Original Article

Screening Colonoscopy in First-degree Relatives of Patients with Colorectal Cancer

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Abstract

Background: Colorectal cancer (CRC), one of the most important causes of morbidity and mortality, has earned the attention of health-care systems widely. Screening programs are designed to detect patients at risk as effectively as possible. One of the major CRC risk factors is having a family member with diagnosed CRC.

Aim: To investigate the association between presence of polyps on colonoscopy and family history of CRC.

Methods: This was a retrospective cohort study in which the data was collected from colonoscopy reports of patients with/without familial history of CRC in Masoud private clinic, Tehran, Iran from October 1, 2011 to October 1, 2012. The association between presence of colorectal polyps on colonoscopy and family history of CRC was then assessed.

Results: A total of 210 patients were included in the study, constituting two groups with/without familial history of CRC with a 1:1 ratio (105 subjects in each group). Compared to subjects with a negative family history of CRC, a 2.7-fold (CI 95%: 1.2–6.24) fold increase was observed in those with a positive family history to have colorectal polyps. In multivariate regression analysis, family history of CRC was the only independent variable associated with presence of colorectal polyps (odds ratio: 3.12, CI 95%:1.22–8).

Conclusion: A positive family history of CRC is a risk factor for colorectal polyps.

Keywords: Colon cancer, first degree, screening, polyp

Cite this article as: Barzin G, Ostovaneh MR, Tayebi S, Vahedi H, Ansari R. Screening Colonoscopy in First-degree Relatives of Patients with Colorectal Cancer. *Arch Iran Med.* 2014; 17**(2)**: 115-117

Introduction

Colorectal cancer is one of the leading types of cancers with significant morbidity and mortality worldwide.[1] The prevalence of CRC is highly variable in different studies. According to the International Agency for Research on Cancer (IARC), the annual incidence of CRC is about 50,000.[2] In Iran, similar to other parts of the world, CRC has earned the attention of health-care policy makers due to its high annual incidence rate of 6–7.9 per 100,000.[3,4] Screening programs have been undertaken to achieve early diagnosis of precancerous polyps and adenomas; nevertheless, despite all screening programs, the incidence of CRC has not changed significantly in the United States during the past years.[5]

Apart from defined genetic and environmental predisposing factors for CRC, both retrospective and prospective studies demonstrated that a familial history of CRC may increase a person's lifetime risk of CRC.[6–12] There is also evidence indicating higher risk of colorectal polyps and adenomas in those with a family history of CRC.[13–16]

Nearly 16%–20% of people with CRC have been shown to have a first degree relative diagnosed with CRC.[17] Accordingly, efficient colonoscopy screening programs and early diagnosis of colorectal lesions are proposed to decrease the morbidity and mortality of CRC in first degree relatives of patients with CRC. In this retrospective cohort study, we aimed to assess the relationship between colorectal polyps in colonoscopy and family history of CRC.

Materials and Methods

This retrospective cohort study was performed in Masoud private clinic for gastrointestinal disorders, Tehran, Iran. Subjects were drawn from individuals referred to the Shariati hospital and Masoud clinic with non-specific upper GI complaints. The exclusion criteria were: (1) a documented history of overt or occult GI bleeding, iron deficiency anemia, or unexplained weight loss within 6 months prior to enrollment; (2) history of inflammatory bowel disease; (3) history of colonoscopy for any reason in the past 10 years; (4) individual history of colorectal adenomas or CRC; and (5) history of familial adenomatous polyposis or hereditary nonpolyposis CRC. After obtaining an informed consent, subjects were interviewed to obtain baseline characteristics and family history of CRC and then underwent anthropometric evaluations. The eligible subjects were classified into 2 groups with (group 1) and without (group 2) family history of CRC. The included individuals were matched according to age and gender in the two groups. All subjects then underwent total colonoscopy by a single expert gastroenterologist (R.A.).

Stata version 11 (college station, TX) was used for statistical analysis. Data were presented as mean (SD) or number (%) as appropriate. The difference in baseline between the two groups was tested using Fisher's exact test or non-parametric Mann Whitney U test. Subsequently, we calculated the relative risk of colorectal polyps in subjects with a family history of CRC compared to

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Accepted for publication: 13 January 2013

Table 1. Baseline characteristics of the participants.

	Group 1*	Group 2*	*P*-value
Colorectal polyps, *n* (%)	19(18.1)	7(6.7)	0.01
Age(years), mean (SD)	49.2(11.7)	49.8(13.06)	0.72
Gender, *n* (%)			
Male	52(49.5)	54(51.4)	0.89
Female	53(50.5)	51(48.6)	
Smoking, *n* (%)	16(15.2)	14(13.3)	0.7
Alcohol intake, *n* (%)	9(8.6)	9(8.6)	1
BMI, mean (SD)	26.8(3.5)	25.6(3.7)	0.02

Group 1 and 2 indicate those with or without family history of colorectal cancer, respectively. *SD = standard deviation, BMI = body mass index.

Table 2. Logistic regression analysis of different variables on colorectal polyps.

	Univariate		Multivariate	
Variables	**Odds ratio (CI95%)**	***P*-value**	**Odds ratio (CI95%)**	***P*-value**
Family history of colorectal cancer	3.13(1.25–7.8)	0.014	3.12(1.22–8)	0.018
Age	1.02(0.99–1.06)	0.162	1.02(0.98–1.06)	0.22
Female gender	0.5(0.21–1.18)	0.115	0.59(0.23–1.5)	0.27
Smoking	2.54(0.96–6.7)	0.059	1.69(0.57–5)	0.34
Alcohol intake	1.45(0.39–5.4)	0.58	—	—
BMI	1.09(0.98–1.2)	0.1	1.07(0.95–1.2)	0.26
Family history * gender	1.32(0.8–2.1)	0.25	—	—
Hosmer-Lemeshow goodness of fit *P*-value: 0.39; AUROC of the model: 72%				

those with negative family history.

Logistic regression analysis was performed to assess the independent association of the presence of colorectal polyps in colonoscopy and different variables. Variables with $P < 0.2$ on univariate regression analysis were included in the multivariate model.

Result

From October 2011 to October 2012, a total of 210 subjects were included in this retrospective cohort study, constituting two groups with (group 1) and without (group 2) family history of CRC with a 1:1 ratio (105 subjects in each group). Subjects were distributed according to age and sex between the two groups. The mean age of the participants in group 1 and 2 was 49.2 ± 11.7 and 49.8 ± 13.06, respectively. In group 1, 53 (50.5%) and in group 2, 51(48.6%) of the subjects were females. The baseline characteristics of the participants are outlined in Table 1. The incidence of colorectal polyps, as well as the mean BMI value in group 1, were significantly higher than group 2 (Table 1).

Compared to subjects with a negative family history of CRC (group 2), a 2.7-fold (CI 95%: 1.2–6.24) increase was observed in risk of colorectal polyps in those with a positive family history. As shown in Table 2, the impact of family history on incidence of colorectal polyps was modified by gender with $P < 0.2$ for test of homogeneity. In subgroup analysis, the risk ratio of colorectal polyps in those with a family history of CRC among males was 4.8 (CI 95%: 1.48–15.8) while it was 1.22 (CI 95%: 0.35 – 4.3) among females.

Table 2 outlines the odds ratios obtained from logistic regression analysis of risk factors for colorectal polyps. In univariate analysis, family history of CRC, age, gender, smoking and BMI were associated with presence of colorectal polyps and hence, were included in multivariate model. However, all but one factor lost significance on multivariate analysis and the positive family history of CRC was the only independent variable to be associated with colorectal polyps with an odds ratio of 3.12 while all other variables in the model were held constant.

Discussion

Our results showed that having a family member with a history of CRC increases the risk of colorectal polyps on colonoscopy by 2.7 times. Although age, gender, smoking and BMI were in correlation with presence of colorectal polyps in univariate analysis, family history of CRC remained as the only independent factor in multivariate analysis associated with detection of colorectal polyps on colonoscopy.

Our result was in line with previous studies in the literature. Gupta et al.,[18] showed that the prevalence of adenomas/polyps was significantly higher among individuals aged 40–49 years who had one first degree relative with colorectal polyps compared to the control subjects. The mean age of our patient group was 49.2 years which was not significantly different from the mean age of 49.8 years in the control group. In another study, Fuches et al.,[8] showed that the history of CRC in a family member increases the risk of CRC in the other members, especially young ones. It was also shown in another study that siblings and parents of patients with adenomas/polyps were at increased risk of CRC.[19]

The value of family history of CRC as a risk factor for colorectal polyps was mostly attributed to the males rather than females as observed in subgroup analysis. The discrepancy between males and females might be due to limitation in sample size and overall lower prevalence of colorectal polyps in our female cohort.

In conclusion, family history of CRC was an important risk factor for occurrence of colorectal polyps in our study.

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