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# Prevalence of Colorectal Adenomatous Polyps in Patients Undergoing Colonosopic Examination at Rajavithi Hospital

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## ABSTRACT

Colorectal cancer fits the criteria for a disease suitable for a screening program because it's natural history is one of transition from a precursor (adenoma) to a malignant lesion. Polypectomy can reduce its incidence and the cancer-related death. The present study is aimed at studying the prevalence of colorectal adenomatous polyp in patients who underwent colonoscopic studies at the Gastroenterology Unit, Department of Medicine of Rajavithi Hospital, which is a tertiary care center for many provinces in Thailand. Clinical data were collected prior to the colonoscopic examinations. All detected polyps were removed and submitted for pathological analysis. The prevalence of colorectal adenomas was calculated. The data related to known or potential risk factors were analyzed for any correlation to the prevalence of colorectal adenomas. Results; a total of 200 patients without exclusion criteria were enrolled. Colonic polyps (any histological categories) were detected in 74 patients in whom polypectomy or biopsies were carried out. There were 35 patients with tubular adenoma (47.3%), 2 patients with tubulovillous adenoma (2.7%), 3 patients with villous adenoma (6.38%), 3 patients with adenocarcinoma (6.38%),18 patients with hyperplastic polyp (24.32%), 12 patients with inflammatory pseudo polyp (16.22%), and 1 patient with a retention polyp (1.35%). With the exception of age, no significant correlation was found between any risk factor and the prevalence. Conclusion; the prevalence of patients with colorectal adenomatous polyps in this study was 20%. Age was the only risk factor that was significantly the associated prevalence with adenoma in this study.

**Key words :** polyp, adenomatous polyp, colorectal polyp, Rajavithi Hospital.

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## INTRODUCTION

Colorectal cancer is the fourth most common cancer in the world, and the second most common cause of cancer related mortality in the western world. Colorectal cancer fits the criteria for a disease suitable for a screening program. It is a disease that is associated with considerable mortality and morbidity rates, and a premalignant precursor lesion usually precedes cancer[1]. The natural history of colorectal cancer is one of transition from a precursor to a malignant lesion, that lasts average of 5-10 years, thus providing a window opportunity for screening, effective intervention and prevention in 76-90% of cases.

The National polyp study demonstrated in 1993 that polypectomy could reduce the incidence of and the related death from colorectal cancer, and patients who are maintained adenoma-free are generally kept cancer-free[2,3].

Although it is generally believed that colorectal cancer is more prevalent in western countries, there has been a rapid rise over the past few decades in colorectal cancer incidence in Asia[4], including in Thailand. Llife-style and dietary habit of Thai people have changed a great deal, such as lower physical activity, bigger consumption of "junk food" and more fatty food, reduced intake of fruits and vegetables, etc, hence the rising and our incidence of colorectal cancer.

According to the World Health Organization data in 2002, colorectal cancer is the fourth and the fifth most common cancer in Thai men and Thai women respectively. It is also the fourth and the fifth leading causes of cancer death in Thai male and Thai female populations. A colorectal cancer screening program was thus recommended for Thai persons to early detect a premalignant lesion such as colorectal adenomatous polyp. The prevalence data and the demographic data of Thai persons with colorectal adenomatous polyps would be of much use and interest.

The prevalence of colorectal adenomatous polyp varies widely from country to country. Many studies have reported the prevalence of colorectal adenomatous polyps in the range of -7-44%[5-13].

Published data on the prevalence of colorectal adenomatous polyp in Thai persons, as well are not widely available as the demographic data. In 1992, Kamthorn Phaosawasdi et al. reported that the prevalence of colorectal adenomatous polyp in 533 patients undergoing colonoscopy at Vichaiyut Hospital was 7.7%[6].

Rajavithi Hospital is a tertiary care center for patients referred from many provinces in Thailand. Thus, the prevalence of colorectal adenomatous polyp in patients at this Hospital could representative of Thai population at large, not just in Bangkok.

The aim of this study is to assess the prevalence of colorectal adenomatous polyp in patients undergoing colonoscopic examination at the gastroenterology Unit, Department of Medicine, Rajavithi Hospital.

## MATERIALS AND METHODS

### Patients

All patients undergoing colonoscopic examination at Gastroenterology Unit, Department of Medicine, Rajavithi Hospital (from any indication including surveillance for colorectal cancer) were recruited. Patients with any one of these conditions were excluded:

1) previous colorectal cancer
2) previous colorectal polyp(s)
3) previous colorectal resection
4) incomplete colonoscopic examination (cecum not visualized)
5) unreliable historian
6) foreigner
7) patient not giving inform consent

The study began in April 2007. The calculated sample size of 200 patients was attained in January 2008. The demographic data of the patients is shown in Table 1.

## METHODS

At the appointment for colonoscopy, patients were informed of the study details and were asked to sign the consent. Patients were then interviewed and completed the physical examination.

**Bowel preparation**

Bowel preparation was performed with one of two formulas, i.e. either Sodium Phosphate solution or Polyethylene glycol-Electrolyte solution, chosen individually by the gastroenterologist in charge. If the bowel preparation was considered too poor by the endoscopist, the colonoscopic examination would be postponed.

**Colonoscopic examination**

Colonoscopies were performed by experienced endoscopists (staff) or gastrointestinal fellows acting under supervision. If there was (were) any polyp(s),

**Table 1.** Clinical characteristics of patients.

| Characteristics | No. of patients (%) | Mean (range) |
|---|---|---|
| Age (years) | | 55.51 (20-90) |
| - <50 | 66 (33%) | |
| - ≥50 | 134 (67%) | |
| Male | 77 (38.5%) | |
| Female | 123 (61.5%) | |
| Body weight (kg) | | 59.55 (35-111) |
| Height (cm) | | 160.30 (145-180) |
| BMI (kg/M$^2$) | | 23.12 (12.85-40.29) |
| - <30 | 189 (94.5) | |
| - ≥30 | 11 (5.5) | |
| Diabetes mellitus | 33 (16.5%) | |
| Dyslipidemia | 50 (25%) | |
| Familial history of colorectal cancer | 12 (6%) | |
| Smoking | | |
| - never | 155 (77.5%) | |
| - <20 pack-year | 34 (17.5%) | |
| - >20 pack-year | 11 (5.5%) | |
| Alcohol | | |
| - never | 144 (72%) | |
| - <30 gm/day | 32 (16%) | |
| - >30 gm/day | 24 (12%) | |
| NSAIDs use | | |
| - aspirin | 17 (8.5%) | |
| - non-aspirin | 10 (5%) | |
| Calcium supplement | 18 (9%) | |

the number, size, character and location of the polyp(s) were recorded, and polypectomy or biopsy were performed. All biopsy specimens were submitted for pathological analysis.

## Statistical analysis

This is a descriptive study of the prevalence of colorectal adenomatous polyp. At the end of the colonoscopic examination, the patients were categorized as the adenoma and the non-adenoma groups. The prevalence rate was calculated from number of cases in the adenoma group divided by the sum of the numbers of adenoma cases and non-adenoma cases. Although the sample size was not large enough, the potential risk was tried to identify (if there are strongly significant enough), by means of Chi-square test (or Fisher's exact test if small populations that means count less than five ≥25% of all cells) for the categorical data (gender, smoking status, presence of diabetes, presence of dyslipidemia, aspirin use, NSAIDs use and calcium supplement) and by mean of Student *t*-test for continuous data (age, body mass index, pack-years of smoking and volume of alcohol consumption). The odds ratio was also calculated and presented with the range of 95% confidence interval. All statistical analysis was based on the program SPSS version 11.5. For each analysis, a *p*-value of <0.05 was used for statistical significance.

## RESULTS

A total of 200 patients were enrolled. The clinical characteristics of all patients are shown in Table 1. The indications for colonoscopy were as follow; positive occult blood test 11 patients (5.5%), iron deficiency anemia 18 patients (9%), lower GI bleeding 20 patients (10%), surveillance for colorectal cancer 22 patients (11%), chronic diarrhea 39 patients (19.5%), bowel habit change 34 patients (17%), abdominal pain 30 patients (15%), constipation 13 patients (6.5%), metastatic adenocarcinoma 5 patients (2.5%) and other indications 8 patients (4%).

Colonic polyps (any histological categories) were detected in 74 patients in whom polypectomy or biopsies were carried out. Histological findings of all polyps were analyzed. There were 35 patients with tubular adenoma (47.3%), 2 patients with tubulovillous adenoma (2.7%), 3 patients with villous adenoma (6.38%), 3 patients with adenocarcinoma (6.38%) ,18 patients with hyperplastic polyp (24.32%), 12 patients with inflammatory pseudo polyp (16.22%), and 1 patient with a retention polyp (1.35%).

Polyp sizes of the polyps are ranged from 3 to 50 mm. All of tubulovillous adenoma, villous adenoma and adenocarcinoma were larger than 10 mm. the smallest being 15 mm. Only 3 of 35 tubular adenomas were larger than 10 mm.

The prevalence of patients with colorectal adenomatous polyps in this study was 20%, calculated from the sum of tubular adenoma, tubulovillous adenoma and villous adenoma (35+2+3 = 40) divided by the number of all patients (200) and multiplied by 100. Three adenocarcinomas were not included as they evolved on malignant colonic lesions.

Locations of the polyps were reported simply as the proximal colon (from the cecum to the splenic flexure) or the distal colon (from the splenic flexure to the rectum). In 10 cases (25%), the polyps were located in both parts of the colon. In 14 patients, the polyp(s) were located in the distal colon (35%), while in 16 patients the polyps were in the proximal colon (40%), the difference being non-significant.

As mentioned above, patients with and without adenoma(s) were compared for a variety of risk fac-

**Table 2.** Variables for univariate analysis of risk factors for colorectal adenomas

| Characteristics | Adenoma (n = 40) | Non-adenoma (n = 160) | *p*-value | Odd ratio (95% CI) |
|---|---|---|---|---|
| Age (years) | 63.78 | 53.44 | <0.0001* | |
| Male: female, n (%) | 18:22 (45:55%) | 59:101 (37:63%) | 0.345 | 1.401 (0.695-2.823) |
| BMI (kg/M$^2$) | 22.77 | 23.20 | 0.568 | |
| Diabetes mellitus, n (%) | 6 (15) | 27 (16.87) | 0.775 | 0.869 (0.332-2.274) |
| Dyslipidemia, n (%) | 14 (35) | 36 (22) | 0.102 | 1.855 (0.878-3.919) |
| Familial history of colorectal cancer, n (%) | 2 (5) | 10 (6.25) | 0.766 | 0.789 (0.166-3.755) |
| Smoking, n (%) | 13 (32.5) | 30 (18.75) | 0.058 | 0.479 (0.222-1.037) |
| Alcohol, n (%) | 11 (27.5) | 45 (28.13) | 0.937 | 1.032 (0.475-2.239) |
| NSAIDs use | | | | |
| - Aspirin, n (%) | 2 (5) | 15 (9.38) | 0.533 | 0.509 (0.111-2.322) |
| - Non-aspirin, n (%) | 1 (2.5) | 9 (5.63) | 0.690 | 0.43 (0.053-3.498) |
| Calcium supplement, n (%) | 1 (2.5) | 17 (10.63) | 0.132 | 0.216 (0.028-1.671) |

*student -*t* test

**Table 3.** Colorectal adenoma(s) in various age groups

| Age | Adenomas (n = 40) | | Non-adenoma (n = 160) | |
|---|---|---|---|---|
| | No. of pt. | Percent (%) | No. of pt. | Percent (%) |
| 20-29 | 0 | 0 | 13 | 8.13 |
| 30-39 | 0 | 0 | 15 | 9.38 |
| 40-49 | 3 | 7.5 | 35 | 21.88 |
| 50-59 | 11 | 27.5 | 43 | 26.88 |
| 60-69 | 14 | 35 | 31 | 19.38 |
| 70-79 | 9 | 22.5 | 16 | 10 |
| 80-90 | 3 | 7.5 | 7 | 4.38 |

**Table 4.** Subgroup analysis by Pearson Chi-square test

| Characteristic | Adenoma (n = 40) | | Non-adenoma (n = 160) | | *p*-value |
|---|---|---|---|---|---|
| | No. of pt. | percent | No. of pt. | percent | |
| Age <50 | 3 | 7.5 | 63 | 39.38 | <0.0001 |
| Age ≥50 | 37 | 92.5 | 97 | 60.63 | |
| BMI <30 | 38 | 95 | 151 | 94.38 | 0.877 |
| BMI ≥30 | 2 | 5 | 9 | 5.63 | |
| Nonsmoker | 27 | 67.5 | 130 | 81.25 | 0.058 |
| Smoker | 13 | 32.5 | 43 | 18.75 | |
| Nonsmoker | 27 | 87.1 | 130 | 81.25 | 0.113 |
| Smoke ≥20 pack-years | 4 | 12.9 | 7 | | |
| Alcohol nondrinker | 29 | 72.5 | 115 | 71.88 | 0.937 |
| Alcohol drinker | 11 | 27.5 | 45 | 28.13 | |
| Alco.hol nondrinker | 29 | 80.55 | 115 | 87.79 | 0.265 |
| Alcohol drinker >30 gm/d | 7 | 19.45 | 16 | 12.21 | |

**Table 5.** The prevalence of colorectal adenoma(s) by age-group

| Age group | Pt. with Adenoma(s) | Prevalence (%) |
|---|---|---|
| 20-29 | 0 | 0 |
| 30-39 | 0 | 0 |
| 40-49 | 3 | 7.89 |
| 50-59 | 11 | 20.37 |
| 60-69 | 14 | 31.1 |
| 70-79 | 9 | 36.0 |
| 80-90 | 3 | 30 |

tors. Age was the only risk factor that was significantly associated with adenoma occurrence in this study. The variables for univariate analysis of risk factors for colorectal adenomas are shown in Table 2.

Because of the significant difference of the mean age between the adenoma and the non-adenoma groups, and because the current standard recommendation to screening for colorectal cancer begins at the age of fifty, the prevalence of adenoma was analyzed by age groups, as well as in patients below and above 50 years of age. The results were shown in Table 3 and Table 4.

Patients were also classified into subgroups by BMI (<30 or ≥30 Kg/m$^2$), pack-years of cigarette smoking and alcohol consumption. Chi-square was use to compare the prevalence of polyp(s) in each subgroup, as shown in Table 5.

## DISCUSSION

The primary research question in this study is about the prevalence of colorectal adenomatous polyp(s) in patients undergoing colonoscopic examination at the Gastroenterology Unit, Department of Medicine, Rajavithi Hospital. The calculated prevalence was 20%, more than doubled the 7.7% reported in a previous study in 1992. The rising prevalence may be related at least in part to changes of life style and dietary habit in Thai society over the past 12 years or so. Most cases in this study were with symptoms, asymptomatic cases undergoing surveillance for colorectal cancer comprising only 10 % (some with familial history of colorectal cancer). The prevalence in the average-risk group may actually be lower than in this study.

Patients with adenoma(s) were significantly older than in the non-adenoma group ($p$ <0.0001). In this study, the prevalence of colorectal adenoma (s) in patients above 50 was rather significantly high. This is in keeping with published clinical guidelines on colorectal cancer screening recommending screening for all adults aged 50 or older[14]. The prevalence of colorectal adenoma in the 40-49 age group, on the other hand was significant lower than in those above 50, which was in agreement with a previous study of asymptomatic persons aged 40-49 undergoing colonoscopy in which there was a low yield of colorectal malignancy and adenoma[15].

Many studies have previously demonstrated an association between diabetes mellitus and colorectal adenoma with the odd ratio ranging from 1.3-1.74[16-19]. A study from Japan found that serum triglyceride (but not serum cholesterol) was an independent correlation factor with tubular adenoma[20]. Our study failed to demonstrate that such finding, which may be due to limitations such as lack of data on plasma glucose and lipid profile and the verbal reporting of diabetes and dyslipidemia by patients themselves.

In the study of male population, Giovannucci et al. reported that obesity (defined as BMI > 30) was associated with an increased risk of colorectal adenoma[21]. However, other studies did not demonstrate that relationship[17,19,20]. In our study, there were only 11 cases with BMI of 30 kg/m$^2$ or above, the sample size was too small. Thus the observation in our study that BMI was not associated with the prevalence of colorectal adenoma was inconclusive. Such was also the case with similar observations concerning, the use of NSAIDs, the use of calcium supplement and familial history of colorectal cancer. Many previous studies have demonstrated a protective effect of NSAIDs and calcium supplement on the development of colonic adenomas[22-25].

Other studies concluded that smoking is a risk factor of colorectal adenoma(s) while the role of alcohol is less clear[7,9,26-30]. Our study again failed to demonstrate the association between smoking and colorectal adenoma. This may be because the majority of our cases were non-smoking women, and ever among those with a smoking history there were more ex-smokers than current smokers. Interestingly, among the excess smokers (defined as >20 pack-years of cigarettes) the *p*-value was 0.058, which could become significant with a much larger sample size.

## CONCLUSIONS

The prevalence of colorectal adenomatous polyp(s) in patients undergoing colonoscopic examination at our Unit was 20%. Because of the small sample size and certain study limitations, age was the only risk factor that was significantly associated with adenoma in this study. Further study on the prevalence of adenoma with adequate sample size and associated risk factors in average-risk Thai persons to establish a suitable surveillance guideline for colonoscopic screening in Thai population.

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