Original Article

Ethnic Variation of Colonic Polyps

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Background: With more than 5,000 colonoscopies provided to patients from almost 200 countries annually, the data in Bumrungrad Colonoscopy Registry (BCR) is beneficial for comparative analysis across ethnic groups.

Objective: To describe the results of colonoscopy findings of colonic symptom-free patients from various ethnic groups.

Materials and Methods: Using the BCR dataset, a random sample of subjects underwent colonoscopy between 2007 and 2011 were reviewed. Patients aged at least 50 years without colonic symptoms or history of colonic diseases were included.

Results: Of the 26,508 subjects, 2,651 were randomly selected and 1,300 subjects met the inclusion criteria. Abnormal findings were identified in 878 cases (67.54%), of which 452 cases were found to have 940 polyps. Seven cancer lesions were found in six cases. Of the 452 patients, half had only one polyp (53.76%) and were Asian (54.65%), followed by Caucasian (26.99%), and Middle Eastern (15.71%). Ethnicity-specific polyp incidences were 36.26%, 38.05%, and 27.24%, respectively. Polyps of Caucasian subjects tended to be smaller (4.52 mm) and locate on the left side of colon (65.63%) more than that of the other ethnicities (44.44% to 60.53%). Most of the polyps (84.04%) were small (≤5 mm). Hyperplastic polyp, tubular adenoma (TA), and tubulovillous adenoma (TVA) were identified in 43.19%, 53.83%, and 2.34%, respectively. Pre-malignant (TA+TVA) polyps were found in 56.08%, 50.19%, and 64.23% of the polyps of Asian, Caucasian, and Middle Eastern patients, respectively. Interestingly, pre-malignant lesions were found in 52.91% of the small polyps.

Conclusion: Number, size, distribution, and pathological type of colonic polyps vary across ethnic groups. As more than half of small polyps were TA, polyps of all sizes should be removed when feasible.

Keywords: Colonoscopy, Polyps, Colon cancer, Epidemiology, Ethnicity

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Colorectal cancer is the third most commonly diagnosed cancer in male and the second in female with almost 13 million cases and 8 million deaths estimated to have occurred in 2008[1]. Given strong association with colorectal cancer, detection and removal of adenomatous polyps using screening colonoscopy and sigmoidoscopy have been recommended[2]. Colonoscopic polypectomy is found to prevent colorectal-cancer death[3].

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Incidence and mortality rates varied across economic and geographical areas[1,4]. With age-standardization, the colorectal cancer incidence in more developed areas was 37.6 per 100,000, compared with 12.1 per 100,000 in less developed ones[1]. Despite better healthcare system, the rate of death for colorectal cancer patients in developed countries is twice as high as those in less developed areas (age-standardized mortality 15.1 versus 6.9 per 100,000, respectively)[1].

Evidence on international variation of pathological types and anatomical distribution of colonic polyps is beneficial for early detection and management. As the largest private hospital for medical tourism in Asia, Bumrungrad International Hospital (BIH) has been providing more than 5,000 colonoscopies to patients from at least 190 countries annually. Therefore, it is

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a good setting for comparative analysis across ethnic groups.

Materials and Methods

The Bumrungrad Colonoscopy Registry (BCR) contains demographic, clinical, and pathological information of all patients that underwent colonoscopy since 2007. Patients aged at least 50 years without colonic symptoms or history of colonic diseases were included, according to the American College of Gastroenterology (ACG), the American Society of Gastrointestinal Endoscopy (ASGE), as well as the American Gastroenterology Association (AGA) recommendation[5-7].

All colonoscopy was done by approximately 20 qualified gastroenterologists using standardized protocol approved by the Digestive Disease Center, Bumrungrad International Hospital. A polyp was defined as small, if its size is less than 1 cm[5]. Patient ethnicity was classified into four categories, Asian, Caucasian, Middle Eastern, and others (African and Polynesians). Small and large polyps were defined as less than or equal to 5 millimetres and more than or equal to 10 millimetres, respectively.

Descriptive statistics including Student's t-test, Fisher's exact test, and Chi-square test were used as appropriate. Given 3.6% prevalence[8] in a finite population of 26,000, 1% precision, alpha 0.05, the minimum sample size required was estimated to be 1,269. As the present study was a pilot exploration, the dataset revealed an equal number of colonoscopies in patients with and without symptoms. Therefore, the authors anticipated that a 10% randomly selected records would give about 2,600 colonoscopies, half of which would be screening colonoscopy. Clinical information was manually extracted from written notes in medical records whereas laboratory findings were retrieved from the hospital information system when available.

The present study was approved by the Bumrungrad International Institutional Review Board (BI/IRB No.161-05-12). As part of the care process, no written informed consent was required.

Results

Of the 26,508 subjects who received colonoscopy between 2007 and 2011 in the BCR dataset, 2,651 were randomly selected and 1,300 subjects who met the inclusion criteria were included. The mean age was 60.13 years and 57.62% of the subjects were male (Table 1). Half of the subjects were Asian (52.62%), whereas Caucasian, Middle Eastern, and other ethnics were 24.46%, 19.77%, and 3.15%, respectively. Complication rates were 0.3%.

Table 1. Characteristics of the subjects (n =1,300)

Mean Age (years)	60.13
Age distribution	
50 to 59	54.92%
60 to 69	32.54%
70 to 79	10.46%
80 to 89	1.62%
90 and above	0.46%
Sex: male	57.62%
Ethnic distribution, n (%)	
Asian	684 (52.62)
Caucasian	318 (24.46)
Middle Eastern	257 (19.77)
Others	41 (3.15)
Abnormal findings (cases), n (%)	878 (67.54)
Polyp	452
Diverticulosis	283
Ulcer	40
Inflammation	97
Cancer	6
Total number of polyps	940
Number of polyps, Mean±SD	2.08±0.16

SD=standard deviation

Abnormal colonoscopic findings were identified in 878 cases (67.54%), of which 452 cases were found to have 940 polyps (mean 2.08; 95% CI 1.91 to 2.24). Diverticulosis, colonic ulcer, and colonic inflammation were found in 283, 40, and 97 cases, respectively, whereas seven cancer lesions were found in six cases.

Half of the cases (243/452; 53.76%) had only one polyp. Most polyps (790/940; 84.04%) were small, whereas 8.19% (77/940) were large. Hyperplastic polyp, tubular adenoma (TA), and tubulovillous adenoma (TVA) were identified in 43.19%, 53.83%, and 2.34%, respectively. Two-third of the polyps (60.78%) were located in the left side of colon (descending colon 10.73%, sigmoid colon 31.24%, and rectum 18.81%).

Of the 452 patients with polyps, 247 (54.65%) were Asian whereas 122 (26.99%), 71 (15.71%), and 12 (2.65%) were Caucasian, Middle Eastern, and other ethnic origins, respectively (Table 3). The mean

Table 2. Characteristics of the 940 polyps in 452 subjects, Bumrungrad Colonoscopy Registry 2007-2011

	%
Number of polyps	
1 polyp	53.76
2 polyps	20.80
3 polyps	10.18
4 polyps	7.74
5 polyps	3.98
More than 5 polyps	3.54
Size of polyps	
≤5 mm	84.04
6 to 9 mm	7.77
≥10 mm	8.19
Pathological types	
Hyperplastic polyp	43.19
Tubular adenoma	53.83
Tubulovillous adenoma	2.34
Segments	
Caecum	6.06
Ascending colon	15.20
Transverse colon	17.96
Descending colon	10.73
Sigmoid colon	31.24
Rectum	18.81
Left side (descending colon+sigmoid colon+rectum)	60.78

number of polyps was 2.08 (95% CI 1.92 to 2.24) with significant variation across the three main ethnic groups (p=0.01). Caucasian patients had relatively smaller polyps on mean (4.52 mm) than Asian (5.08 mm) and Middle Eastern (5.38 mm). Caucasian subjects had higher incidence of left-side polyps (65.63%) than the other ethnicities. Pre-malignant (TA+TVA) polyps were found in 56.08%, 50.19%, and 64.23% of the polyps of Asian, Caucasian, and Middle Eastern patients, respectively.

TA was the most common pathological type (20.77%), followed by hyperplastic (17.00%) and TVA (1.46%) (Table 4, Figure 1). Pre-malignant polyps were found in 21.62% of all patients, least commonly among Middle Eastern patients (17.12%).

The relationship between size and pathological type of the polyps is presented in Table 5. Interestingly, pre-malignancy was found in 52.91% (418/790) of small polyps.

Discussion

The present study provided additional evidence on the use of screening colonoscopy in patients from various ethnic origins. Despite potential overestimated institution-specific incidence, the present study revealed some interesting findings.

Previous study suggested that screening sigmoidoscopy could reduce the incidence of overall colorectal cancer by 33% and distal colorectal cancer by half[9]. As the study included only Caucasian subjects, who have relatively higher chance of lesions in left-side colon as suggested by the present study findings, the actual benefit of screening

Table 3. Ethnic variation of number, size, and pathological types of 940 polyps in 452 patients, Bumrungrad Colonoscopy Registry 2007-2011

	Subjects (cases)	Patients (cases)	Polyps	Polyps Mean±SD	Size (mm) Mean±SD	Left side (descending colon, sigmoid colon & rectum)	Hyperplastic	TA	TVA	Premalignant (TA+TVA)	Cancerous lesion
Asian	684	247	526	2.13±0.22	5.08±0.37	60.53%	117 cases 225 polyps	150 cases 282 polyps	12 cases 13 polyps	157 cases 295 polyps	5 cases 6 lesions
Caucasian	318	122	259	2.12±0.32	4.52±0.34	65.63%	69 cases 128 polyps	67 cases 128 polyps	2 cases 2 polyps	69 cases 130 polyps	1 case 1 lesion
Middle Eastern	257	71	137	1.93±0.39	5.38±0.64	54.74%	33 cases 49 polyps	42 cases 83 polyps	4 cases 5 polyps	44 cases 88 polyps	0 case 0 lesion
Others	41	12	18	1.50±0.64	6.39±3.56	44.44%	2 cases 3 polyps	11 cases 13 polyps	1 case 2 polyps	11 cases 15 polyps	0 case 0 lesion
Total	1,300	452	940	2.08±0.16	5.00±0.51	60.85%	221 cases 405 polyps	270 cases 506 polyps	19 cases 22 polyps	281 cases 528 polyps	6 cases 7 lesions

TA=tubular adenoma; TVA=tubulovillous adenoma

Table 4. Ethnic-specific incidences by pathological types, Bumrungrad Colonoscopy Registry 2007-2011

	Subjects	Hyperplastic	TA	TVA	Premalignant (TA+TVA)	Cancerous lesion
Asian	684	17.11%	21.93%	1.75%	22.95%	0.73%
Caucasian	318	21.70%	21.07%	0.63%	21.70%	0.31%
Middle Eastern	257	12.84%	16.34%	1.56%	17.12%	0.00%
Others	41	4.88%	26.83%	2.44%	26.83%	0.00%
Total	1,300	17.00%	20.77%	1.46%	21.62%	0.46%

TA=tubular adenoma; TVA=tubulovillous adenoma

Table 5. Relationship between size and pathological type of 940 polyps, Bumrungrad Colonoscopy Registry 2007-2011

	Total	≤5 mm	6 to 9 mm	≥10 mm
Hyperplastic polyp	405	372	19	14
Tubular adenoma	506	418	51	37
Tubulovillous adenoma	22	0	3	19
Carcinoma lesion	7	0	0	7
Total	940	790	73	77
Premalignant (%)	56.17	52.91	73.97	72.73

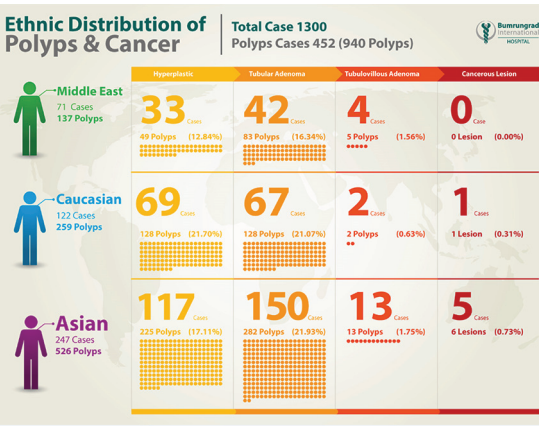

Figure 1. Ethnic distribution of polyps & cancer (940 polyps, 452 cases), Bumrungrad Colonoscopy Registry 2007-2011.

sigmoidoscopy in subjects from other ethnic groups might be lower. While a randomized controlled trial to assess clinical benefit of screening sigmoidoscopy in non-Caucasian population is not yet available, especially among Middle Eastern population, the interpretation of sigmoidoscopy benefit in published literature dominated by Caucasian samples should be regarded as overestimated.

While the association between various histological types and cancer risk has been well-documented, understanding of polyp size has been limited. Polyp less than 10 mm in size has generally been considered benign and therefore its removal has not been mandatory in major guidelines such as ACG[5], ASGE[6], and AGA[7]. While polyp of 1 to 5 mm in size was more prevalent among the authors' subjects (84.04%) than previous study (62.64%)[10], proportions of pre-malignant lesion were similar (52.91% versus 49.71%). The authors propose that polyps of all sizes should be removed when identified, unless technical difficulty prevent from doing so.

The use of data of a referral, non-population-based sample had some inherent potential limitations. The population studied was likely not the representative of the countries from which these individuals traveled for healthcare.

Conclusion

Number, size, distribution, and pathological type of colonic polyps vary across ethnic groups. As more than half of small polyps were TA, the authors propose that polyps of all sizes should be removed when feasible.

What is already known on this topic?

The prevalence of colonic polyp varied across ethnicities. Colonic polyp has been proved to be associated with colon cancer.

What this study adds?

The findings suggested that number, size, distribution, and pathological type of colonic polyps vary across ethnic groups. As more than half of small polyps were TA, the authors propose that polyps of all sizes should be removed when feasible.

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Conflicts of interest

The authors declare no conflict of interest.

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