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## Colon Diverticular Disease Seen at Nsambya Hospital

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### Abstract

**Background:** Colonic diverticular disease (CDD) is a condition in which bulging pouches develop in the colon. CDD is currently a global public health problem that has resulted into increased number of hospitalizations in the developed countries. Similar picture is being noticed in developing countries. This study was aimed at determining the prevalence of and factors associated with CDD among patients who were referred to St. Francis Nsambya hospital endoscopy unit for colonoscopy.

**Method:** This was a cross sectional study that utilized retrospective data collected from March 2015 to October 2020 and prospective data collected from November 2020 to March 2021. Records of adult patients who underwent colonoscopy examinations in the endoscopy unit of St. Francis hospital Nsambya (SFHN) were extracted and analyzed.

**Results:** Records of a sample of 230 patients who

underwent colonoscopy in the study period were reviewed. The prevalence of colonic diverticular disease (CCD) was 17.4%. Males accounted for 124 (53.9%) of the study participants. Sixty-five (28.3%) of the patients were aged between 51-60 while 60 (26.0%) were aged 71 years and above. Rectal bleeding in 88 (38.3%) patients was the commonest indication for referral for colonoscopy.

**Conclusion:** The prevalence of CDD among patients referred for colonoscopy at SFHN endoscopy unit was 17.4%. The anatomical distribution of diverticular disease was mainly to the left side of the colon. The most common symptom for which colonoscopy was requested was rectal bleeding.

**Recommendation:** Early screening with colonoscopy might be beneficial in detecting CDD among patients with varying abdominal symptoms.

**Keywords:** Colonoscopy, Colonic Diverticular Disease, Rectal Bleeding

### 1. Introduction

Colonic diverticular disease (CDD) has become a global public health problem that has resulted into increased number of hospitalizations in developed countries<sup>[1]</sup>. CDD is a condition which presents with sac-like protrusions of mucosa through the muscular colonic wall. It occurs in areas of relative colonic wall weakness passing through the circular muscle layer where blood vessels (vasa recta) penetrate to supply the mucosa<sup>[2]</sup>. Previous studies showed that CDD is evenly distributed among males and females and that its incidence increases with age occurring in less than 10% of those younger than 40 years compared with up to 70% of those 80 years and older<sup>[3]</sup>. The majority of patients with diverticular disease remain asymptomatic with 25% developing symptoms in their lifetime<sup>[4]</sup>. Available evidence has revealed that the higher incidence of CDD in developed nations is due to low fiber diet intake which leads to increased intraluminal pressure on the colonic wall<sup>[5]</sup>. Previous studies have further revealed that the anatomical distribution of CDD varies by geographic location in the developed countries and that in industrialized Western nations CDD is limited to sigmoid colon in 65%, is located in sigmoid plus other colonic diverticular in 25%, is pan colonic in 7% and is in segment proximal to the sigmoid colon in 4%<sup>[6, 7]</sup>. Studies found that in Asian population, CDD primarily involves the right colon with a prevalence varying between 13%-25%. However, this variation has not been documented within ethnically diverse African continent including Uganda.

Review of literature reveals that in general, colonic diverticular disease is rare in Africa with lower prevalence recorded among patients that underwent colonoscopy in most African countries; ranging from 2% to 13.5%<sup>[8, 9]</sup>. Higher rates have been

observed in sub-Saharan Africa (SSA) compared to other African countries from 6.6% in Kenya to 9.4% in Nigeria<sup>[5]</sup> Further still, a study in South Africa reported an increasing trend of CDD<sup>[10]</sup> and this was also evident in Uganda where during barium enema radiological examinations, 31 cases of CDD were recorded in a five-year retrospective study<sup>[11]</sup>. The increasing prevalence of CDD in Africa has been associated with increased adaptation of Western low fibre diets by Africans and has also been found to be associated with increased high health care cost<sup>[6]</sup> a factor which is likely to increase financial burden in an already over stretched African (including Uganda) health care system. While the disease is on an increase, not so much research has been conducted to determine factors associated with CDD in Africa in general and in Uganda in particular. Furthermore, there could be a higher prevalence of CDD in Uganda since the last study that document the prevalence of CDD was done in 2002<sup>[11]</sup> using barium enema, a method which is less commonly used in recent years. Therefore, this study aims to assess factors associated with CDD among patients undergoing colonoscopy examinations in Nsambya Hospital, Kampala Uganda.

We set out to investigate the prevalence sociodemographic characteristics (age, sex and geographic location), anatomical distribution of CDD among patients who underwent colonoscopy at SFHN endoscopy unit.

## 2. Methods

We designed cross sectional study with both Retrospective component from March 2015 to October 2020 and prospective component from November 2020 to March 2021.

Consecutive sampling method was used to recruit participants for the prospective arm of the study as they walked into endoscopy unit for colonoscopy evaluation as long as they fulfilled the inclusion criteria. While systematic random sampling method was used in the extraction of secondary data for the retrospective part. Data was extracted from hospital records of patients who underwent colonoscopy examinations in each year while employing the study eligibility criteria. We then obtained sampling frame by dividing the total number of patients who underwent colonoscopy between 2015 and 2021 by the calculated number of patients required to answer study objectives. Then using proportionating method, we obtained the number of patients to extract from hospital records in each year to come up with the total required sample size as calculated above.

The dependent variables were presence of colonic diverticular disease.

The independent variables were; Age, Gender, Sex, Geographical location, clinical presentation, recorded comorbidities, other associated pathologies in the colon, and anatomic distribution.

The data was abstracted from the records of patients who underwent colonoscopy examination at St Francis Hospital Nsambya (SFHN) from March 2015 to October 2020.

From November 2020 to March 2021 a validated questionnaire was used to collect similar data through interviews of patients scheduled for colonoscopy examination and through review of their clinical records.

## 3. Results

**Table 1:** Socio-demographics characteristics, clinical presentations and pathological presentations patients who underwent colonoscopy

Variable	n (frequency)	%
<b>Age</b>		
<51 years	49	21.3
51-60 years	65	28.3
61-70 years	56	24.4
>70 years	60	26.0
<b>Gender</b>		
Male	124	53.9
Female	106	46.1
<b>Geographic location in Uganda</b>		
Central Uganda	146	63.5
Western Uganda	46	20.0
Eastern Uganda	20	8.7
Northern Uganda	14	6.1
Southern Uganda	4	1.7
<b>Presenting symptoms</b>		
Rectal bleeding	88	38.3
Abdominal pain	67	29.1
Constipation	43	18.7
Diarrhea	32	13.9
<b>Other associated pathologies</b>		
None	27	11.7
Tumor	53	23.0
Colitis	72	31.3
Hemorrhoids	47	20.4
Polyps	31	13.5
<b>Colonoscopy findings</b>		
CDD present	40	17.4
CDD absent	190	82.6

Sixty-five (28.3%) of the patients were aged between 51-60 years while 60 (26.0%) were aged 71years and above. Males accounted for 124 (54%) with a Male: Female ratio of 1.2: 1. Rectal bleeding in 88 (38.3%) was the most common indication for referral for colonoscopy. Others included abdominal pain (29.1%), constipation (18.7%) and diarrhea (13.9%). Other pathologic lesions diagnosed included colitis (31.3%), tumors (23%), hemorrhoids (20.4%) and polyps in 13.5%) of patients.

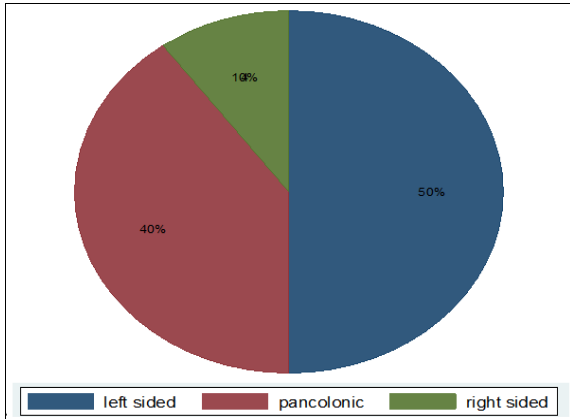
**Table 2:** Comparison of demographic characteristics between non-CDD and CDD patients

Variable	Non-CDD n (%)	CDD n (%)	p-value*
<b>Sex</b>			
Female	87(47.5%)	19(47.5)	0.844
Male	103(54.2)	21(52.5)	
<b>Age categories</b>			
<51 years	45(23.7)	4(10.0)	<b>0.023</b>
51-60 years	58(30.5)	7(17.5)	
61-70 years	42(22.1)	14(35.0)	
>70 years	45(23.7)	15(37.5)	
Total	190(82.6)	40(17.4)	

CDD was found in 40 of the 230 patients who had colonoscopy, giving the overall prevalence of 17.4% (table 1 above). The prevalence of CDD was higher among males (52.5%) than females (47.5%) however this comparison was not statistically significantly different  $p = 0.844$ . There was a

statistically significant difference when the prevalence of CDD was compared across different categories of age  $p = 0.023$ . The prevalence was highest among patients aged more than 70 years (37.5%) and lowest among those aged 50 years and below (10.0%).

**Anatomical distribution of colonic diverticular disease among study participants**



**Fig 1:** Anatomical distribution of colonic diverticular disease

Fig 1 above shows that 50 % (20) of the patients with confirmed diverticular disease on colonoscopy had diverticula located in the left side of the colon and only 10% had it in the right side.

**Factors associated with CDD**

At bivariate analysis factors with p-values  $\leq 0.2$  were considered to be significant and so were taken to multivariate analysis. Similarly, factors whose p-values were  $> 0.2$  but were found to be significantly associated with CDD in other studies were also considered for multivariate.

Patients who had haemorrhoids on colonoscopy were 24% less likely to have CDD compared to those with no associated pathologies, [crude PR- 0.24, 95% CI (0.13-0.43),  $p < 0.001$ ]. The prevalence of CDD among patients aged 61-70 years and  $> 70$  years was about 3 times statistically significantly higher compared to that among patients younger than 51 years, [crude PR- 3.06, 95% CI (1.08-8.71),  $p < 0.036$ ] and [crude PR- 3.06, 95% CI (1.08-8.65),  $p < 0.035$ ] for patients aged 61-70 years and  $> 70$  years respectively.

At multivariate variables with p-values  $< 0.005$  were considered to be significantly associated with CDD.

**Table 3:** Factors associated with CDD among patients who underwent colonoscopy

Variable	cPR	95%CI	p-value	aPR	95%CI	p-value
<b>Gender</b>						
Female	1					
Male	0.94	0.54-1.66	0.844			
<b>Age</b>						
<51 years	1					
51-60 years	1.32	0.41-4.27	0.644			
61-70 years	3.06	1.08-8.71	0.036			
>70 years	3.06	1.08-8.65	0.035			
<b>Presenting symptoms</b>						
Rectal bleeding	1					
abdominal pain	1.15	0.60-2.19	0.672			
Constipation	0.77	0.32-1.83	0.549			
Diarrhea	0.69	0.25-1.91	0.472			
<b>Other associated pathologies</b>						
None	1			1		
Tumor	0.02	0.003-0.163	<0.001	0.02	0.003-0.16	<0.001
Colitis	0.03	0.01-0.14	<0.001	0.03	0.01-0.14	<0.001
Hemorrhoids	0.24	0.13-0.43	<0.001	0.24	0.13-0.43	<0.001
Polyps	0.24	0.11-0.50	<0.001	0.24	0.11-0.50	<0.001

cPR – crude prevalence ratio responding to bivariate analysis and aPR – adjusted prevalence ratio responding to multivariate analysis

**4. Discussion**

This study has revealed that in keeping with Global picture, the prevalence of colonic diverticular disease has been observed to be rising globally as well as in Uganda with a 17.4% prevalence of CDD with 90% of them being aged 51years and above.

In our study, the most common indication for referral for colonoscopy was rectal bleeding (38.3%) followed by abdominal pain (29.1%) and diarrhea in 13.9%. This finding was similar to what was observed in Ghana and Nigeria [12] but different from what was observed in Sudan [5] and Israel [13] where the most common presenting symptoms were abdominal pain (a symptom not specific to CDD).

This observed difference in geographic distribution in Africa and Europe Vs Asian may be attributable to genetic influence. Diverticular disease is common in several genetic syndromes that are caused by mutations in genes that are

also implicated in the development of diverticular disease. For example, early-onset, extensive diverticulosis occurs in patients with inherited connective tissue disorders such as Marfan syndrome, Ehlers–Danlos syndrome, Coffin–Lowry syndrome and Williams–Beuren syndrome [14,15].

The prevalence of CDD was highest among patients aged above 70 years (at 37.5%) and lowest among those younger than 51 years. this finding was similar to those observed in several studies and reviews [12, 13] There was no difference between males and females. and this finding is in agreement with what was observed in other studies [6]The distribution of diverticular disease in this study was more in the left side of the colon (50%) followed by the entire colon (40%) and right colon last (10%). This observation had similar to other studies done in the region [5, 6].

The prevalence of CDD was higher in patients with colon neoplasms ( $p < 0.001$ ) as compared to those without colon

neoplasms This was observed in other studies as well [7] this is thought to be as a result of Low dietary fibers results in a prolonged fecal transit time, which allows more water absorption, leading to a smaller, more viscous fecal bulk increasing colonic exposure to carcinogenic products.

## 5. Conclusion

Prevalence of CDD was high in the study population (17.4 %), this prevalence was highest among patients older than 70 years. Colonic diverticular disease affected both sexes almost equally and it was most common in Central Uganda.

The anatomical distribution of diverticular disease was mainly to the left side of the colon. The most common presenting symptom was rectal bleeding.

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