RESEARCH ARTICLE

Colorectal Cancer Screening in High-risk Populations: a Survey of Cognition among Medical Professionals in Jiangsu, China

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Abstract

　　To investigate the cognition of medical professionals when following screening guidelines for colorectal cancer (CRC) and barriers to CRC screening. Between February 2012 and December 2012, an anonymous survey with 19-questions based on several CRC screening guidelines was randomly administered to gastroenterologists, oncologists, general surgeons, and general practitioners in Jiangsu, a developed area in China where the incidence of CRC is relatively high. The average cognitive score was 26.4% among 924 respondents. Gastroenterologists and oncologists had higher scores compared with others ($p<0.01$ and $p<0.01$, respectively); doctor of medicine (M.D.) with or without doctor of philosophy (Ph.D.) or holders with bachelor of medical science (BMS) achieved higher scores than other lower degree holders ($P<0.05$). More importantly, doctors who finished CRC related education in the past year achieved higher scores than the others ($p<0.001$). The most commonly listed barriers to referring high-risk patients for CRC screening were "anxiety about colonoscopy without anesthesia", "lack of awareness of the current guidelines" and "lack of insurance reimbursement." Lack of cognition was detected among doctors when following CRC screening guidelines for high-risk populations. Educational programs should be recommended to improve their cognition and reduce barriers to CRC screening.

Keywords: High-risk - colorectal cancer - family history - screening - survey

Introduction

　　Colorectal cancer (CRC) is considered to be a main cause of malignancy-related death in the world (Parkin, 2001), and in China (Sung et al., 2005). It is known that the high risk population of CRC includes those with continuously positive fecal occult blood test (FOBT), with relatives of CRC or other cancer history, and with a history of intestinal adenoma, a history of cholecystectomy for chronic cholecystitis and chronic depression, or with symptoms, e.g., chronic diarrhea, chronic constipation, blood mucus, chronic appendicitis appendectomy. Despite CRC screening efforts have been made, a variety of disparities still exist, including patient factors: low income, lower education, refusal of colonoscopy and lack of medical insurance, and screening information (Jones et al., 2010; Centers for Disease Control and Prevention, 2010). Doctor-related factors are also notable, e.g., failure to communicate and ask family history from patients, or not to recommend screening to patients, or lack of reminder or diagnostic system (Taylor et al., 2003; Brawarsky et al., 2004; Dulai et al., 2004; Klabunde et al., 2005; Guerra et al., 2007). In addition, doctors cognition on latest guidelines could be an important factor impacting the screening practices (Klabunde et al., 2003; Klabunde et al., 2009; Jenn et al., 2012; Lin et al., 2012). On this background, it is important to explore factors that affecting the performance of screening guidelines on real clinical practice and to investigate cognition of doctors in various medical fields. Furthermore, if doctors did not have good knowledge of guidelines or could not identify high-risk individuals at an appropriate initiation point or interval, the high risk patients would lose the opportunity of diagnosis and treatment for CRC at early stage. At present, few studies focused on assessing doctors cognition on CRC screening guidelines in China and doctors barriers to appropriate CRC in high-risk people with a family history of colorectal disease. We hypothesized that there is a gap between doctors cognition and the update of guideline for CRC screening and useful modifications should be made to erase doctor barriers in CRC screening for high-risk populations. In this study, our aim is to investigate doctors cognition of CRC screening guidelines based on family history as well as patient symptoms, and to evaluate barriers for compliance with established CRC screening guidelines.

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Materials and Methods

Study population

The accessible population for this study consisted of gastroenterologists, oncologists, general surgeons, general practitioners from February 2012 to December 2012 in hospitals of Jiangsu province (include the cities of Yangzhou, Taizhou, Zhenjiang, Nanjing, Suzhou, Lianyungang, Xuzhou and Jiangyin) who could receive anonymous questionnaires.

Study design

All individuals received an anonymous questionnaire with a cover letter inviting participation in the survey. All answers were compared and scored based on the guideline

Table 1. Baseline Characteristics of the Survey Participations

Characteristics	Persons (%)
Total	924 (100)
Position:	
Gastroenterologist	579 (62.7)
Oncologist	63 (6.8)
General surgeon	69 (7.5)
General practitioner	195 (21)
Others	18 (1.9)
Title:	
Resident	291 (31.5)
Attending doctor	306 (33.1)
Associate professor	189 (20.5)
Professor	138 (14.9)
Hospital scale:	
Small	216 (23.4)
Middle	282 (30.5)
Large	426 (46.1)
Education on CRC recently:	
Last five years	201 (21.8)
Last three years	183 (19.8)
Last one years	129 (14)
Never	411 (44.5)
Academic degree:	
High school equally	24 (2.6)
Associated bachelor	129 (14)
Bachelor (BMS)	549 (59.4)
M.D.	198 (21.4)
M.D. & Ph.D.	24 (2.6)
Medical career:	
<5 years	216 (23.4)
5-10 years	204 (22.1)
10-20 years	264 (28.6)
>20 years	240 (26)
Whether have a relative with colorectal adenoma, polyps or related diseases?	
Yes	105 (11.4)
No	819 (88.6)
Your hospital with a gastrointestinal endoscopy?	
Yes	834 (90.3)
No	90 (9.7)
Whether read related CRC screening guidelines?	
Yes	684 (74)
No	240 (26)
Which CRC screening guidelines?	
Of China	558 (81.6)
Of USA	54 (7.9)
Of Asia-Pacific region	72 (10.5)

for early diagnosis, treatment and integrated prevention for CRC in China, National Comprehensive Cancer Network (NCCN), recent MSTF, ACS, & ACR CRC Guideline and the ACG guideline in the United States (Boolchand et al., 2002; Schroy et al., 2002; Levin et al., 2008; National Comprehensive Cancer Network, 2008; Rex et al., 2009; Fang et al., 2011; Amir et al., 2012; Lieberman et al., 2012; Saadettin et al., 2012). Survey completion was voluntary and no incentive was provided.

A 19-question survey was developed to assess cognition and adherence barriers to guidelines for CRC screening among high-risk population. In our study, we investigated gastroenterologists, oncologists, general surgeons, as well as general practitioners. The survey included five parts: 1 the personal medical background, e.g., position, title, hospital and recently CRC related education; 2 the target population: high-risk populations of CRC, diagnostic criteria; 3 family history: intestinal polyps, CRC, appropriate screening intervals and ages; 4 the intestinal endoscopic therapy indicated for polyp or CRC and the follow-up intervals; 5 the barriers for CRC screening.

Statistical analysis and research experience

Descriptive statistics were performed on all variables assessed by our instrument. The frequencies of answers to each of the questions were determined and comparisons of categorical variables were made using a chi-square test. Continuous variables were compared using the unpaired 2-tailed t-test or analysis of variance (ANOVA). All statistical analysis was performed using SPSS 17.0 (SPSS Inc., Chicago, Illinois) and $p<0.05$ was considered statistically significant. We have enough experience in conducting medical researches, and have published some results elsewhere (Huang et al., 2011; Li et al., 2011; Li et al., 2011; Li et al., 2011; Xu et al., 2011; Xu et al., 2011; Xu et al., 2011; Yan et al., 2011; Zhang et al., 2011; Gong et al., 2012; Liu et al., 2012; Gu et al., 2013; Li et al., 2012; Shu et al., 2012; Zhan et al., 2012; Zhan et al., 2012; Xu et al., 2012; Xu et al., 2012; Yu et al., 2012; Zhang, et al., 2012; Zhang et al., 2012; Chen et al., 2013; Dai et al., 2013; Deng et al., 2013; Huang et al., 2013; Liu et al., 2013; Liu et al., 2013; Liu et al., 2013; Lu et al., 2013; Sun et al., 2013; Wei et al., 2013; Wu et al., 2013; Yang et al., 2013; Yin et al., 2013; Yin et al., 2013).

Results

Study participants

A total of 10,000 doctors (11.2% of the doctors in Jiangsu province) were invited and 924 (9.24%) respondents completed the survey at the time of data collection (Table 1).

Cognition on CRC screening guidelines

The average score on questions assessing cognition on CRC screening guidelines was only 26.44%±8.86% (Mean ± SD) among all responders. Oncologists and gastroenterologists achieved slightly higher scores than general practitioners ($p<0.01$ and $p<0.01$, respectively). Doctors in large hospitals got higher scores than those

Table 2. The Questions in Scenarios and the Percentage of Correct Answer

The questions in scenarios	Correct%
* Which is the standard diagnosis method for CRC	64.9%
* Which are CRC high risk populations	24.7%
*A patient's father had adenomatous polyps at age 55.At what age would you recommend CRC screening for that patient and if the exam is normal how often would you screen	1.0%
* A patient has a father with CRC diagnosed in their 70s. At what age would you recommend screening that patient and if the exam is normal how often would you screen	2.6%
* A patient has a brother and father with CRC both diagnosed in their 70s. At what age would you recommend screening that patient and if the exam is normal how often would you screen	59.4%
* A patient has a grandmother with CRC diagnosed at 65. At what age would you recommend screening that patient and if the exam is normal how often would you screen	4.2%
*A patient was told that he has a family history of Familial Adenomatous Polyposis (FAP), but has not been genetically tested. At what age would you recommend screening and how often would you screen	24.7%
*A patient was told that he has a family history of Hereditary Nonpolyposis Colorectal Cancer (HNPCC), but has not been genetically tested. At what age would you recommend screening and how often would you screen	69.8%
*A patient was told that he has a family history of Familial Adenomatous Polyposis (FAP), but has not been genetically tested. At what age would you recommend screening and how often would you screen	12.0%
* At what age would you recommend starting to screen your patients with no family history of CRC	13.6%
* How often would you screen after endoscopic treatment for early CRC	72.7%
* How often would you screen for a patient after a resection of adenoma <1cm in diameter or tubular adenoma	4.1%
* How often would you screen for a patient after advanced adenoma treatment by colonoscopy	14.7%
* How often would you screen for a patient after radical resection of CRC	17.5%

in middle and small hospitals ($p<0.001$ and $p<0.05$, respectively). Doctors in hospitals with colonoscopy had higher scores than others ($p<0.01$). Higher degree holders got higher scores ($p<0.05$). More importantly, doctors who finished CRC related education in the past year had higher scores than the others ($p<0.001$). Cognition scores were not significantly different when analyzed by titles, medical career years. Scores did not differ significantly according to whether doctor had read CRC related screening guidelines or familiar with related intestinal diseases.

While 64.9% doctors knew the standard diagnosis process for CRC was colonoscopy combined with pathology diagnosis, only 13.6% of doctors correctly identified age 50 as the point to initiate CRC screening for an average risk Chinese patient. While 24.7% doctors selected the right answer for high risk factors to CRC, such as fecal occult blood test (FOBT) positive, a history of cancer and other intestinal adenoma and directly relatives with CRC history, only a few doctors correctly identified the screening intervals when the patient had a relative with intestinal polyps or CRC history. For example, for a high-risk patient whose parent had CRC at age 55, only 1% of doctors correctly identified the screening initiation point and follow-up interval (Table 2).

Doctor identified barriers to CRC screening

Among all study, 80.9% participants reported that "patient refusal to colonoscopy without anesthesia for anxiety" was the barrier to refer high-risk patients for CRC screening based on current established guidelines. The majority of the 665 physicians (72%) reporting barriers to CRC screening identified two or more factors. "Insufficient cognitive of current guidelines" was cited by 46.7% of participants, while 29.9% identified "lack of a full family history and communication" as a barrier. "Lack of insurance reimbursement for early referral for colonoscopy" was a barrier for 43.8%.

Items suggested by professionals

What needs to be provided by professionals to ensure their support for CRC screening? 82.8% selected the "CRC cognition and screening training". The other item "more information on screening program", "more communication to patient", "some economic compensation to patient" were selected by 63.3%, 33.8% and 16.7% doctors, respectively.

Discussion

This study assessed doctors cognition to follow CRC screening guidelines as well as the main barriers in their practices. According to the survey, overall doctors cognition on following CRC screening guidelines was generally low. Among all practitioners, gastroenterologists and oncologists scored only slightly higher than the other specialty even though they played an important role in diagnosis and treatment for CRC in early or advanced stages.

In China, doctors in large hospitals usually had a higher academic degree and better medical education background; they could continue their learning and get educational diploma after graduation. Thus, they scored higher in this survey. But regardless other factors, such as degree and title, doctors who got education on CRC cognition scored greatly higher than others suggesting that education once a year is an effective method to improve doctors cognition on CRC screening guidelines.

Gastrointestinal endoscope in a hospital contributed to doctors scores in the survey because they had more practice in treating patients with CRC. On the other hand, despite 74% of doctors read relevant guidelines in the survey, their scores had no significant difference compared with others (26.43% vs 26.25%) possibly because they forgot the guidelines due to few clinical practice suggesting that learning by doctor themselves is not the most effective way to improve their cognition.

Compared with a previous study of physician cognition and practice patterns (Schroy et al., 2002; White et al., 2012), we observed differences in cognition between different doctors, eg., oncologists, general surgeons and gastroenterologists, different title, different size of hospital, academic degree, etc. Though previous researches reported that physicians cited "a lack of time to inquire about a family history" as a barrier to screening, in our study, the main barrier is "patient refusal to colonoscopy without anesthesia for anxiety" (Schroy et al., 2002; White et al., 2012). Our findings are in line with prior studies that have reported "lack of a full family history and communication" and "Insufficient cognitive of current guidelines" as physician-identified barriers to CRC screening (Dulai et al., 2004; Guerra et al., 2007).

While this survey on physicians conducted in developed area of China provides an important assessment of cognition, practice patterns and barriers regarding CRC screening, a few limitations should be considered. First, the absolute number of physicians participating in the study was relatively small. However to our knowledge, this is one of the studies with largest sample size to evaluate doctors. In addition, the results of this study were based on doctors self-reported practices from clinical vignettes and could reflect actual situation. Nevertheless the strengths of our study include doctors from 8 cities in JiangSu province and got satisfactory response rate among providers. Thus we conclude that this survey reveals poor cognition of CRC screening guidelines for high-risk populations across practitioners in different fields. Majority of doctors should be trained to follow CRC screening guidelines in order to improve their cognition and prevent CRC in China where the CRC incidence is arising (Butterly et al., 2010).

Acknowledgements

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