• *BRIEF REPORTS* •

Prevalence of advanced colonic polyps in asymptomatic Chinese

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Received: 2004-03-09   Accepted: 2005-02-15

Abstract

AIM: To investigate the prevalence of advanced polyps in asymptomatic Chinese and to determine the risk of proximal advanced colonic polyps in subjects with and without polyps in the distal colon.

METHODS: Data were collected prospectively during colonoscopic examinations performed in 5 973 subjects as part of health evaluation at our unit from December 1997 to December 2003. Polyps were considered advanced, if they were larger than 10 mm or were tubovillous, villous or malignant. Proximal colon was defined as the splenic flexure and more proximal portions of the colon.

RESULTS: Colon polyps were detected in 971 (16.3%) subjects (613 males and 358 females) with their mean age being 56.6±10.7 years. Advanced polyps were noted in 199 (3.3%) individuals. Subjects were sub-classified according to the location of polyps into three groups: distal (569, 58.6%), proximal (284, 29.2%), and combined proximal and distal (118, 12.2%) groups. Subjects with advanced polyps in these three groups were 95 (9.8%), 56 (5.8%), and 48 (4.9%) respectively. In the 48 subjects with advanced combined polyps, 13 advanced polyps were distributed at the distal colon, 17 at the proximal colon, and 18 at both. Eighteen colon cancers including 12 at sigmoid and 6 at ascending colon were confirmed by final pathology. The relative risk for advanced proximal polyp according to distal findings was 3.1 (95%CI: 1.3-7.4) for hyperplastic polyp, 2.7 (95%CI: 1.4-5.3) for tubular polyp and 13.5 (95%CI: 5.1-35.4) for advanced polyp as compared to that for no polyp. However, 56 (28.2%) of 199 subjects with advanced polyps had no index polyps at the distal colon and might go undetected under sigmoidoscopic screening.

CONCLUSION: Although distal lesions can predict the risk of advanced proximal polyps, a substantial portion of Chinese with advanced proximal polyps is not associated with any distal sentinel lesions. These data have implications for screening policy of colon cancers in Taiwanese Chinese.

INTRODUCTION

Colorectal cancer (CRC) is an important health problem that carries high morbidity and mortality in the developed and Western countries[1]. The majority of CRCs arise from pre-existing adenomas[2]. This adenoma-adenocarcinoma sequence in colorectal carcinogenesis has provided an opportunity for screening asymptomatic individuals to prevent CRC. Indeed, accumulating evidence has indicated that the screening policy may greatly reduce the mortality and incidence of CRC[3]. Currently, CRC screening is suggested for those with 50 years of age and above. Standard recommendations include annual testing for fecal occult blood and periodic sigmoidoscopy. Colonoscopy is generally reserved for patients with positive screening tests or those with a high average risk[4].

Early detection and removal of potentially malignant polyps is the central element of CRC screening[3]. In this respect, efforts to control and prevent CRC lie in the reliable detection and resection of advanced adenomas before they become malignant. Atkin *et al.*[5], investigated the long-term risk of CRC after excision of recto-sigmoid adenomas and found that 88% of cancers develop in patients with high risk (namely villous, tubovillous histology, or >10 mm in diameter) recto-sigmoid adenomas. This study has led them to propose that a single examination with a sigmoidoscopy leading to full colonoscopy in patients with high risk recto-sigmoid adenomas is a cost effective and safe screening protocol[6]. The UK flexible sigmoidoscopy screening trial further supports that population screening by sigmoidoscopy is a worthwhile screening tool[7]. However, sigmoidoscopy is a sub-optimal approach for colon screening, and proximal adenomas without associated distal polyps may not benefit from early detection. The intrinsic risk of underdiagnosis by sigmoidoscopy has been illustrated by evidence of an increasing rightward trend of colon polyps and CRC[8]. It was also reported that 46-52% of proximal advanced adenomas are not accompanied with distal polyps[9,10]. Even

addition of fecal occult blood testing to sigmoidoscopy cannot significantly increase the detection of advanced neoplasia[11]. Similar observations have also been reported from other countries[12-15]. Therefore, another school of thought has advocated use of an ordinary colonoscope instead of a sigmoidoscope for screening[16].

Racial differences in the anatomical distribution of colorectal neoplasia exist between Western and Oriental countries. Variations in prevalence of proximal adenomas could influence the choice of colonoscopy *vs* sigmoidoscopy for screening in different populations. It remains uncertain whether clinical findings from Western countries are applicable to Chinese. In Taiwan, CRC ranks the third leading cancer death and its incidence has increased rapidly due to westernization of lifestyle[17]. The information regarding the prevalence of colorectal polyps in asymptomatic Chinese remains limited[14,15]. Our unit has provided self-paid screening for CRC since December 1997[18]. Taking this advantage, we performed a prospective study to investigate the prevalence of advanced polyps in asymptomatic subjects and to determine the risk of proximal advanced polyps in subjects with and without distal polyps.

MATERIALS AND METHODS

Since December 1997, our center has started to provide full colonoscopic service for all subjects who attended health checkup with a request for a colonoscopy. All colonoscopies were performed with Olympus Model CF200 or CF240 colonoscopes by experienced colonscopists[18]. Patients were prepared by oral administration of balanced electrolyte solution with polyethylene glycol on the day before the examination. All lesions identified were removed for histologic examination by either biopsy, polypectomy, or conventional surgery. The exact size of the polyp was determined immediately after polyp removal or by comparing the known width of opened biopsy forceps. The location and size of all polypoid lesions were recorded. The distal colon was defined as the rectum, sigmoid, and descending colon, whereas proximal colon was splenic flexure and more proximal portions of the colon. Polyps were considered advanced, if they were larger than 10 mm or were tubovillous, villous, or malignant.

The exclusion criteria included presence of colorectal symptoms, previous history of colorectal neoplasia, colonic surgery, inflammatory bowel disease, family history of colon cancer or first-degree relatives with related neoplasms of the breast, ovary or uterus, inability to give informed consent, and incomplete colonoscopic examinations. From December 1997 to December 2003, a total of 5 973 subjects who fulfilled the above criteria were enrolled for further analysis. Categorical data were analyzed by χ^2 test and relative risk of advanced proximal polyps was evaluated by logistic regression analysis.

RESULTS

Colonoscopy was successfully performed in the cecum in 5 973 subjects. The baseline characteristics of patients and colonoscopic findings are described in Table 1. Colon polyps were detected in 971 (16.3%) subjects (613 males and 358

females) with a mean age of 56.6±10.7 years. Among them, 199 (3.3%) subjects had advanced polyps. The prevalence of colorectal polyps in relation to demographic parameters is listed in Table 2. The prevalence of polyps (682/3 317, 20.6% *vs* 289/2 656, 10.9%, *P*<0.01) and advanced polyps (165/3 317, 3.0% *vs* 34/2 656, 1.3%, *P*<0.01) was significantly higher in subjects older than 50 years as compared to those younger than 50 years. Overall, male subjects had a significantly higher prevalence of polyps (613/3 125, 19.6% *vs* 358/2 848, 12.6%, *P*<0.01) and advanced polyps (124/3 125, 3.9% *vs* 75/2 848, 2.6%, *P*<0.01) than female subjects. The 971 subjects with polyps were subclassified according to the location of polyps into distal (567, 58.6%), proximal (284, 29.2%) and combined proximal and distal (118, 12.2%) groups. Advanced polyps in these three groups were 95 (9.8%), 56 (5.8%), and 48 (4.9%), respectively. In the 48 subjects with advanced combined groups, 13 advanced polyps were distributed at the distal colon, 17 at the proximal colon, and 18 at both. Eighteen colon cancers including 12 at sigmoid and 6 at ascending colon were confirmed by final pathology. The relative risk for advanced proximal polyp according to distal findings was 3.1 (95%CI: 1.3-7.4) for hyperplastic polyp, 2.7 (95%CI: 1.4-5.3) for tubular polyp and 13.5 (95%CI: 5.1-35.4) for advanced polyps as compared to that for no polyp (Table 3).

Table 1 Baseline characteristics of patients and colonoscopic findings

Characteristics	Patients, *n* (%)
Gender	
Female	2 848 (47.7)
Male	3 125 (52.3)
Age (yr)	
40-49	2 656 (44.4)
50-59	1 903 (31.9)
60-69	942 (15.8)
≥70	472 (7.9)
Colonoscopic findings	
No polyp	5 002 (83.7)
Proximal polyp	284 (4.8)
Distal polyp	569 (9.5)
Combined	118 (2.0)

DISCUSSION

The reported prevalence of colonic polyps varies widely due to differences in structure of the studies and sensitivities of the test used to define prevalence[19]. Referred and symptomatic patients cannot represent screening setting, but true incidence is difficult to calculate in symptom-free and unselected populations. It was estimated that 30% of the Western population have colonic polyps while a lower rate (10-15%) is noted in Asia and Africa[16]. Cross-sectional studies indicate that 5-10% of asymptomatic subjects (50-75 years old) have advanced colonic neoplasia[9,10]. Colonoscopy is the most sensitive imaging study for assessment of colonic polyps. Prior to our study, there were two studies dealing with the prevalence of colonic polyps in asymptomatic Chinese. Sung *et al*.[14], enrolled 505 subjects older than 50 years through health exhibitions and documented

Table 2 Prevalence of colorectal polyps in relation to demographic parameters, *n* (%)

Age group (yr)	Male			Female		
	Total no. of cases	Polyps	Advanced polyps	Total no. of cases	Polyps	Advanced polyps
40-49	1 348	186 (13.8)	18 (1.3)	1 308	103 (7.9)	16 (1.2)
50-59	1 067	217 (20.3)	38 (3.6)	836	104 (12.4)	23 (2.8)
60-69	480	140 (29.2)	40 (8.3)	462	84 (18.2)	19 (4.1)
≥70	230	70 (30.4)	28 (12.2)	242	67 (27.7)	17 (7.0)
Total	3 125	613 (19.6)	124 (4.0)	2 848	358 (12.6)	75 (2.6)

Table 3 Prevalence of advanced proximal polyps according to distal findings

Distal finding	Total	Advanced proximal polyp	Relative risk
No polyp	5 286	56	1.0
Hyperplastic polyp	181	6	3.1 (1.3-7.4)
Tubular adenoma	380	11	2.7 (1.4-5.3)
Advanced adenoma	126	18	13.5 (5.1-35.4)

12.5% of advanced polyps in Hong Kong Chinese. In contrast, Cheng *et al*.[15], detected only 1.3% of advanced polyps in Taiwanese Chinese. We found 16.3% of colonic polyps and 3.3% of advanced polyps respectively in 5 973 asymptomatic subjects older than 40 years. All these three studies were performed by colonoscopy, indicating that factors other than screening methods are responsible for the difference. The low prevalence in the later two studies may in part reflect the relatively large number of individuals younger than 50 years. In addition, inherent selection bias of enrolled subjects, geographic or dietary factors, and different incidence rates are among the plausible explanations but remain to be investigated by future studies.

Results from previous studies have shown that colonic polyps are more common in men than in women and increase in frequency with increasing age[13,19]. In agreement with these observations, subjects ≥50 years old and males tend to have a higher prevalence of both colonic polyps and advanced adenoma. To our knowledge, none of the studies have addressed the prevalence of colonic polyps in asymptomatic Chinese younger than 50 years. Overall, in subjects aged ≥50 years, colonic polyps and advanced adenomas are present in 20.6% and 3.0%, respectively, whereas 10.9% and 1.3% are found in patients aged <50 years. Taken together, these studies support the notion that age and gender may also influence the prevalence of colonic polyps[13,19]. Furthermore, our data suggest that in Chinese the optimal cut-off point of age for screening of average risk is similar to Western guideline because the incidence of colorectal polyps begins to rise above the age of 50 years[4].

From the standpoint of screening accuracy, colonoscopy is the only reliable way for detection of all colorectal polyps. However, current guidelines recommend sigmoidoscopy as the first-line CRC screening in view of expense, complication and patient's acceptability[4]. A crucial assumption underlying the practice of sigmoidoscopy is that, there exists an association between distal and proximal colonic neoplasia. Therefore, sigmoidoscopy may function as a gatekeeper and colonoscopy could be reserved for individuals with index polyps at the distal colon. Two recent systematic reviews support this notion and point out that distal polyps, irrespective of size or histology, are associated with an increased prevalence of synchronous proximal neoplasia[20,21]. In keeping with these observations, our results have demonstrated that distal hyperplastic, tubular, and advanced polyps are associated with 3- to 13-fold risk of synchronous, proximal advanced polyp.

Although distal colonic polyps can predict the risk of advanced proximal lesion, a clean rectum and sigmoid colon cannot guarantee any significant adenomas in the proximal colon. The proximal colon is not routinely examined when an index lesion is not detected in sigmoidoscopy. Consequently, the proportion of patients with adenoma in the proximal colon but without distal colonic neoplasia may influence the effectiveness of screening sigmoidoscopy[20,21]. The issue is becoming increasingly important, since several reports have revealed a rightward shift of CRC[8]. Moreover, available data from recent colonoscopic screening indicate that 46-52% of proximal advanced adenomas are not accompanied with distal polyps[9,10]. In the present study, we found 199 subjects had advanced polyps and 56 (28.1%) were isolated proximal lesions. Taken together, these findings implicate that a substantial portion of individuals with proximal neoplasia will go undetected by screening sigmoidoscopy and are at increased risk of cancer.

In summary, this study provides data on the background prevalence of colonic polyps in asymptomatic Chinese aged ≥40 years. The varied prevalence as compared to previous studies may be explained by variation of screening methods, selection criteria of enrolled subjects and different etiologic factors. About 30% of advanced proximal polyps are not associated with sentinel lesions, and might be missed by screening sigmoidoscopy. For the motivated individuals older than 50 years, whole colon screening by colonoscopy will detect more proximal lesions and give the greatest reassurance. The cost-effectiveness of colonoscopy needs to be evaluated further in future studies.

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