Association Between Socioeconomic Status and Participation in Colonoscopy Screening Program in First Degree Relatives of Colorectal Cancer Patients

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Abstract

Background: Approximately 15% to 25% of colorectal cancer (CRC) cases have positive family history for disease. Colonoscopy screening test is the best way for prevention and early diagnosis. Studies have found that first degree relatives (FDRs) with low socioeconomic status are less likely to participate in colonoscopy screening program.

Objectives: The aim of this study is to determine the association between socioeconomic status and participation in colonoscopy screening program in FDRs.

Patients and Methods: This descriptive cross-sectional, study has been conducted on 200 FDRs who were consulted for undergoing colonoscopy screening program between 2007 and 2013 in research institute for gastroenterology and liver disease of Shahid Beheshti University of Medical Sciences, Tehran, Iran. They were interviewed via phone by a valid questionnaire about socioeconomic status. For data analysis, chi-square, exact fisher and multiple logistic regression were executed by SPSS 19.

Results: The results indicated 58.5% participants underwent colonoscopy screening test at least once to the time of the interview. There was not an association between participation in colonoscopy screening program and socioeconomic status to the time of the interview in binomial analysis. But statistical significance between intention to participate and educational and income level were found. We found, in logistic regression analysis, that high educational level (Diploma and University degree in this survey) was a predictor to participate in colonoscopy screening program in FDRs.

Conclusions: According to this survey low socioeconomic status is an important factor to hinder participation of FDRs in colonoscopy screening program. Therefore, planned interventions for elevation knowledge and attitude in FDRs with low educational level are necessary. Also, reducing colonoscopy test costs should be a major priority for policy makers.

Keywords: Colorectal Cancer, Colonoscopy Screening, First Degree Relative, Participation, Socioeconomic Status

1. Background

Colorectal cancer (CRC) is one of health problems in the world (1). It was the third most common cancer with nearly 1.4 million new cases in 2012. About 54 percent of colorectal cancer cases occurred in more developed countries (2). People with a first-degree relative (FDR) (parent, sibling, or offspring) have 2 to 3-fold risk of developing disease compared to individuals with no family history (3). According to Iranian annual of National Cancer Registration report, CRC is the fourth most common cancer after skin, breast and gastric cancer and its incidence rate was estimated 6 to 7.9 in 100,000 people. Furthermore, over the last 25 years there has been a growing trend (4-9). Because of family history or certain medical conditions, colorectal cancer screening should begin before age 50. Colonoscopy is the recommended screening method for first degree relatives (FDRs). Recent data indicate that FDRs of CRC patients significantly under-use colonoscopy screening. The participation rate lying between 30 and 64% (10-13). Several studies showed factors such as sex, age, health status, knowledge and attitude, number of colorectal cancer affected cases in family, age and stage of diagnosis are important to refuse to participate in colonoscopy screening program. Thus, one of the major known barriers is socioeconomic factors. A low socioeconomic status (low income, unemployment, low educational level, no health insurance coverage) has been associated with lower screening participation in many studies (14-17). One Turkish study indicated FDRs of patients having a higher educational level and income had screening testing twice more than the patients having lower income (36% vs 18%, P < 0,001) (18).

2. Objectives

The aim of this study was investigation of the association between socioeconomic factors and participation in colonoscopy screening program among first degree relatives of colorectal cancer affected cases.

3. Materials and Methods

This cross sectional descriptive study was conducted on 200 first degree relatives of colorectal cancer cases. A clustered probability design was used to select representative samples among total 400 high risk FDRs who were consulted and recommended to participate in colonoscopy screening program by physicians between 2007 and 2013 in research institute for gastroenterology and liver disease of Shahid Beheshti University of Medical Sciences, Tehran, Iran. Interviews were conducted via phone. The questionnaire included first degree relatives demographic and socioeconomic status including educational level, employment, income, health insurance coverage and health status in terms of smoking, alcohol consumption, suffering from diabetes and hypertension diseases. Finally they answered to these questions "Have you ever undergone colonoscopy screening test?" and "would you like to participate in colonoscopy screening program?" We investigated the association between participation of FDRs in colonoscopy screening program, and socioeconomic and health status variables through using chi-square and fisher exact test by SPSS 19. Also, multiple logistic regression analysis used to predict for participation in colonoscopy screening program. Odds ratios (ORs) and its 95% confidence intervals (CIs) were obtained.

4. Results

Of total 200 participants, 57.5% were female, 51.5%, 50 years and older, 85% married, 87.1% living in Tehran, 55.5% diploma and higher educational level, 83% were employed (full or part time) and 53.7% were with 10 million Rials and more monthly income. Only 10.5% did not have health insurance coverage. The mean of age, monthly income and body mass index (BMI) was 51.4 years, 16,000,000 Rials and 26.4 respectively. From interviewees population, 59% had undergone at least one colonoscopy screening test to the time of the interview. Further 60% interested to participate in colonoscopy screening program in future. Tables 1 and 2 shows results of bivariate analysis between participation in colonoscopy screening program to time of interview and decision to participate in future with demographic, socioeconomic and health status variables. As can be seen,

in data analysis by chi-square method, there was no statistical significance between demographic, socioeconomic, health status variables and participation in colonoscopy screening program to time of interview. But in the same analysis, there is statistical significance between educational level and monthly income with decision to participate in future. Analysis showed first degree relatives with academic educational level were more interested to participate in colonoscopy screening program (P = 0.006, ORs = 2.7 and 95%CI = 1.3 - 5.8). Also, FDRs with monthly income 10 million Rials and over participated more than others in this program (P = 0.005, ORs = 2.4 and 95%CI = 1.2 - 4.5). In the logistic regression analysis, high educational level (diploma and higher) was predictors for participating in colonoscopy screening program in first degree relatives (P = 0.031, ORs = 2.9 and 95% CI = 1.10 - 7.67). Other variables in this analysis were not significant statistically (Table 3).

5. Discussion

This study examined the association between socioeconomic status (SES) and participation in colonoscopy screening program in first degree relatives of colorectal cancer patients. We did not find association between demographic variables, socioeconomic status and participation in colonoscopy screening test to time of interview in bivariate chi-square analysis, whereas there was statistical significance in high level education and more income with decision to participate in same analysis. In this survey 59% FDRs have undergone at least once colonoscopy screening test to time of interview. A recent study indicated FDRs female with age below 50 underwent more than males and age 50 and older (19). Another study indicated FDRs with higher educational level and income participated in screening program more frequently (18). One survey in Korea showed income disparities for participating in colorectal cancer screening among both males and females (20). One older study in Canada confirmed people in the highest-income quintile had higher odds of receiving colonoscopy screening (adjusted OR 1.50; 95% CI 1.48 - 1.53) (21). In the current study we used multiple logistic regression for demographic and socioeconomic variables analysis to predict participation in colonoscopy screening program in FDRs. Therefore, high educational level (Diploma and university degree) was a predictor to participate in colonoscopy screening test. One published study in 2012 showed the frequency of screening in patients with higher educational level (ninth class), below the ninth grade and none were 33%, 21%, and 17% respectively (P = 0,017). The FDRs of patients with higher income levels (> 1000 Turkish Liras, equivalent to about 700 USD at the time of the study) had screening twice more often

Table 1. [Part 1] Results of Chi-Square Analysis in Association Between Participation in Colonoscopy Screening Program and Socioeconomic/Health Related Variables in First Degree Relatives

Variables	Participation to Time Interview		OR (95% CI)	P Value	Tendency to Participate		OR (95% CI)	P Value
	Yes, No. (%)	No Participation, No. (%)			Yes, No. (%)	No Tendency, No. (%)		
Total participants	118 (59)	82 (41)			120 (60)	80 (40)		
Sex			1.27 (0.7 - 2.2)	0.4			1.08 (0.6 - 1.9)	0.7
Female	65 (55.1)	50 (61)			68 (56.7)	47 (58.8)		
Male	53 (44.9)	32 (39)			52 (43.3)	33 (41.3)		
Marital status			1.6 (0.5 - 2.6)	0.7			0.9 (0.4 - 2.08)	0.8
Married	100 (84.7)	71 (81.6)			103 (58.8)	68 (85)		
Single, divorced, widowed	18 (15.3)	11 (13.4)			17 (14.2)	12 (15)		
Residency			0.5 (0.2 - 1.15)	0.1			0.6 (0.3 - 1.3)	0.2
Tehran	95 (81.9)	55 (72.4)			93 (80.9)	57 (47)		
Other	21 (18.1)	21 (27.6)			22 (19.1)	20 (26)		
Number of children			0.8 (0.3 - 1.7)	0.6			0.8 (0.4 - 1.8)	0.7
0 - 1	22 (18.6)	13 (15.9)			22 (18.3)	13 (16.3)		
≥ 2	96 (81.4)	22 (18.6)			98 (81.7)	67 (83.7)		
Educational Level			1.5 (0.7 - 3.03)	0.2			2.7 (1.3 - 5.8)	0.006[a]
Less than Diploma	86 (72.9)	66 (80.5)			83 (69.2)	69 (86.3)		
Diploma and over	32 (27.1)	16 (19.5)			37 (30.8)	11 (13.8)		
Employment			2.9 (0.5 - 16.6)	0.1			0.2 (0.3 - 2.5)	0.2
Full/Part time/Retired	116 (98.3)	78 (95.1)			115 (95.8)	79 (98.8)		
Jobless	2 (1.7)	4 (4.9)			5 (4.2)	1 (1.3)		
Monthly Income, Rials			1.7 (0.9 - 3.1)	0.08			2.4 (1.2 - 4.5)	0.005[a]
< 10 million	45 (41.3)	36 (54.5)			41 (38)	40 (59.7)		
≥ 10 million	64 (58.7)	30 (45.5)			67 (62)	27 (40.3)		

[a]Significant.

than the patients having lower income (36% vs. 18%, P < 0,001) (22). As a matter of fact, socioeconomic status (SES) is a powerful factor to participate in colonoscopy screening test. In this study there was not an association between participation in colonoscopy program and health insurance coverage but one study in Australia notified FDRs with private insurance were at significantly greater odds of receiving colonoscopy testing (23-25).

5.1. Conclusions

It is obvious that Socioeconomic Status is an important variable for participation in colonoscopy screening test. Therefore, when CRC screening is planned, elderly with positive family history, low educational level and lower income should get special attention to be convinced for undergoing colonoscopy screening test. Additionally, it is necessary that people with low income be covered by appropriate health insurance to participate in colorectal cancer screening tests. These data collected through interviewing via phone and we relied to interviewees answers. Therefore maybe recall bias happened.

Acknowledgments

Table 2. [Part 2] Results of Chi-Square Analysis in Association Between Participation in Colonoscopy Screening Program and Socioeconomic/Health Related Variables in First Degree Relatives

Variables	Participation to Time Interview		OR (95% CI)	P Value	Tendency to Participate		OR (95% CI)	P Value
	Yes, No. (%)	No Participation, No. (%)			Yes, No. (%)	No Tendency, No. (%)		
Total participants	118 (59)	82 (41)			120 (60)	80 (40)		
Age			0.8 (0.4 - 1.5)	0.6			0.6 (0.3 - 1.08)	0.09
Below 50	59 (50)	38 (46.3)			64 (53.3)	33 (41.3)		
≥ 50	59 (50)	44 (53.7)			56 (46.7)	47 (58.8)		
Health insurance coverage			0.7 (0.2 - 1.8)	0.5			0.8 (0.3 - 2.1)	0.7
Yes	107 (90.7)	72 (87.8)			108 (90)	71 (88.8)		
No	11 (9.3)	10 (12.2)			12 (10)	9 (11.3)		
Smoking habit			1.26 (0.6 - 2.6)	0.5			1.1 (0.5 - 2.4)	0.7
Yes	19 (16.1)	16 (19.5)			20 (16.7)	15 (18.8)		
No	99 (83.9)	66 (80.5)			100 (83.3)	65 (81.3)		
Alcohol consumer			1.08 (0.2 - 4.9)	0.9			0.2 (0.2 - 2.03)	0.1
Yes	4 (3.4)	3 (3.7)			6 (5)	1 (1.3)		
No	114 (96.6)	79 (96.3)			114 (95)	79 (98.7)		
Hypertension (HTN)			1.9 (0.9 - 4)	0.07			1.5 (0.7 - 3.1)	0.2
Yes	16.3 (13.6)	19 (23.2)			18 (15)	17 (21.3)		
No	102 (86.4)	63 (76.8)			102 (85)	63 (78.8)		
Diabetes			0.5 (0.2 - 1.5)	0.2			1 (0.3 - 2.5)	1
Yes	14 (11.9)	6 (7.3)			12 (10)	8 (10)		
No	104 (88.1)	76 (92.7)			108 (90)	72 (90)		
BMI			1.1 (0.6 - 1.9)	0.7			0.7 (0.3 - 1.2)	0.2
Fit	44 (37.6)	32 (40)			50 (41.7)	26 (33.8)		
Over-weight/Obese	73 (62.4)	48 (60)			70 (58.3)	51 (66.2)		

Footnotes

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Table 3. Results of Multiple Logistic Regression Analysis to Predict Participating in Colonoscopy Screening Program in First Degree Relatives

Variables	Surveyed	Reference	OR	95% C.I. for OR		P Value
				Lower	Upper	
Sex	Female	Male	1.319	0.614	2.835	0.478
Age	Below 50	$\geq$ 50	0.531	0.256	1.100	0.088
Marital status	Married	Single, divorced, widowed	1.215	0.399	3.704	0.732
City	Tehran	Other	0.809	0.336	1.946	0.635
Number of children	0 - 1	$\geq$ 2	0.933	0.339	2.568	0.894
Educational level	Diploma and over	Less than Diploma	2.912	1.105	7.675	0.031[a]
Employment	Full/Part time/Retired	Jobless	0.516	0.037	7.157	0.622
Income, Rials	$\geq$ 10 million	< 10 million	1.805	0.885	3.682	0.104
Health insurance coverage	Yes	No	1.593	0.384	6.604	0.521
BMI	Fit	Overweight/obese	0.806	0.381	1.707	0.574
DM	Yes	No	1.406	0.442	4.469	0.564
HTN	Yes	No	0.510	0.209	1.246	0.139
Alcohol consumer	No	Yes	2.679	0.221	32.457	0.439
Cigarette smoking	No	Yes	1.170	0.381	3.598	0.784

[a]Significant.

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