscopy to confirm the diagnosis of colonic diverticulosis, the remaining 5, had the diagnosis confirmed by barium enema, (Fig. 2). They were all HIV negative.

The duration of hospital stay was 5 to 22 days with an average of 10 days. Out of the 7 patients that presented with bleeding, 6 were successfully resuscitated (with crystalloids, blood transfusion, oxygen by face mask and antibiotics), while 1 patient died on the 5th day of admission at the Intensive Care Unit (ICU), giving a mortality rate of about 10%. All the surviving patients were placed on bland diet and stool softener and still undergoing follow up or at least followed up for 3 years without episodes of melena or frank haematochezia.



Fig. 1a

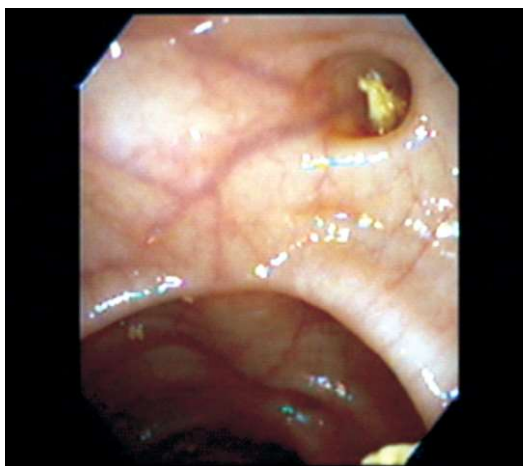


Fig. 1b
Fig. 1 Colonoscopic features of colonic diverticulosis. Note the Mouth of diverticula between the hypertrophied colonic walls. Also note the faecal particle in the diverticulum in Fig. 1b



Fig. 2 Barium filled out-pouches of colonic diverticulosis showing a concertina or saw-tooth appearance on barium enema.

DISCUSSION

Most diverticular diseases of the colon are asymptomatic making it difficult to accurately determine its prevalence rate⁸. The prevalence rates are reportedly high in Europe and North America with values ranging from 18.3% to 42.8%⁹⁻¹². Large African studies done in Kenya and Nigeria report a low prevalence rate of 1.9-9.4%¹³⁻¹⁶. An old study by Painter and Burkitt also showed a much lower prevalence of diverticulosis in an African population than in a western population which ingests a lower fiber diet¹.

It was believed that a low fibre diet reduces stool volume and colon diameter resulting in raised intraluminal pressure causing diverticular. This theory has been supported by subsequent human and animal studies¹⁸⁻²¹. However more recent studies showed either no correlation between diverticulosis and dietary fiber intake, or, surprisingly, positive correlation of the disease with fiber intake²²⁻²⁴. In our study, the diets of the patients were not significantly different from that of the general population, though they had a history of constipation. However, in 80% of the patients studied, there is a history of residence in North America or Europe, which affected their diet while residing there. The low fibre diet could have led to the development of colonic diverticulosis.

Another factor that may influence the low incidence of colonic diverticular disease in Africa is poor access to healthcare facilities and low life expectancy²⁵. Newer prospective data suggest a prevalence approaching that of western countries as Asian and African cities are urbanized²⁶. Studies in literature show colonic diverticular disease to be more common in the elderly, with reports of an incidence of up to 65% in those aged at least 85 years and 5% in those 40 years or younger^{27,28}. This is in keeping with our study where the mean age of the patients was 66 years and 80% of the patients seen were above 60 years. Generally, the younger patients tend to have a more severe form of the disease²⁹. Majority of the patients (70%) in our study were males. While this is in keeping with an earlier study by Forgey in 1966³⁰, more recent studies tend to show the disease to be of higher prevalence in elderly women, but of higher prevalence in men among patients below 40 years^{29,31,32}. In our study aging is a risk factor for diverticular disease, as in industrialized nations where it is a common aging change³³. This is because the underlying mechanism causing diverticulosis include weakening of the colonic wall and/or degenerative changes in the enteric nerves³³. These changes are gradual and manifest later in life. This results from the development of a structural change in the taenia coli, leading to progressive elastosis, which results in shortening of the taenia coli and a subsequent change in the circular muscle layer⁶. This type of structural alteration takes time to develop and thus explains the time lag experienced between a change in diet and an altered incidence of the disease.

Seventy percent (70%) of our patients that presented with diverticulosis were complicated by severe lower gastrointestinal haemorrhage while three (30%) were discovered incidentally during colonoscopy as part of routine medical checkup. This is in contrast to studies in the western world, which show that, relatively few diverticular disease patients are reportedly symptomatic and only about 25% of patients with acute diverticulitis become complicated^{8,32}. In addition, most of the patients in western world are screen detected⁹. More recent data suggest that up to 50% of individuals older than 60 years of age have colonic diverticular disease, with 10% to 25% developing complications³⁴. On the contrary, in our environment, the patients usually present when symptoms arise, hence our findings may not be fully representative of all the groups of patients with this disease since most of the people with colonic diverticular disease will be asymptomatic or have uncomplicated disease.

Barium enema may be more sensitive in diagnosing colonic diverticulosis than colonoscopy especially in the left colon; because colonoscopy can miss diverticular of the left colon identified by barium enema³⁴. Seven (70%) of our patients' colonic diverticular disease were diagnosed by barium enema, even though there was still need for colonoscopy to rule out colon cancer. It should be noted that there is no direct relationship between colon cancer and diverticular disease of the colon, as there is no increased risk of developing colon cancer in colonic diverticular disease³⁵, however colon cancer is an important differential diagnosis, especially in the elderly and they can also co-exist³⁶.

Body mass index (BMI) and obesity have a relationship with colonic diverticular disease, as obesity may predispose one to occurrence of the disease³⁵. Three (30%) of our patients were obese (BMI ≥ 30 kg/m²) while six (60%) were overweight (BMI between 25kg/m² and 30kg/m²), this is in keeping with the findings in advanced world of Europe and North America.³⁶ An Israeli colonoscopy-based retrospective case-control study involving 3,175 people found that obesity with a BMI > 30 was associated with a 1.4 times higher risk of diverticulosis.¹⁸ An American study followed 47,000 men over the age of 18,

and found that the risk of diverticulitis was 78% higher for men with a BMI > 30 compared to men with a BMI < 21, and the risk of diverticular hemorrhage was 3 times higher¹⁸. It is speculated that central adiposity is particularly relevant for the occurrence of diverticular disease due to the release of pro-inflammatory cytokines from the visceral fat¹⁸.

Social class may affect the occurrence of colonic diverticular disease. The condition is commoner in the affluent communities, as in advanced countries of North America and Western Europe^{3,37}. Unlike solitary diverticulum of the caecum which seem to have congenital origin and occur in younger patients and lacks association with social class, multiple colonic diverticulosis is essentially a disease of those above the age of 40 years and seem to be associated with higher social classes³⁸. In our study, most of our patients (80%) had resided in North America and Western Europe and 90% of them belonged to upper or middle social class. This finding is in agreement with a study in Thailand, where it was found that patients with multiple colonic diverticula, aged 40 years and above, seemed to be associated with higher social class³⁸.

CONCLUSION

The commonest mode of presentation of colonic diverticular disease in UUTH, Uyo is massive lower gastro-intestinal bleeding, which is life threatening. Further, extensive study is needed to confirm this. We advocate routine colonoscopy for patients over 50 years for early diagnosis and early treatment.

REFERENCES

1. Russell RCG, Williams NS, Bulstrode CJK. Bailey and Love's Short Practice of Surgery, 24th ed, Hodder Arnold, 2004;1160-63.
2. Badoe EA, Archampong EQ, daRocha-Afudu JT. Principles and Practice of Surgery including Pathology in the Tropics, 4th ed, Assemblies of God Lit Centre, 2010;695-7.
3. Floch MH, White JA. Management of diverticular disease is changing. *World J Gastroenterol*, 2006;12(20):3225-8.
4. Tursi A. "Diverticulosis today: unfashionable and still under-researched". *Therapeutic advances in gastroenterology*, 2016;(2):213-28.
5. Ihekweba FN. Diverticular disease of the colon in black Africa. *J R Coll Surg Edinb*, 1992;37(2):107-9.
6. Whiteway J, Morson BC. Pathology of the ageing diverticular disease. *Clinical Gastroenterology*, 1985;14(4):829-46.
7. Azzam N, Aljebreen AM, Alharbi O, Almadi MA. Prevalence and clinical features of colonic diverticulosis in a Middle Eastern population. *World J Gastrointest Endosc*, 2013;5(8): 391-7.
8. Shahedi K, Fuller G, Bolus R. Long-term risk of acute diverticulitis among patients with incidental diverticulosis found during colonoscopy. *Clin Gastroenterol Hepatol*, 2013;11:1609-13.
9. Peery AF, Barrett PR, Park D. A high-fiber diet does not protect against symptomatic diverticulosis. *Gastroenterology*, 2012;142:266-272.
10. Gear JS, Ware A, Fursdon P. Symptomless diverticular disease and intake of dietary fibre. *Lancet*, 1979;1:511-4.
11. Everhart JE, Ruhl CE. Burden of digestive diseases in the United States part II: lower gastrointestinal diseases. *Gastroenterology*, 2009;136:741-754.
12. Loffeld RJ, and Van der Putten AB. Diverticular disease of the colon and concomitant abnormalities in patients undergoing endoscopic evaluation of the large bowel. *Colorectal Dis*, 2002;4:189-192.
13. Calder JF. Diverticular disease of the colon in Africans. *Br Med J*, 1979;6176:1465-6.
14. Ogutu EO, Okoth FA, Lule GN. Colonoscopic findings in Kenyan African patients. *East Afr Med J*, 1998;75:540-3.
15. Ogunbiyi OA. Diverticular disease of the colon in Ibadan, Nigeria. *Afr J Med Med Sci*, 1989;18:241-4.
16. Alatise OI, Arigbabu AO, Agbakwuru EA. Spectrum of colonoscopy findings in Ile-Ife Nigeria. *Niger Postgrad Med J*, 2012;19:219-224.

17. Painter NS, Burkitt DP. Diverticular disease of the colon: a deficiency disease of western civilization. *Br Med J*, 1971;11:450-4.
18. Stephan KB. Risk Factors for diverticulosis, diverticulitis, diverticular perforation and bleeding: a plea for more subtle history taking. *Viszeralmedizin*, 2015;31(2):84-94.
19. Strate LL. Lifestyle factors and the course of diverticular disease. *Dig Dis*, 2012;30:35-45.
20. Carlson AJ, Hoelzel F. Relation of diet to diverticulosis of the colon in rats. *Gastroenterology*, 1949;12:108-115.
21. Fisher N, Berry CS, Fearn T. Cereal dietary fiber consumption and diverticular disease: a lifespan study in rats. *Am J Clin Nutr*, 1985;42:788-804.
22. Song JH, Kim YS, Lee JH. Clinical characteristics of colonic diverticulosis in Korea: a prospective study. *Korean J Intern Med*, 2010;25:140-6.
23. Peery AF, Barrett PR, Park D. A high fiber diet does not protect against asymptomatic diverticulosis. *Gastroenterology*, 2012;142:266-272.
24. Peery AF, Sandler RS, Ahnen DJ. Constipation and low-fiber diet are not associated with diverticulosis. *Clin Gastroenterol Hepatol*, 2013;11:1622-27.
25. Aboagye E, Agyemang O, Sidney K. Socioeconomic factors and health outcome metrics in Africa: cross-national comparisons from 1995-2011. *Popul Health Manag*, 2014;17:318-19.
26. Alatisie OI, Arigbabu AO, Lawa OO. Presentation, distribution, pattern, and management of diverticular disease in a Nigerian tertiary hospital. *Niger J Clin Pract*, 2013;16: 226-231.
27. Parks TG. Natural history of diverticular disease of the colon: a review of 521 cases. *Br Med J* 1969;4:639-642.
28. Painter NS, Burkitt DP. Diverticular disease of the colon, a 20th century problem. *Clin Gastroenterol*, 1975;4:3.
29. Schauer PR, Ramos P, Ghiatas AA. Virulent diverticular disease in young obese men. *Am J Surg*, 1992;164:443-6.
30. Forgey DE. The treatment of diverticulitis of the colon. *Am J Proctol*, 1966;17:278-287.
31. Warner E, Crichton EJ, Moineddin R. Fourteen-year study of hospital admissions for diverticular disease in Ontario. *Can J Gastroenterol*, 2007;21:97-9.
32. Kang JY, Hoare J, Tinto A. Diverticular disease of the colon on the rise: a study of hospital admission in England between 1989/1990 and 1999/2000. *Aliment Pharmacol Ther*, 2003;17:1189-95.
33. Spillerm RC. Changing views in diverticular disease: impact of aging, obesity, diet and microbiodata. *Neurogastroenterology & Motility*, 2015;23(7):305-312.
34. Weizman AV, Nguyen GC. Diverticular disease: epidemiology and management. *Can J Gastroenterol*. 2011;25(7):385-9.
35. Niikura R, Nagata N, Shimbo T, Akiyama J, Uemura N. Colonoscopy can miss diverticular of the left colon identified by barium enema. *World J Gastroenterol*. 2013;19(15):2362-67.
36. Gralund J, Svensson T, Granath F, Hjern F, Ekbom A, Bilomqvist P, Schmidt PT. Diverticular disease and the risk of colon cancer. *Aliment Pharmacol Ther*, 2011;34(6):675-681.
37. Lee SP, Ahn YW, Lee OY, Lee KN. The relationship between colonic diverticulosis and abdominal visceral and subcutaneous fat accumulation measured by abdominal CT scan. *The Turkish Journal of Gastroenterology*, 2014;25:192-7.
38. Vajrabukk T, Saksornchai K, Jimakorn P. Diverticular disease of the colon in a far eastern community. *Dis, Colon Rectum*, 1980;23(3):151-4.