

The Prevalence and Management Outcomes of Diverticular Disease in a Tertiary Facility in Ghana

Abstract

Background: Diverticular disease of the colon, previously believed to be rare among Africans, is now an emerging disease entity in many African countries. The increasing morbidity and varied presentations are associated with this. **Objectives:** To determine the prevalence of diverticular disease among patients who underwent lower gastrointestinal endoscopies over a 5-year period and evaluate the common presentations, interventions, and treatment outcomes at the Korle-Bu Teaching Hospital (KBTH), Ghana. **Materials and Methods:** This was a retrospective cross-sectional study of patients who underwent either a colonoscopy or proctosigmoidoscopy between January 2017 and December 2021, at the KBTH. The records of patients admitted for complications of diverticular disease over the same period were also reviewed. **Results:** A total of 4266 patients underwent lower gastrointestinal endoscopy over the study period. Out of this, 380 were diagnosed with diverticular disease giving a prevalence of 8.91%. This comprised 58.95% male and 41.05% female. Their mean age was 67.02 (standard deviation \pm 11.45). The age ranged from 26 to 95 years with a median of 67. Sixty-seven patients with 88 episodes of admission were managed for complications. The average age was 69.26 (SD \pm 13.28) and ranged from 40 to 98 years with an interquartile range of 20 years. Complications were predominantly bleeding diverticular disease (94.32%), whereas 5.6% presented with diverticulitis. Ninety percent were managed conservatively, and 10% had surgical intervention. **Conclusion:** This study concludes that the prevalence of diverticular disease among Ghanaians undergoing lower gastrointestinal endoscopy is still low and bleeding is the commonest indication for admission which is mostly managed conservatively.

Keywords: Colonic diverticulosis, colonoscopy, diverticular disease, diverticulitis, prevalence

Introduction

Diverticulosis, the presence of diverticula, is often detected incidentally in patients undergoing endoscopic or radiological examinations. Colonic diverticular disease develops when diverticulosis becomes symptomatic, commonly from diverticular bleeding and infection. Acute diverticulitis is infected symptomatic diverticulosis.

The “true” prevalence and incidence of diverticulosis and diverticular disease in the general population is unknown.^[1] This is because diverticulosis is usually asymptomatic and detected incidentally. Nevertheless, the incidence of diverticulosis is increasing worldwide, especially in developed countries, where it is estimated that about two-thirds of adult populations eventually develop diverticulosis.^[2] Age and geographic location associated with different

lifestyles including diet and physical activity, are the two most important determinants of diverticulosis prevalence.^[2]

In sub-Saharan Africa diverticular disease is regarded as a non-prevalent disease and hence not actively sought after, hence the exact burden of diverticular disease is unclear. Alatisé *et al.*^[3] identified 40 patients over a 5-year period in their study of diverticular disease in a tertiary hospital in Nigeria and Segal and Walker^[4] also detected 42 cases among black South Africans in a 3-year study.

In 1978, Archampong *et al.*^[5] reviewed the findings of 362 barium enema examinations in a teaching hospital in Ghana over a 3-year period for diverticular disease and found no cases of symptomless diverticulosis. However, there were 16 cases of radiologically proven diverticular disease. Baako *et al.*^[6] in 1997 also conducted a 3-year prospective study in one of four general

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surgical units in the same teaching hospital and found 37 over the period with rectal bleeding as the commonest presentation. These studies in Ghana suggested a two-fold increase in the prevalence of diverticular disease, from 5 per year to 12 per year over a period of two decades. In 2000, Dakubo *et al.*^[7] in determining the frequency of benign lesions and carcinomas in patients who underwent lower gastrointestinal endoscopy on account of bleeding per rectum found diverticular disease accounted for 4.5% of the 596 patients who were studied. In a bid to re-emphasise the role played by double contrast barium enema in the investigation of patients with colorectal symptoms, Mensah *et al.*^[8] also reviewed double contrast barium enemas in KBTH between 2003 and 2007, and diverticular disease was the commonest pathology diagnosed accounting for 23.91% of 362 patients.

With this trend, this study sought to determine the prevalence of diverticular disease in patients who underwent lower gastrointestinal endoscopy at the Korle-Bu Teaching Hospital (KBTH) in another snapshot period of 5 years (1 January 2017 to 30 December 2021). The study evaluated the common presentations of symptomatic diverticular disease among inpatients at the surgical units and assessed the types of therapeutic interventions offered to these patients and their outcomes.

Materials and Methods

This was a retrospective descriptive cross-sectional study on patients who underwent lower GIT endoscopy and/or were treated for diverticular disease in the General Surgical Units of the KBTH from January 2017 to December 2021. Thus, two sets of possibly overlapping populations were studied.

Ethical approval for the study was sought and granted from the Institutional Review Board of KBTH.

Sample size was determined using Cochran's formula. Data on all patients who underwent a colonoscopy or proctosigmoidoscopy at the endoscopy unit of the KBTH were included in this study. Data extracted included age, sex, procedure, indication, diagnosis, and specific locations of diverticular disease. We excluded data with incomplete records or poor documentation. Data, including age, presenting symptoms, intervention, and outcome of the intervention, of patients diagnosed and admitted with diverticular disease on the surgical wards were also included in the analysis. Irrespective of the number of admissions, all patients were counted once. Descriptive analysis of patients' characteristics was done. Data were analysed with Stata/MP version 13.1 (Stata Corp., College Station, Texas).

Results

Diverticular disease at endoscopy

A total of 4266 patients underwent lower GI endoscopy over this period. Out of this, 380 were diagnosed with

diverticular disease giving a prevalence rate of 8.91%, 97.37% (370/380) from colonoscopy and 2.63% (10/380) from proctosigmoidoscopy. An average of 86 cases per year was diagnosed over the period. Only patients with diverticulae were included in this analysis.

Baseline characteristics of patients with diverticulae are shown in Table 1.

The population studied was made up of 58.95% (224/380) males and 41.05% (156/380) females giving a male:female ratio of 1.4:1 [Table 1]. The mean age of patients diagnosed with diverticulae was 67.02 (SD \pm 11.45). The age ranged from 26 to 95 years with a median of 67 and an interquartile range of 16 (59-75 years).

The main indication for the endoscopy was bleeding per rectum, which accounted for 60% (228/380). Other indications included a change in bowel habit, 7.89% (30/380), a feeling of abdominal mass, 6.58% (25/380), and a complaint of abdominal pain 5.53% (21/380) [Table 2].

Thirty-nine percent (149/380) of patients had diverticulae at multiple sites of or involved the whole colon, 22.89% (87/380) were noted in the left colon and sigmoid, 12.11% (46/380) in the right colon and 4.47% (17/380) found in the transverse colon. In 21.32% (81/380) cases, the sites were not specified.

Table 1: Demographic characteristics of population studied

Outcome	Number of patients (n = 380)	Percentage (%)
Age group		
0–19	0	0
20–39	4	1.05
40–59	94	24.74
60–79	219	57.63
80–100	63	16.58
Gender		
Male	224	58.95
Female	156	41.05

Table 2: Clinical presentation of studied population

Presenting symptom	Number of patients (n = 380)	Percentage (%)
Rectal bleeding	228	60.00
Change in bowel habit	30	7.89
Colorectal mass	25	6.58
Abdominal pain	21	5.53
Left iliac fossa pain ^a	9	2.37
Right iliac fossa pain ^a	6	1.58
Other sites/generalised abdominal pain ^a	6	1.58
Perianal discharge	4	1.05
Anaemia of unknown origin	15	3.95
Others	57	15.00

^aThe sites of abdominal pain

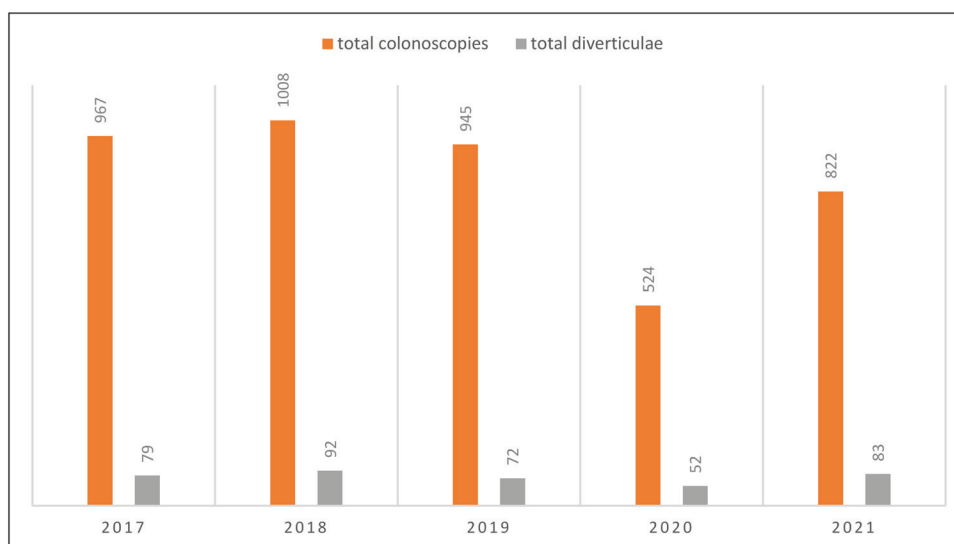


Figure 1: The trend of diverticular disease over the 5-year period

In more than half (196/380) of patients, diverticulæ were the only findings on endoscopy/colonoscopy. The rest of the patients, 48.42%, (184/380) had other findings such as haemorrhoids, polyps, and colorectal tumours at endoscopy.

Figure 1 shows the trend of total number of lower gastrointestinal endoscopies (proctosigmoidoscopies and colonoscopies) conducted over the period of the study and the number of diverticular diseases diagnosed over the 5-year period.

The orange bars show the total number of colonoscopies done per year and grey bars show the total number of diverticular diseases diagnosed each year.

Patients admitted with complications from diverticular disease

A total of 67 patients with 88 episodes of admission were managed in the surgical wards due to complications of diverticular disease. The average age for patients admitted with a complication from diverticular disease was 69.26 (SD \pm 13.28). Age ranged from 40 to 98 years with an interquartile range of 20 (59-75 years). The male: female ratio was 1.9:1.

Bleeding was the commonest complication necessitating admission (94.32% [83/88]). A few patients presented with acute diverticulitis (5.6% [5/88]). Females made up a higher proportion of individuals admitted on account of diverticulitis (3/5), and 23 presented with bleeding.

Thirteen percent (11/88) of the patients had in addition other surgical comorbidities including colorectal cancer (5/11), haemorrhoids (5/11), and metastatic prostate cancer (1/11).

Five patients were admitted multiple times with one patient, an 86-year-old male being admitted for a total of 19

admissions over the study period. His stay ranged between 1 and 7 days and was managed conservatively each time. He had no surgical comorbidities.

Most (89.77% [79/88]) the patients were conservatively managed with intravenous antibiotics, intravenous fluids and for those bleeding, haemotransfusion. The rest (9/88) had surgical interventions: 3.41% (3/88) underwent total colectomy with ileorectal pouch anastomosis, 2.27% (2/88) underwent hemicolectomy, and one a sigmoid colectomy. Haemorrhoidectomy was performed in three patients as internal haemorrhoids were noticed to be the major contributor to their bleeding.

The average length of stay was 5 days (SD \pm 3.84) for those who were admitted, with a maximum stay of 22 days.

Five patients (5.68%) died whilst on admission and rest 94.32% (83/88) discharged in good state. The mortalities were one out of the nine who were operated upon and four of those were managed conservatively. The mortality risk with surgical intervention was thus 11% and 5% for conservative management, a 2.19 relative risk of mortality after surgical intervention.

Discussion

From this study, there appears to be a rise in the number of cases of diverticulæ and diverticula disease diagnosed annually in the same centre where earlier studies previously found fewer numbers. The current rate of 8.91% was an increase from that reported over a decade ago, 4.5%, by Dakubo *et al.*^[7] An average of 76 per year was observed over this 5-year period, an increase from the previous 5 per year and 12 per year documented by Archampong *et al.*^[5] and Baako,^[6] respectively. It however remains lower than the prevalence of 42% recorded in the USA between 2013 and 2015,^[9] 49% in Germany,^[10] 23.9% in Japan, and 28.5% among Thai adults.^[11,12] These prevalence figures were

recorded from screening colonoscopies, which are almost not existent in the Ghanaian health system.

The increase in numbers was however affected by the onset of the COVID-19 pandemic with its associated lockdown. This period (2020 to the first half of 2021) saw a reduction in the number of proctosigmoidoscopies and colonoscopies conducted. Thus, there was a concomitant decrease in the number of diverticular diseases diagnosed. An increase was however noticed in the latter half of 2021. Overall, there was a decreased trend in diagnosis over the period of study but a summative increase in the number of cases diagnosed [Figure 1].

Diverticular disease was observed to be common among the elderly in the study population, with an average age of 67 years similar to other African countries and in the USA which also stood at 67.^[13] Though a disease of the elderly, the youngest patient reported in this study was 26 years, while that reported in Zambia was 42 and in Sudan, 17 years.^[13,14] The youngest patient ever documented with colonic diverticulosis was described by Ignacio *et al.*^[15] as a 9-year-old patient with William Syndrome. He presented with rectal bleeding from sigmoid diverticulitis.

The site of diverticulosis has been shown to differ according to country, region, and race. European and North American studies have identified the left colon as the commonest site (86%) in contrast to right-sided diverticulosis (75%–85%) seen in Japan and South Korea.^[9,16,17] Among Thai adults, diverticulosis was predominantly on the right but predominantly on the left among Sudanese.^[12,13] Like in Ghana, cases of diverticulosis studied in Nigeria were predominantly pan colonic disease.^[3]

The commonest presenting complaint among Thai adults was change in bowel habits.^[12] In Sudan, abdominal pain was the main presenting symptom amongst all patients studied—left iliac fossa pain in 58.6% patients, 21.1% in right iliac fossa and generalised abdominal pain in 20.2% and, 57.6% also complained of rectal bleeding.^[13] In this study, rectal bleeding was the commonest sole presentation (60%) or indication for colonoscopy. This was similar to that recorded by Alatisie *et al.*^[3] in Nigeria where rectal bleeding accounted for 70% of presentation followed by abdominal pain, 25%. Diverticular bleed is reported to account for about 30% of painless lower gastrointestinal bleeding.^[18] Most often, the bleeding site cannot be identified, and coexisting diverticula may then be falsely implicated.^[19]

Conservative management for diverticular disease includes haemotransfusion, intravenous fluids, restriction of oral intake and antibiotic therapy. This paradigm has however been challenged with the value of antibiotics being questioned.^[20] Two randomised clinical trials AVOD^[21,22] and DIABOLO^[23,24] comparing antibiotic and non-antibiotic treatment in immunocompetent and non-septic patients with uncomplicated diverticulitis, showed no difference in

time to recovery from the initial episode or in hospital stay. In complicated diverticulitis, little evidence exists about antibiotic treatment.^[19]

Elective surgery after one or more episodes of diverticulitis is said to improve quality of life. This is individualised and based on the frequency of recurrences, duration, and severity of symptoms after the attacks, though the presence or absence of comorbidities was also considered.^[19] This study recorded one postoperative mortality for the nine who had surgical management. This was an 82-year-old male with no surgical comorbidity, who underwent a left hemicolectomy.

Colonic diverticular haemorrhage, in more than 90% of cases, resolves spontaneously.^[25] However, a colonoscopy may be useful to identify the implicated diverticulum and provide therapy after initial resuscitation. It may additionally rule out other aetiologies of lower gastrointestinal bleeding, as was documented in our study with haemorrhoidal bleeding, and identify patients with a risk of rebleeding.^[26] In the rare case of intractable bleeding or unsuccessful identification of the bleeding vessel, laparotomy and total colectomy are recommended.^[25]

Conclusion

This study gives cognisance to the widely held view that the number of cases of diverticular disease is rising in Ghana in tandem with a growing elderly population, though the true prevalence may still be comparatively low. With a prevalence of 8.91% and a modernisation of the lifestyle of the populace, this is likely to increase within the decade. With bleeding per rectum as the commonest presentation, screening for stool occult blood will have to be made widely available in primary care centres as it is the cheapest screening tool. Facilities for colonoscopy and training programmes should also be prioritised within the healthcare system so that diverticular disease and other colonic pathologies may be diagnosed early.

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Conflicts of interest

There are no conflicts of interest.

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