Colonic diverticular disease in Brunei Darussalam

E Ru WONG [1], Fazean IDRIS [1], Vui Heng CHONG [1, 2]
[1] Institute of Health Sciences, PAPRSB, Universiti Brunei Darussalam, and
[2] Division of Gastroenterology and Hepatology, Department of Medicine, RIPAS Hospital, Brunei Darussalam

ABSTRACT

Introduction: Diverticular disease is becoming more common in many developing countries as a result of change or modernisation of lifestyle and diet. Prevalence of diverticular disease is particularly common in the West and is reported to be increasing in the East. Right sided diverticular disease is more common in the East whereas in the West, left sided diverticular disease predominate. This study look at diverticular disease in Brunei Darussalam. **Materials and Methods**: All patients who had been undergone complete colonoscopy between 2011 and 2014 in a major tertiary referral centre were retrospectively identified through the Endoscopy Register and reviewed. Data on demography, indications for colonoscopy and findings of endoscopy were recorded. Records with complete data or incomplete colonoscopies were excluded. **Results**: The total number of colonoscopy done between the four years period was 2,763 (mean age 60.5 ± 13.1 years old, male 55%), of which diverticular disease was detected in 480 giving a prevalence of 17.4%. The most common indications among patients with diverticular disease were surveillance/screening for colorectal neoplasms or cancers, evaluation of bleeding per rectum and abdominal complain (no significant difference compared to patients without diverticular disease). The distributions of diverticular were proximal only in 37.1%, distal only in 32.7% and pan-diverticular in 26.1%. Specifically by anatomical locations, diverticular disease were found in the rectum 3.3%, sigmoid colon 33.9%, descending colon 37.3%, splenic flexure 4.7%, transverse colon 15.7%, hepatic flexure 7.8%, ascending colon 54.3% and ceacum 15.3%. Other common endoscopic findings were haemorrhoids, polyps and non-specific colitis. **Conclusion**: Diverticular disease is common in out setting with almost one in five patient undergoing colonoscopy affected. In our study, right sided disease predominate but left sided disease was also common. However, all parts of the colon were affected.

Key words: Colonoscopy, diverticular disease colonic diverticula, distributions

INTRODUCTION

Diverticula are structural abnormalities or alterations that classically form "pockets" or outpouching of the bowel wall. Diverticula is divided into true or false 'pseudo' diverticulum; true where the pouch wall consist of all layers of the wall such as Meckel's diverticulum, and false where on the pouch wall consist of the mucosa and submucosa. Colonic diverticula is classic example of false or pseudo-diverticulum. Colonic diverticula occur when mucosal herniate through the colonic wall at sites of vascular perforation. [1]

Among gastrointestinal disorders, diverticular disease is one of the most common disorders of the colon especially the elderly population. [1-3] It is most asymptomatic and most are detected incidentally during lower gastrointestinal investigations. [1] However between 10% and 25% will experience symp-

Correspondence author: Vui Heng CHONG
Division of Gastroenterology and Hepatology, Department of Medicine, RIPA Hospital, Bandar Seri Begawan BA 1710, Brunei Darussalam
Tel: +673 2242424 Ext 5233
E mail: chongvuih@yahoo.co.uk

toms. [1-3] Symptoms range from non specific gastrointestinal complaints such as non specific abdominal discomfort, bloating to more severe manifestations such as acute diverticulitis, haemorrhage and perforations. [1-3]

It is particularly common in the West but also becoming more common in the East. [4-9] The increase parallels the changes in the diet 'modernisation of diet' and life style. Lack of fibre intake is a risk factor. In the more developed countries in the East such as South Korea and Singapore, the prevalence rates are higher and with time have reported increase. [7-9] Age is the single most important factor and it is estimated that one third of people older than 45 years of age and in two thirds of those aged more than 85 years. [1]

In the East, DD is more common in the right side of colon but more common in the left side of colon in the West. [1-7] The incidence of colonic DD in Brunei Darussalam was reported to be 12.1%. [10] In the East, the most common manifestation of DD that requires admission is bleeding whereas in the West, acute diverticulitis is the most common manifestation. [1-3]

This retrospective study assesses the prevalence and the distributions of DD in Brunei Darussalam, a developing Southeast Asian nation where diet is largely traditional but slowly changing.

MATERIALS AND METHODS

Study Design, Population and Samples: This study was a retrospective study to look at all colonoscopies done in Brunei Darussalam (RIPAS Hospital) between 2011 and 2014. The target or reference population of this study was the patients who had been referred to the Endoscopy Unit, Division of Gastroenterology and Hepatology, Department of Medicine, RIPAS Hospital for colonoscopy between 2011 and 2014.

Data collection and Research Instruments: Data collected included the colonoscopy endoscripts, demographic data (age, gender and ethnic group), the sedations given and the indications of the colonoscopy and the endoscopic findings with specific reference (colorectal cancer and DD). The details on the locations of the colorectal tumour and DD (rectum, rectal/sigmoid junction, sigmoid, sigmoid/descending colon junction, descending colon, splenic flexure, transverse colon, hepatic flexure, ascending colon, ascending/ caecum junction or ceacum) has been assessed as well.

DD was further categorised into three categories; distal (splenic flexure and distal), proximal (proximal to splenic flexure) and pan -diverticular (proximal and distal). Furthermore, patients who underwent surveillance colonoscopy either had a past history of colorectal cancer or polyps. Patient who had surveillance consisted of patients who previously had CRC treated or had significant polyps that warranted surveillance. The information gathered were extracted using data collection form for analysis. No data that may identify the patient's identity were collected to maintain anonymity. Data collection form had been pretested for at least 10 case notes to ensure reliability and validity

Statistical Analysis: The collected data were recorded in computer (Microsoft Excel 2013) and analysed with the IBM Statistical Package for Social Sciences 21.0 (SPSS 21.0) for Windows. Statistical analyses were done where appropriate.

Ethical Considerations: The study was approved by the Medical and Health Research Ethics Committee (MHREC) of Ministry of Health in Brunei Darussalam, and Ethics Committee of PAPRSB Institute of Health Sciences (IHSREC). Data were only collected at office hours, with the supervision of the doctor at Department of Gastroenterology and Hepatol-

Table 1: Demographics of the patients with DD and without DD

		Mean age (SD)			*n* (%)		
		DD	**Non-DD**	***p* value**	**DD**	**Non-DD**	***p* value**
	Overall	60.5 (13.1)	50.8 (15.7)	<0.001	480 (17.4)	2,283 (82.6)	-
Gender	Male	60.7 (12.9)	51.2 (16.0)	0.004	262 (18.3)	1,165 (81.7)	0.119
	Female	60.4 (13.4)	50.4 (15.2)		213 (16.0)	1,115 (84.0)	
Ethnic group	Malay	59.8 (13.1)	49.3 (16.3)	0.015	282 (16.3)	1,445 (83.7)	0.120
	Chinese	61.9 (13.2)	53.8 (13.8)	*for trend*	125 (19.5)	516 (80.5)	*for trend*
	Indigenous	62.4 (13.0)	54.9 (16.6)		49 (20.9)	186 (19.1)	
	Others	56.3 (13.0)	50.2 (11.0)		24 (15.4)	132 (84.6)	

Table 2: Indications for colonoscopy (comparisons between patient with and without DD).

Indications	*n* (%)			
	Overall	**DD**	**Non-DD**	***p* value**
Bleeding per rectum (BPR)	603 (21.4)	118 (24.4)	485 (20.9)	0.119
Surveillance	545 (19.3)	98 (19.7)	447 (19.3)	0.717
Abdominal pain	503 (17.9)	78 (15.5)	425 (18.3)	0.199
Anaemia	290 (10.3)	57 (11.8)	266 (11.5)	0.924
Screening	267 (9.5)	44 (9.2)	223 (9.6)	0.656
GI Bleed	167 (5.9)	41 (8.2)	126 (5.4)	0.013
Constipation	193 (6.9)	27 (5.5)	166 (7.2)	0.187
Diarrhoea	104 (3.7)	20 (4.2)	84 (3.6)	0.627
Elevated CEA	67 (2.4)	12 (2.3)	55 (2.4)	0.921
Evaluation of suspected abdominal or rectal mass	76 (2.7)	11 (2.1)	65 (2.8)	0.487
Altered bowel habit	68 (2.4)	10 (2.1)	58 (2.5)	0.545
Weight loss	67 (2.4)	9 (1.9)	58 (2.5)	0.379
Suspected Piles/ Haemorrhoids	42 (1.5)	5 (1.1)	37 (1.6)	0.339
Others	31 (1.1)	5 (1.1)	26 (1.1)	0.844

ogy, Department of Medicine in RIPAS Hospital to prevent any infringement on patients' privacy. All the data collected were made anonymous and data collection were kept secured in a database.

RESULTS

The total colonoscopy done between 2011 and 2014 were 2,817. The mean age of patient under going colonoscopy was 60.5 ± 13.1 years old with slightly more male 55%. The demography of patients with and without DD is shown in Table 1. Overall, patients with DD were significant older than patients without DD.

The most common indications among patients with DD were surveillance/screening for colorectal neoplasms or cancers, evaluation of bleeding per rectum and abdominal complain (no significant difference compared to patients without DD). This is shown in Table 2.

DD was detected in 480 giving a prevalence of 17.3%. There were almost equal proportion of DD found in the parts of the colon, slightly more on the right side (isolated right sided disease). Isolated left sided disease was also common. The distribution by sides of the colon affected by DD is shown in Figure 1. All the parts of the colon were affected with the most commonly affected sites were the ascending colon followed by the sigmoid and descending colon. This is shown in Figure 2. were the ascending colon (54.9%) followed by the descending (37.3%) and sigmoid (33.9%) colon. This is shown in Figure 2.

Among the other common colonic findings encountered, with the exception of polyps (p<0.001), there were no significant

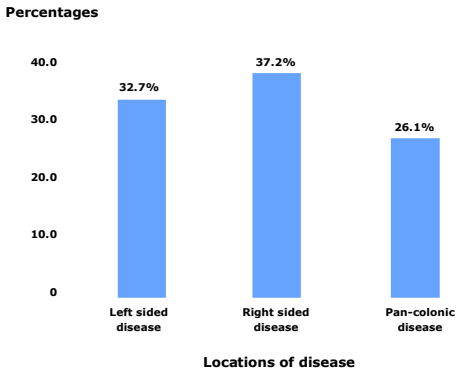

Fig. 1: Distribution of diverticular disease by sides of colon.

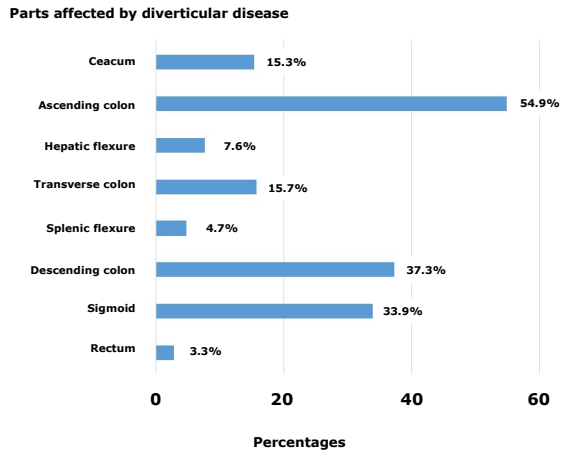

Fig. 2: Parts of colon affected by diverticular disease.

differences between those with or without DD. This is shown in Figure 3.

DISCUSSIONS

Our study showed that DD is common in our patients population who had colonoscopies during the study period with an overall prevalence of 17.3%. Compared to a previous study looking at patients undergoing colonoscopy between 2003 and 2007 which is almost a decade ago, showed that the prevalence has increased. In the previous study, the reported prevalence was 12.1%. Therefore, similar to what have been reported in other countries with increasing prevalence of DD. This is not unexpected due to ageing population and also the impact of lifestyle changes; a more sedentary lifestyle and modern diet rich in refined food products. Modern diet is generally low on fibre.

Overall, more male (18.3%) than female (16.0%) are to be diagnosed with DD in this study, but this was not statistically significant. This is not unexpected and comparable to what have been reported in the literature. The distribution of the ethnicities among those affected by DD showed that more Indigenous (20.9%) and Chinese (19.5%) were affected compared to the Malays (16.3%) and the expatriates or others group (15.4%). Studies from Malaysia and Singapore also showed that Chinese were affected more than Chinese. Fewer expatriates were affected mainly because this population group is generally younger than the others.

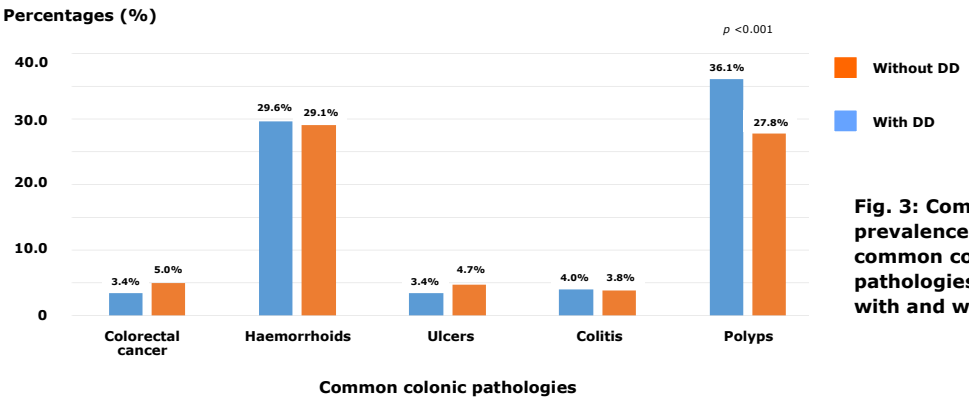

Fig. 3: Comparisons of the prevalence of other common colonic pathologies in patients with and without DD.

The mean age to be diagnosed with DD is approximately 60 years old; older among the indigenous and the Chinese with youngest among the expatriate or others group which was 56.7 years old. Those diagnosed with DD were approximately a decade older than those without DD. This is not unexpected considering that the prevalence of DD increases with age.

By sides of colon being affected, the most commonly affected side is the right colon with 63.3% of those diagnosed with DD; 37.2% with isolated right colon involvement and 26.1% with pan-DD. Contrary to previous belief, left sided disease is also common with 58.8% of all DD being left sided disease; isolated left sided DD in 32.7% and pan-DD involvement in 26.1%. By parts of the colon, the most common part of the colon to be affected is the ascending colon (54.9%), followed by the descending colon (37.3%) and the sigmoid colon (33.9%). In fact all parts of the colon are affected (Figure 3).

By specific parts of the colon in descending order is the ascending colon (54.9%), followed by descending colon (37.3%), sigmoid (33.9%), transverse colon (15.7%), ceacum (15.3%), hepatic flexure (7.6%), splenic flexure (4.7%) and the rectum (3.3%). Therefore, all parts of the colon can be affected. Our findings of the ascending, descending and sigmoid colons are consistent with what is reported in the literature. [5-10]

The common findings apart from DD include haemorrhoids 29.2%) and polyps (29.2%). Colorectal cancers were diagnosed in 4.7%, non-specific ulcers in 4.8% and colitis including non-specific colitis (3.8%). When the association between DD and other common colonoscopy findings was assessed, we found that presence of DD was significantly associated with presence of polyps, but not for the others.

In conclusion, out study showed that DD is not uncommon among our patient population who had colonoscopies. Importantly, compared to previous study, the prevalence has increased. Almost any parts of the colon can be affected with DD but the most commonly affected parts are the ascending, descending and sigmoid colons.

REFERENCES

1: Bhucket TP, Stollman NH. Diverticular disease of the colon. In: Feldman M, Friedman LS, Brandt LJ, eds. Sleisenger and Fordtran's gastrointestinal and liver disease: pathophysiology, diagnosis, management. Volume 2. 10th ed. Philadelphia: Elsevier, 2014:1-15.

2: Heise CP H. Epidemiology and pathogenesis of diverticular disease. J Gastrointest Surg 2008; 12:1309-11.

3: Stollman N, Raskin JB. Diverticular disease of the colon. Lancet. 2004; 363:631-9.

4: Everhart JE, Ruhl CE. Burden of digestive diseases in the United States part II: lower gastrointestinal diseases. Gastroenterology 2009; 136:741-54.

5: Tănase I, Păun S, Stoica B, et al. Epidemiology of diverticular disease -- systematic review of the literature. Chirurgia (Bucur). 2015; 110:9-14.

6: Paterson HM, Arnott ID, Nicholls RJ, et al. Diverticular disease in Scotland: 2000-2010. Colorectal Dis. 2015; 17:329-34.

7: Fong SS, Tan EY, Foo A, Sim R, Cheong DM. The changing trend of diverticular disease in a developing nation. Colorectal Dis. 2011; 13:312-6.

8: Kim KH, Kim YB, Kang JK, et al. A clinical study of diverticulosis of the colon. J Korea Med Ass. 1986; 29:63–8.

9: Song JH, Kim YS, Lee JH, et al. Clinical characteristics of colonic diverticulosis in Korea: a prospective study. Korean J Intern Med. 2010; 25:140–6.

10: Chong VH, Tan S, Jalihal A. Spectrum of Endoscopic findings among patients referred for colonoscopy in RIPAS Hospital. Brunei Int Med J. 2012; 8:27-33.

11: Lohsiriwat V, Suthikeeree W. Pattern and distribution of colonic diverticulosis: analysis of 2877 Barium enemas in Thailand. World J Gastroenterol 2013; 19:8709-13.

10: Rajendra S, Ho JJ. Colonic diverticular disease in a multiracial Asian patient population has an ethnic predilection. Eur J Gastroenterol Hepatol. 2005; 17:871-5.