COLONIC DIVERTICULOSIS IN ENUGU NIGERIA: THE PREVALENCE AND DISTRIBUTIONAL PATTERN

Author: Dr. Samuel O. Mgbor, M.B, BS, EDR; FA (Radiologie) FWACS
Department of Radiation Medicine, College of Medicine
University of Nigeria Teaching Hospital, Enugu Nigeria
Correspondence: Dr. Samuel O. Mgbor, Dept of Radiation Medicine, Box 2633, UNTH Enugu, Nigeria, E-mail: mgborsam@yahoo.com

ABSTRACT
A retrospective study on the pattern and prevalence of colonic diverticulosis of inhibitory in Enugu, Nigeria was carried out.

Radiographs and reports of past Barium Enema examinations done over a 10 year period were reviewed and analysed.

The prevalence of this disease entity in our community is 6.52% with no significant difference between both sexes. This figure is lower than those of Countries of industrialized West but higher than those of Middle East, India, Ghana. This is 3 times the figure recorded in Nigerians of another city, 15 to 30 years ago. The peak age incidence is the 40- 60 age groups.

A right sided predominance was observed. This is similar to the observation in Orientals but contrasts sharply with the findings in Caucasians. The disease coexists with colonic, malignancy in 25% of cases, thus buttressing previous suspicions that both diseases share common aetiological basis. No symptoms were found to be pathognomonic of the disease.

Colonic diverticulosis is no longer a rare disease in Nigerians as its incidence appears to be rising. The disease entity has no recognizable predilection for any sex. It occurs predominantly on the right, shows no pathognomonic symptom and may coexist with colonic malignancy in a quarter of the cases.

ABSTRAIT
Une étude rétrospective sur le modèle et la prédominance du diverticulosis du côlon d'inhibiteur dans Enugu, Le Nigéria a été effectué.

Des radiographies et les rapports des examens passés d'enema de baryum faits sur une période de 10 ans ont été passés en revue et analysés.

La prédominance de cette entité de la maladie dans notre communauté est 6.52% sans la différence significative entre les deux sexes. Ce chiffre est plus bas que ceux des pays de l'ouest industrialisé mais plus haut que ceux de l'Moyen-est, L'Inde, Le Ghana. C'est 3 fois où la figure a enregistré dans les nigériens d'une autre ville, il y a 15 à 30 ans. L'incidence maximale d'âge est les 40 - 60 catégories d'âge.

On a observé une bonne prédominance dégrossie. C'est semblable à l'observation dedans - Orientaux mais aux contrastes brusquement avec les résultats dans les Caucasiens. La maladie coexiste avec du côlon, malignité dans 25% de cas, de ce fait soupçons précédents étayants que les deux maladies partagent la base étiologique commune. Aucun symptôme n'est avéré pathognomonic de la maladie.
Le diverticulosis du côlon n'est plus une maladie rare dans les nigériens car son incidence semble monter. L'entité de la maladie n'a aucune prédilection reconnaissable pour n'importe quel sexe. Il se produit principalement du côté

droit, ne montre aucun symptôme pathognomonic et peut coexister avec la malignité du côlon dans un quart des caisses.

INTRODUCTION

Colonic Diverticulosis (CD) is defined as the presence of one or more diverticula in the colon. It is common in the Caucasians and rare in Asians and Africans.[1]

Compelling epidemiological evidence has been presented to show that diverticular disease of the colon is endemic where fibre in diet is low[2].

The incidence of this disease is known to vary with the state of the economic development of each country vis a viz the extent of westernization of the diet of its inhabitants.

It has also been postulated that this disease would not be expected to manifest in a population until the community in question has departed from its traditional diet for at least half a lifetime, that is, about forty years.[2,3.]

Only two previous studies on the prevalence of CD in Nigeria are available on search. Both studies were conducted 30 years and 15 years ago in Ibadan. S.W. Nigeria. The results confirmed the rarity of this disease entity. They showed a prevalence of 1.15% and 1.85% respectively.[4,5] The present retrospective study on the prevalence of diverticular disease as detected by Barium Enema Examinations (BEE), was undertaken in Enugu in the South East Region, an area with similar climatic, socioeconomic and dietary background. The aim of the study is to find out if any alteration in prevalence or trend has occurred in view of the rapid urbanization and industrialization and by extension dietary changes that have accompanied over four decades of Nigeria's political and economic independence.

MATERIALS AND METHODS

The study is based on the results of 407 consecutive Barium Enema Examinations performed on adult patients referred to the Radio- diagnostic Department of a private hospital, HANSA CLINICS Enugu metropolis in South Eastern Region of Nigeria over a ten-year period 1993 to 2003. The clinical data of these patients were retrieved and analysed.

The referrals came from private clinics and hospitals in Enugu and environs. Most of the patients were urbanized. Excluded from the analysis are the following categories of patients: Those under the age of 20 as this disease is known to be virtually non-existent in this age group; Those who have had previous bowel resections; those who had incomplete or inadequate examinations.

Based on these criteria, 24 cases were excluded, leaving a total of 383 for the study.

Each examination was conducted in double contrast technique. The request forms and films were reviewed by at least 2 radiologists, who were blinded to the identity of the patients and the clinical history. The site and size of the diverticula were recorded. The splenic flexure is taken as the dividing point between the right and left colons.[6]

Right-sided diverticulosis therefore referred to diverticular disease involving the appendix, caecum, ascending colon and transverse colon either singly or in combination.

The major indications for requesting the Barium Enema in all the patients with and without diverticulosis are shown in table 1.

RESULTS

Colonic Diverticulosis was found in 25 of 383 patients examined with Barium Enema giving a prevalence rate of 6.52%. Of this number, 17 were males and 8 females. Their ages ranged from 40 to 80 with a mean age of 61 years. Table 2

shows the age and sex distribution of CD while table 3 shows the summary of all the radiological findings and other relevant clinical data.

It shows that the disease was encountered nearly as frequently in males as in females. Frequency in males = 6.51%, Frequency in females =6.56%

In males, CD started to appear in the 4th decade. The prevalence rate rose rapidly and early, reaching a peak in the 6th decade and then diminishing in the 7th and 8th decades. In females, diverticula were not seen until the 5th decade. Its prevalence rose steeply in the 6th decade reaching a peak in the 7th and diminishing a little thereafter at the 8th decade.

DISCUSSION

Colonic Diverticula are small mucosal hernias which develop at points of weakness in the muscular wall of the colon. These points of weakness are usually synonymous with the points of entry of the intestinal arteries. Diverticula are situated between the Taenia Coli. Because they do not carry any mucosal coat, these outpouchings are usually considered to be false diverticula [7,8]

The etiopathogensis of these outpouchings has been the subject of much controversy. It is however sufficient to observe that the causes are at best multifactorial. Low fibre diet which gives rise to constipation, hypersegmentation and raised intraluminal pressure which in turn induces herniation of the mucosal coat at the weak points in the intestinal wall offers a good explanation for a certain form of colonic diverticulosis noted mainly in Caucasians namely the segmental long-necked diverticula of the sigmoid. The above sequence of events would not however entirely explain the etiogenesis of the solitary diverticula or the diffuse diverticula associated with old age. The former has been thought to be congenital or hereditary in origin while the latter are thought to result predominantly from a predisposing senile atrophy of the colonic musculature.[9]

Determining the prevalence of colonic diverticulosis in any population is considered difficult as mass surveys are hardly feasible or realizable. Diverticula are also visualized with some difficulty at colonoscopy and autopsy but are more clearly visible at Barium Enema examinations.[10] Using the results of consecutive Barium Enema Examinations done in hospitals or diagnostic centers, remains therefore the best option in estimating the prevalence of the disease to date.

The result from such a study is however not absolutely representative of the true picture as it is based on a highly selective population.

Two earlier reports based on B.E.E. done 15 years and 30 years ago in Ibadan, S.W. Nigeria had shown that colonic diverticulosis was rare in Nigerians. The prevalences then were 1.85% and 1.15% respectively.[4,5] The present study however shows that C.D is beginning to occur more frequently in our population. It was found in 6.5% of our adult patients who underwent Barium Enema Examination for various reasons. This figure is lower than those of most Western Countries but higher than those of the other African and Asian communities e.g Ghana and South African (Blacks). [11, 12, 13, 14] It is tempting to postulate that this change in trend is traceable to westernization of the Nigerian diet and reduction of its dietary fibre.

While there was no significant difference in prevalence between the male and female subjects examined, a striking discrepancy exists in the age of onset of the disease. Diverticular disease began to appear in males between the ages of 30 and 39 (4th decade) while it first

occurred in females in the 5th decade. Also while there were clusters of affected individuals, male and female alike in the 6th and 7th decades, fewer patients with diverticulosis were observed in the 8th and 9th decades. Bearing in mind the role low life expectancy could play in this assessment, one could be tempted to postulate that this distributional pattern, similar to what obtained in Hong Kong Chinese might mean our older citizens have not accepted western diet as readily as the younger generation did[10]

In this study, the right colon was found to be the site of predilection of all forms of diverticulosis including the solitary type which was exclusively observed in the caecum in four patients. This finding is similar to the distribution of diverticula in oriental populations but contrasts strongly with that of the western populations and even South African Blacks. Right Colonic Diverticulosis is common in the Japanese, Thais, Chinese in Hawaii and Chinese, Malays and Indians in Singapore, whereas the most common site of diverticula in western societies is the sigmoid colon[10,13]. The reason for this racial difference is still conjectural. It is however pertinent in this regard to mention that blacks have been found to have relatively much longer and wider sigmoid colons than Caucasians[15,16]. These factors while leading to a more even distribution of intraluminal pressure along the colon are believed to mitigate against hypersegmentation and by extension diverticular formation in the sigmoid colon.

The preponderance of right-sided diverticulosis in our population implies that clinicians working in this sub-region have to be extra-vigilant with patients who present with right iliac fossa pain or mass and a high index of suspicion for diverticulitis and its complications need be cultivated.

In consonance, with the findings of previous authors, no symptoms could be said to be pathognomonic of colonic diverticulosis per se. Although, abdominal pain, constipation and hematochezia were the commonest symptoms encountered amongst patients with this condition, these same complaints were equally present in those without. This finding buttresses the long held notion that uncomplicated diverticulosis is generally asymptomatic [18, 19]

Again this series showed a high degree of coexistence between radiologically proven cancer and diverticulosis coli. Although the study population is relatively small, this latter finding would seem to lend weight to earlier suggestions that both entities might have similar etiological basis. A larger detailed prospective study would definitely help clarify this relationship.

In conclusion, diverticulosis coli was viewed as a rare entity about 15 to 30 years ago in Nigeria. Now this disease has begun to emerge as a factor to be considered when confronted by patients with signs and symptoms of colonic disease. Its incidence has increased more than three fold that is from 1, 8% in 1989 to 6, 5% in 2003.

These findings are in agreement with the predictions of Burkitt and Painter that diverticulosis of colon would start to appear in developing countries of the world within half a lifetime if these populations constantly adopt a westernized dietary lifestyle [1,2,3].

Table 1
Clinical Indications for Barium Enema in Patients

Clinical Indication	**Patients with Diverticulosis**	**Patients without Diverticulosis**
Abdominal Pain	18	66
Constipation	7	57
Weight loss	2	11
Change in bowel habits	1	7
Melena, Frank blood in stool incl. Rectal Bleeding	5	70
Diarrhoea	6	20
Others	5	88
Hemorrhoids	-	15
Abdominal Mass	2	8
Total	**46**	**342**

Table 2
Age and Sex Distribution of Colonic Diverticula.

Men				**Women**					
Age Groups	**No. of pts Examined at B.E.E.**	**No. With Diverticula**	**%**	**No. of Pat. Examined**	**No. With Diverticula**	**%**	**No. of Patients Examined**	**No. With Diverticula**	**%**
20 - 29	19	-	-	12	-		31	-	0
30 - 39	48	2	4.2	22	-		70	2	2.8%
40 49	78	5	3.76	31	-		109	3	2.7%
50 59	42	6	14	18	2	11.1	60	8	13.3%
60 69	48	4	8.3	22	4	18.1	70	8	11.4%
70 79	17	2	11.7	14	2	14.2	31	4	7.8%
80 89	9	-	-	3	-		12		0
Total	**261**	**17**		**122**	**8**		**383**	**25**	

Table 3

				Types of Diverticla			Summary of Clinical Data and X-ray Findings at B.E.E.		
No.	**Patient**	**Sex**	**Age**	**Isolated Solitary**	**Segmental**	**Diffuse**	**Colonic Sites of Diverticula**	**Clinically Relevant Data**	**Coexistent Disease**
1	A.P	M	42		+		Rt. Colon	Abd pain and mass	Ca Colon Rt.
2	A.B	M	55		+		Rt. Colon	Abd pain, rectal bleeding & constipation	
3	A.M	M	41	+			Caecum	Hematochezia	
4	K.A	M	51			+	Generalised	Mass, abd discomfort	
5	O.J	F	68		+		Rt. Colon	Leftsided abd pain	
6	K.C	M	65			+	Desc/Asc/Sig	Constipation, abd discomfort	
7	O.A	M	62			+	Rt./Lt./Sigmoid	Chronic abd pain, irritable bowel	
8	I.N	F	60	+			Caecum	Abd pain + constipation	Ca Colon Rt
9	O.M	M	75			+	Desc/Lt./Sigmoid	Irritable bowel	
10	O.J	F	60			+	Desc/Lt/Rt	Constipation/pain	
11	M.L	M	75			+	Rt/Lt	Constipation	
12	R.N	F	60				Rt. Colon	Diarrhoea, abd pain	
13	O.N	F	80			+	Tran./Lt.	Melena	Uterine Prolapse
14	A.S	M	70				Left Colon	And pain/wt loss/constipation	Ca Rectum
15	A.T	M	60	+			Rt. Colon	Abd pain/discomfort	
16	O.H	M	60		+		Rt. Colon	Abd pain/discomfort	
17	A.U	M	60		+		Rt. Colon	Abdominal pain, diarrhea	
18	P.N	M	75			+	Lt/Trans	Abdominal pain/discomfort	
19	U.D	M	50			+	Sigmoid + Desc + Trans + Asc + Caecum	Left sided abdominal pain	
20	D.D	M	62			+	Left Colon + Sigmoid	Constipation	
21	I.O	M	40			+	Desc Colon + Sigmoid	Weight loss + Right Abdominal pain + Mass	Ca Colon Rt
22	O.P	M	51	+			Caecum	Lower gut bleeding	Ca Caecum
23	O.C	F	75			+	Sigmoid + Desc	Rectal bleeding	Hemiplegia
24	I.C	F	65		+		Trans + Asc	Colicky abd pain	
25	L.O	F	68		+		Sigmoid	Postprandial diarrhoea colicky Abdominal pain, post defecation relief	Ca Splenic Flexure

Table 3 shows a summary of all demographic, clinical and radiological data as well as sites and types of diverticula.

Table 4
Site Distribution of Colonic Diverticula

Single Segment	**Males**	**Females**	**Percentage of Tota l**
Caecum (all solitary)	4	-	4/25 = 16%
Ascending colon	5	1	6/25 = 24%
Descending colon	1		1/25 = 4%
Sigmoid colon	-	1	1/25 = 4%
Multiple Segments (Subsite Combination)			
Ascending + Descending + Sigmoid	1	1	2/25 = 8%
Ascending + Descending colon	1	1	2/25 = 8%
Transverse + Descending colon	1	1	2/25 = 8%
Sigmoid + Descending + colon	3	-	4/25 = 16%
Ascending + Caecum + Sigmoid +	2	1	2/25 = 8%
Descending + Transverse colon			
Ascending + Transverse colon	-	1	1/25 = 4%
Total number of cases	17	8	2/25 = 100%

Table 4 shows the site and subsite distribution of colonic diverticula, in all the patients with diverticulosis in single and multiple colonic segments.

The entire colon with the exception of the appendix and caecum was affected by diverticulosis. The ascending colon was the most frequently involved segment either singly or in combination with other segments (24%). This was followed by the left colon and then the sigmoid. When considered anatomically as earlier defined, the entire right colon comprising the caecum, ascending and transverse colon accounted for about 60% of the diverticula seen in the entire study.

The most prevalent subsite combination was (Ascending + Descending) colon combination. The caecum constituted the only site of solitary diverticulosis and this occurred in four male subjects.

As regards symptoms, pain was the commonest symptom being present in at least 18 patients. 7 patients complained of constipation, 6 of diarrhoea, 5 of rectal bleeding or melena, weight loss occurred in two, and a palpable abdominal mass was elicited in 3 patients.

Regarding concurrent disease, there was coexistence of diverticulosis and cancer of colon in 6 of patients in this series. Four of these were located in the right colon, 1 in the rectum and the other in the splenic flexure.

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