MICHIGAN BRFSS SURVEILLANCE BRIEF

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Colorectal Cancer Family History and Likelihood of Genetic Testing

Variations in *MLH1*, *MSH2*, *MSH6*, *PMS2*, or *EPCAM* genes increase the risk of developing Lynch syndrome (LS). LS is an inherited disorder that increases the risk of colorectal, endometrial, ovarian stomach, liver, kidney, brain, and certain types of skin cancers, and more often these cancers are diagnosed at a younger age.[1] A strong history of colorectal cancer in families means a person will be more likely to have Lynch syndrome. It is important to collect family health history to determine if your risk of colorectal cancer is higher than the general public.

Background

LS causes approximately 4,000 colorectal cases per year in the United States. The National Comprehensive Cancer Network (NCCN) recommends that all newly diagnosed colorectal cancer cases be referred to cancer genetic testing, especially those diagnosed under the age of 50.[1,2] This surveillance brief examines the prevalence of family history of colorectal cancer and the likelihood of colorectal cancer genetic testing by demographic subpopulations among Michigan adults.

Methods

Questions related to colorectal cancer family history, the likelihood of genetic testing and respondent demographics were included within the 2018 Michigan Behavioral Risk Factor Survey. These data were used to determine the prevalence of colorectal cancer family history and assess the likelihood of colorectal cancer genetic testing among Michigan adults. The colorectal cancer family history question asked about diagnoses of colorectal cancer among respondents or any of their parents, brothers, sisters, or children by a doctor, nurse, or other health professional. Furthermore, the likelihood of genetic testing was defined based on the question asked how likely respondents would be to have a genetic test to determine if the colorectal cancer in their family was inherited. Demographic subpopulations were examined to determine if significant differences exist among the colorectal cancer family history and the likelihood of colorectal cancer genetic testing.

What is the Michigan Behavioral Risk Factor Surveillance System (MiBRFSS)?

The MiBRFSS comprises annual, statewide telephone surveys of Michigan adults aged 18 years and older and is part of the national BRFSS coordinated by the CDC. The MiBRFSS follow the CDC BRFSS protocol and use the standardized English core questionnaire that focuses on various health behaviors, medical conditions, and preventive health care practices related to the leading causes of mortality, morbidity, and disability. Landline and cell phone interviews are conducted across each calendar year. Data are weighted to adjust for the probabilities of selection and a raking weighting factor is used to adjust for the distribution of the Michigan adult population based on eight demographic variables. All analyses are performed using SAS-callable SUDAAN® to account for the complex sampling design.

Results

As shown in Table 1, 9.8% of Michigan adults reported having a family history of colorectal cancer in 2018. Those aged 50 or older were more likely to report a family history of colorectal cancer compared to those who were under the age of 50. Females were also more likely to report a family history of colorectal cancer compared to males.

Among adults with a family history of colorectal cancer, only 14.3% reported having a colonoscopy, 16.0% reported having a blood stool test, and 14.4% reported having an appropriate fecal occult blood test (FOBT) or endoscopy. Eighty-six percent of those with no personal and/or family history of colorectal cancer reported having a colonoscopy, 84.0% reported having a blood stool test and 85.6% reported having appropriate FOBT or endoscopy (data not shown).

Only 20.1% of Michigan adults with a family history of colorectal cancer reported having heard of a genetic test for colorectal cancer. This could suggest their family members diagnosed with colorectal cancer are not receiving genetic testing. However, almost 60% did indicate that they would likely receive genetic counseling for colorectal cancer, which would be the next step towards genetic testing.

Table 1. Prevalence of Family History of Colorectal Cancer among Michigan Adults, BRFSS 2018

	Frequency	Percent	95% CI
Total	627,957	9.0	7.8-10.2
Race/Ethnicity			
White, non-Hispanic	567,603	10.1	8.8-11.6
Black, non-Hispanic	-	-	-
Other, non-Hispanic	-	-	-
Gender			
Male	244,487	7.1	5.7-8.9
Female	383,470	**10.7**	9.1-12.6
Age			
18-49	186,761	5.3	4.0-7.0
50+	441,196	**12.9**	11.1-14.8
Education			
Less than high school	54,793	8.3	4.6-14.4
High school grad	169,352	8.4	4.6-14.4
Some college	230,360	9.3	7.4-11.5
College graduate	173,452	9.5	7.6-11.7
Household Income			
<$35,000	166,507	8.9	6.9-11.3
≥$35,000	330,004	8.5	7.0-10.1
Insurance Status			
Yes	568,404	8.8	7.7-10.1
No	56,691	11.4	6.8-18.5
Prior Sigmoidoscopy or Colonoscopy			
Sigmoidoscopy	-	-	-
Colonoscopy	390,576	14.3	12.2-16.6
Appropriate FOBT or Endoscopy	368,231	14.4	12.3-16.7
Blood stool test	185,457	16.0	12.9-19.7
Likelihood of Genetic Counseling			
Likely	348,961	**59.0**	52.0-65.8
Not Likely at all	242,013	41.0	34.2-48.0
Heard of Genetic Testing for Colorectal Cancer			
Yes	122,755	20.1	15.4-25.8
No	487,946	**79.9**	74.2-84.6

CI = confidence interval.

-Data are suppressed when sample frequencies are less than 50 and/or a relative standard error is greater than 30%.

* Bold number indicates the prevalence of family history among that specific group was significantly different compared to other groups.

As shown in Table 2, 59.0% of Michigan adults would like to have a colorectal cancer genetic testing in 2018. Those who indicated that they would be most likely to get colorectal cancer genetic testing were white, female, and under the age of 50, but these differences were not significant. There were no significant differences in likelihood of genetic testing for colorectal cancer by income, education, insurance status, or prior sigmoidoscopy or colonoscopy.

Discussion

It is concerning that less than 20% of high-risk individuals report having had a current screening for colorectal cancer. Current guidelines recommend that high-risk individuals start getting colonoscopy beginning at age 40 to 45.[2] Our results also show that 80% of individuals at increased familial risk for CRC report no knowledge of genetic testing for the disease and very few report testing being carried out in the family. Genetic counseling with a board certified and/or eligible genetics provider, followed by genetic testing as appropriate, are the recommended first steps for anyone with a personal history or strong family history of these cancers. Early identification of LS can help reduce the impact of cancer and save the lives of family members who may also be at risk.

Table 2. Prevalence of Likelihood of Colorectal Cancer Genetic testing among Michigan Adults, BRFSS 2018

	Frequency	Percent	95% CI
Total	348,961	59.0	52.0-65.8
Race/Ethnicity			
White, non-Hispanic	320,301	59.2	51.8-66.2
Black, non-Hispanic	-	-	-
Other, non-Hispanic	-	-	-
Gender			
Male	120,606	53.3	41.8-64.4
Female	228,355	62.6	53.8-70.7
Age			
18-49	125,617	72.0	56.3-83.7
50+	223,344	53.6	45.7-61.4
Education			
Less than high school	-	-	-
High school grad	78,663	48.4	34.9-62.1
Some college	124,024	56.8	45.1-67.8
College graduate	109,470	70.5	59.3-79.7
Household Income			
<$35,000	80,022	50.4	37.2-63.5
≥$35,000	206,282	65.6	56.1-74.0
Insurance Status			
Yes	307,598	57.9	50.6-64.9
No	-	-	-
Prior Sigmoidoscopy or Colonoscopy			
Sigmoidoscopy	-	-	-
Colonoscopy	201,454	54.5	46.1-62.7
Appropriate FOBT or Endoscopy	183,068	53.2	44.7-61.6
Blood Stool Test	100,508	56.9	45.0-68.1

CI = confidence interval.
-Data are suppressed when sample frequencies are less than 50 and/or a relative standard error is greater than 30%.

References

1. Center for Disease Control and Prevention (CDC) 2020. Hereditary Colorectal (Colon) Cancer: Lynch Syndrome. Retrieved September 2021 from: https://www.cdc.gov/genomics/disease/colorectal_cancer/lynch.htm

2. National Comprehensive Cancer Network (NCCN) Guidelines for Detection, Prevention, & Risk Reduction (2021). Genetic/Familial High-Risk Assessment: Colorectal. Retrieved September 2021 from: https://www.nccn.org/guidelines/guidelines-detail?category=2&id=1436.

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