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Continuity of Care and Colorectal Cancer Screening by Vietnamese American Patients

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Abstract

Background—Colorectal cancer (CRC) screening rates among Asian Americans are 30–50% lower than among Whites. Using practice management and electronic medical records data from a community health center, we examined the association of CRC screening with continuity of care and comorbidity. These variables have not previously been studied in Asian American and limited-English proficient populations.

Methods—After obtaining IRB approval, we extracted data in 2009 on age-eligible Vietnamese patients who had one or more clinic visits in the prior 24 months. Our analysis examined associations between CRC screening (per current US Preventive Services Task Force guidelines) and clinic site, demographics, insurance status, continuity of care, comorbidities, and provider characteristics.

Results—We identified a total of 1,016 eligible patients (604 at Clinic 1 and 412 at Clinic 2). Adherence to CRC screening was lower for patients who were male; lacked insurance; had only one medical visit in the past 12 months; and had no assigned primary care provider. Our multivariable models showed higher screening rates among patients who were female; had public health insurance; and had more than one medical visit in the past 12 months, regardless of “high” or “low” continuity of care.

Conclusions—We found no association between higher continuity of care and CRC screening. Additional primary care systems research is needed to guide cancer screening interventions for limited-English proficient patients.

Keywords

Colorectal cancer; screening; Vietnamese Americans

Introduction

Colorectal cancer (CRC) ranks in the top three most common cancers among Asian Americans in the United States (US) (Jemal et al., 2008; Miller et al., 2008). CRC is also a leading cause of cancer mortality among several Asian ethnic subgroups (Miller et al., 2008). In particular, among Japanese American men and women, CRC incidence rates

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exceed those of non-Hispanic Whites (Miller et al., 2008). As the earliest Asian immigrant group in the US, Japanese Americans may serve as the "canary in the coal mine," since cancer incidence appears to increase among Asian immigrant populations the longer they reside in this country (Tu et al., 2006; Kagawa-Singer, 2008).

Despite high levels of CRC incidence and mortality, CRC screening rates among Asian Americans are 30–50% lower than among non-Hispanic Whites (Maxwell et al., 2000; Goel et al., 2003; Swan et al., 2003; Thorpe et al., 2005; Wong et al., 2005; Kandula et al., 2006; Jerant et al., 2008; Ma et al., 2009; Maxwell and Crespi, 2009; Walsh et al., 2009; Holden et al., 2010). Using a nationally representative sample, Jerant et al. found that only 33.8% of Asian Americans were up-to-date with CRC screening, compared to 57.2% of non-Hispanic Whites, 48.2% of African Americans, and 36.1% of Hispanics (Jerant et al., 2008). The authors concluded that, whereas socioeconomic, access, and language barriers seem to drive the CRC screening disparities experienced by African Americans and Hispanics, additional factors may exacerbate the disparities experienced by Asians. Although CRC screening rates have increased among all US ethnic groups (Joseph et al., 2008), disparities between non-Hispanic Whites and Asian Americans are either persistent or widening even in the Medicare-insured population (Fenton et al., 2008; Fenton et al., 2009).

The situation among Vietnamese Americans is especially concerning. A study of the California population showed that Vietnamese Americans were one of three Asian ethnic groups with the lowest CRC screening prevalence (Maxwell and Crespi, 2009). Other studies have shown that rates of CRC screening in Vietnamese Americans are lower than in non-Hispanic whites (Jenkins et al., 1990; Walsh et al., 2004; Wong et al., 2005). In a recent study of Vietnamese Americans in California and Texas, only 46% of respondents reported being up-to-date on CRC screening (Nguyen et al., 2008). Further, CRC is the third most common cancer for Vietnamese Americans of both genders (Cockburn and Deapen, 2004). Since 1990, the age-adjusted incidence rate has increased for Vietnamese in the Greater San Francisco Bay Area (Gomez et al., 2005).

This study reports CRC screening rates of Vietnamese Americans at a community health center in the Pacific Northwest. We successfully extracted data from practice management and electronic medical records that enabled an examination of continuity of care and comorbidity. These two variables have not previously been studied in Vietnamese or other Asian American populations.

Materials and Methods

Setting

We conducted this research in 2009 in collaboration with International Community Health Services (ICHS), a community health center serving predominantly low income and limited-English proficient Asians in the metropolitan area of Seattle, Washington. All study procedures were approved by the Human Subjects Committee of the University of Washington in Seattle.

ICHS provides comprehensive primary care services at two clinics in the Seattle area, which we denote as Clinic 1 and Clinic 2. In 2009, only 16% of patients at ICHS had private insurance, while 62% had public insurance and 22% had no insurance (International Community Health Services, 2009). Vietnamese patients (26%) represented the second largest ethnic group at ICHS after the Chinese (41%). A significant proportion of ICHS patients have limited English proficiency, with almost 80% reporting their preferred language as other than English.

Sampling

We extracted data from the ICHS NextGen Enterprise Practice Management and Electronic Medical Records system as of March 1, 2009. In accordance with the US Preventive Services Task Force (USPSTF) CRC screening guidelines, our study sample consisted of age-eligible Vietnamese patients who were 50 to 75 years of age, 12 months before the date of our data extraction (U.S. Preventive Services Task Force, 2008). We restricted our analysis to "active" patients, defined as patients who had one or more visits to the clinic in the past 24 months. Using ICD 9 codes, we excluded patients with a diagnosis of CRC and inflammatory bowel disease.

Demographic, insurance, primary care provider, clinic visit, and flexible sigmoidoscopy data were extracted from the practice management system. We used the following codes to identify sigmoidoscopies: CPT codes 45300, 45305, 45308-9, 45315, 45317, 45320, 45330, 45331, 45333, 45334, 45338, and 45339; HCPCS code G0104; and ICD-9-CM codes 45.24, 48.23, and 48.24. Information regarding comorbidities, collection date and results of fecal occult blood testing (FOBT), and colonoscopy were extracted from the electronic medical records system.

Analysis

First, we compared patient characteristics and rates of CRC screening (FOBT, flexible sigmoidoscopy plus FOBT, and colonoscopy) at the two clinic sites, using the Chi-square test and, if necessary, Fisher's Exact test. Subsequently, we examined associations between CRC screening and clinic site, demographics, insurance status, continuity of care, comorbidities, and provider characteristics. Per current USPSTF guidelines, we defined adherence to CRC screening guidelines as having completed: 1) three FOBT cards in the past year; 2) flexible sigmoidoscopy in the past five years plus three FOBT cards in the past three years; or 3) colonoscopy in the past 10 years (U.S. Preventive Services Task Force, 2008).

The Usual Provider of Care (UPC) index calculates continuity of care as n/N, where N is the total number of primary care visits in the last 24 months, and n is the number of visits to the plurality primary care provider (the "usual" or most visited provider) (Fenton et al., 2008). We defined high continuity as three or more visits, with the plurality primary care provider seen at least 50% of the time, or two visits, with the plurality primary care provider seen both times. We defined low continuity as three or more visits, with the plurality primary care provider seen less than 50% of the time, or two visits, with the plurality primary care provider seen only once. We also used a third category, comprising patients who had only one visit to the clinic in the past 24 months.

These are the same UPC categories used by Fenton et al., (Fenton et al., 2008), but their study, as well as another (Reid et al., 2005), used the observed median percentage of visits to the plurality primary care provider as the cutoff in defining "high continuity" among patients with three or more visits. We arrived at the same categories because Fenton et al.'s median happened to be 50% of visits. In fact, the median among patients with three or more visits can be very high or very low, and might lead to an obscure categorization of UPC-as, for example, in a clinic where continuity is very high, such that seeing a different provider in just one of several visits could result in categorization as "low continuity." For this reason, we specified the actual percentage for our cutoff, instead of taking the empirical value from the observed data.

We applied the Charlson-Deyo comorbidity index to examine the association of CRC screening with comorbidities (Deyo et al., 1992). Given the distribution of this index in our sample, we defined three comorbidity categories: 0, 1, and >2.

Using multivariable logistic regression, we examined the independent effects of the following variables on CRC screening outcomes: clinic site, age, gender, insurance, continuity of care, type of provider, and languageconcordant provider. We first examined the main effects, and then added the interaction terms of provider type and language concordance, which we hypothesized a priori.

Results

Clinics 1 and 2 had 604 and 412 eligible patients, respectively. As detailed in Table 1, we found significant differences between the two clinics with regard to number of visits in the last 12 months; type of primary care provider; language concordance with provider; and continuity of care. More patients at Clinic 2 had never had FOBT, and more patients at Clinic 1 had FOBT in the past year (Table 2). Women, patients with public health insurance, and patients with both lower and higher continuity with their provider were more likely to have had FOBT in the past year (Table 3). Younger patients, those with no insurance, and those with only one medical visit in the past 12 months were significantly less likely to have had a colonoscopy in the past 10 years. Adherence to CRC screening per USPSTF guidelines was lower for male gender, having no insurance, having only one medical visit in the past 12 months, and lacking an assigned primary care provider.

Our multivariable logistic regression models (Table 4) showed higher screening rates among patients who were female, had public health insurance, and had UPC indices (“high” or “low” continuity, as opposed to “1 visit”). Patients with public health insurance had significantly higher FOBT screening rates than those with no insurance and those with private insurance (OR=1.73, 95% CI 1.08, 2.28). With respect to CRC screening adherence, patients with both public and private health insurance had significantly higher rates than those with no insurance. Our results did not show significant differences in CRC screening adherence rates between patients with public or private health insurance. We did not find any significant differences between high versus low continuity indices for FOBT or CRC screening adherence (Table 4).

Discussion

Clinics 1 and 2 had 604 and 412 eligible patients, respectively. As detailed in Table 1, we found significant differences between the two clinics with regard to number of visits in the last 12 months; type of primary care provider; language concordance with provider; and continuity of care. More patients at Clinic 2 had never had FOBT, and more patients at Clinic 1 had FOBT in the past year (Table 2). Women, patients with public health insurance, and patients with both lower and higher continuity with their provider were more likely to have had FOBT in the past year (Table 3). Younger patients, those with no insurance, and those with only one medical visit in the past 12 months were significantly less likely to have had a colonoscopy in the past 10 years. Adherence to CRC screening per USPSTF guidelines was lower for male gender, having no insurance, having only one medical visit in the past 12 months, and lacking an assigned primary care provider.

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any significant differences between high versus low continuity indices for FOBT or CRC screening adherence (Table 4). In conclusion to our knowledge, this is the first study to examine the association of continuity of care with CRC screening in an underserved and predominantly limited-English proficient Asian American clinic population. Community-based programs have successfully promoted cancer screening among limited-English proficient Asian Americans and Latinos. However, inadequate information is available to guide cancer promotion efforts in the primary care setting for limited-Engish proficient patients (Taylor et al., 2002; Maxwell et al., 2003; Fang et al., 2007; Mock et al., 2007; Kagawa-Singer et al., 2009; Ma et al., 2009; Meersman et al., 2009; Nguyen et al., 2009; Wu et al., 2010).

Primary care is an ideal setting to facilitate preventive health behaviors (Menon et al., 2008). In fact, Klabunde et al. emphasized that primary care providers are central to implementing national guidelines and achieving public health targets for CRC screening, because they recommend, perform, and/or refer patients for CRC screening (Klabunde et al., 2007; Klabunde et al., 2008).

Continuity of care is generally considered a cornerstone of primary care (Starfield, 1998; Stokes et al., 2005; Jee and Cabana, 2006). When providers see familiar patients, their greater awareness of the patients' preventive care needs may result in the delivery of more effective preventive counseling (Jaen et al., 1994; Kiefe et al., 1998). In addition, longer patient-physician relationships have been shown to be associated with a higher level of patient-physician trust (Mainous et al., 2001). This foundation of trust may foster patient adherence to physician recommendations (Kao et al., 1998).

Ferrante et al. found a positive association between continuity with the same physician and preventive care (Ferrante et al., 2010). Similiarly, in a population-based sample of primary care patients enrolled in a large prepaid health plan, Fenton et al. found that higher continuity of care was associated with a significantly higher likelihood of FOBT screening and a trend toward higher likelihood of receiving CRC screening of any type (Fenton et al., 2008). They also found that higher continuity significantly decreased the likelihood of receiving sigmoidoscopy and colonoscopy.

In this community health center population, compared with patients who had one visit to the clinic in the last 12 months, those with both lower and higher UPC indices had significantly higher FOBT and CRC screening adherence. Although over 70% of our study sample had five or more clinic visits in the past year, only one-quarter of the patients met our definition for high continuity of care, with 16% of patients in Clinic 1 and 44% of patients in Clinic 2 fulfilling our criteria (Table 1). Contrary to previous findings (Fenton et al., 2008), we did not find any significant differences in FOBT or CRC screening adherence between patients with higher and lower continuity of care.

A major strength of this study is the clinic population data available from practice management and electronic medical records. Rodriguez et al. recommended that studies of continuity should use administratively derived measures, because patient-reported measures appear to be subject to biases that can overestimate the relationship between visit continuity and certain patient-reported outcomes (Rodriguez et al., 2007). We also directly extracted the outcome measure of CRC screening from the electronic medical record system. When patients return FOBT cards, their results are directly entered into the laboratory section of the electronic medical record system and the tests are billed. Similarly, flexible sigmoidoscopy performed at the community health center is captured in the patient's electronic medical record and billed accordingly. Studies of self-reported CRC screening

indicate frequent overestimation of screening due to patients' desire to report their behavior in a favorable light (Jones et al., 2008; Partin et al., 2008; Walter et al., 2009).

This study also has several potential limitations. First, although medical records are considered the gold standard for patient data, the comprehensiveness of medical records from one organization depends on the accuracy with which they document health services received from outside organizations. Our study may therefore underestimate CRC screening in this patient population, in the unlikely scenario where a significant proportion of Vietnamese patients seek primary care and CRC screening from multiple organizations. In addition, because colonoscopies are referred to specialists outside the community health center, we relied solely on documentation entered into the health center's electronic medical records.

Second, given the small number of providers at each clinic, our results on language concordance and CRC screening are difficult to interpret. Finally, only 76 patients had a Charlson-Deyo comorbidity score of 2 or greater, thus limiting our ability to stratify this variable by using the standard categories of best, average, and worst health (Walter et al., 2009).

Nutting et al. found that continuity of physician care appeared to be particularly important to vulnerable patients (Nutting et al., 2003). Although our study did not find an association of higher continuity of care with CRC screening, this result may not be generalizable to other community health centers that serve limited-English proficient patients. Additional research is needed to better understand and guide interventions to promote screening in primary care settings that serve Asian American and other limited-English proficient patients. As primary care increasingly relies on a team approach, system factors that facilitate CRC cancer screening among limited-English proficient patients must be identified (Hudson et al., 2007; Klabunde et al., 2007; Ferrante et al., 2010).

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Table 1

Participant Characteristics - Vietnamese Patients Seen by International Community Health Services in the Last 24 Months

	ICHS (N=1016) N(%)	Clinic 1(N=604) N(%)	Clinic 2 (N=412) N(%)	p value
Age				
50–64	725 (71.4%)	428 (70.9%)	297 (72.1%)	0.72
65+	291 (28.6%)	176 (29.1%)	115 (27.9%)	
Gender				
Female	684 (67.3%)	404 (66.9%)	280 (68%)	0.73
Male	332 (32.7%)	200 (33.1%)	132 (32%)	
Insurance Status				
None	144 (14.2%)	83 (13.7%)	61 (14.8%)	0.14
Public	698 (68.7%)	406 (67.2%)	292 (70.9%)	
Private	174 (17.1%)	115 (19%)	59 (14.3%)	
Number of visits last 12 months				
1–2	152 (15%)	81 (13.4%)	71 (17.2%)	0.04
3–4	137 (13.5%)	73 (12.1%)	64 (15.5%)	
≥ 5	727 (71.6%)	450 (74.5%)	277 (67.2%)	
Primary Care Provider				
None	18 (1.8%)	4 (0.7%)	14 (3.4%)	<.0001
MD	582 (57.3%)	440 (72.8%)	142 (34.5%)	
PA/ARNP	416 (40.9%)	160 (26.5%)	256 (62.1%)	
Language Concordant PCP				
None	18 (1.8%)	4 (0.7%)	14 (3.4%)	0.0003
No	506 (49.8%)	323 (53.5%)	183 (44.4%)	
Yes	492 (48.4%)	277 (45.9%)	215 (52.2%)	
Continuity Index				
1 Visit	83 (8.2%)	44 (7.3%)	39 (9.5%)	<0.0001
Lower	658 (64.8%)	465 (77%)	193 (46.8%)	
Higher	275 (27.1%)	95 (15.7%)	180 (43.7%)	
Charlson-Deyo Comorbidity Score				
0	720 (70.9%)	424 (70.2%)	296 (71.8%)	0.84
1	220 (21.7%)	133 (22%)	87 (21.1%)	
≥ 2	76 (7.5%)	47 (7.8%)	29 (7%)	

ARNP = nurse practitioner; CRC = colorectal cancer; FOBT = fecal occult blood test; ICHS = International Community Health Services; MD = physician; PA = physician assistant; PCP = primary care provider

Table 2

Use of Colorectal Cancer Screening Tests – Vietnamese Patients seen by International Community Health Services in the Last 24 Months

	ICHS (N=1016) (%)	Clinic 1 (N=604) (%)	Clinic 2 (N=412) (%)	p value
FOBT				
Never	570 (56.1%)	323 (53.5%)	247 (60%)	0.01
> 3 years	47 (4.6%)	23 (3.8%)	24 (5.8%)	
1–3 years	182 (17.9%)	110 (18.2%)	72 (17.5%)	
≤ 1year	217 (21.4%)	148 (24.5%)	69 (16.7%)	
Sigmoidoscopy				
Never	972 (96%)	577 (95.5%)	395 (95.9%)	0.15
> 5years	9 (.9%)	3 (0.5%)	6 (1.5%)	
< 5years	35(3.4%)	24 (4%)	11 (2.7%)	
Colonoscopy				
Never	776 (76.4%)	472 (78.1%)	304 (73.8%)	0.06
> 10years	2 (.2%)	0 (0%)	2 (0.5%)	
< 10years	238 (23.4%)	132 (21.9%)	106 (25.7%)	
CRC Screening Adherence [a]				
No	598 (58.9%)	350 (57.9%)	248 (60.2%)	0.52
Yes	418 (41.1%)	254 (42.1%)	164 (39.8%)	

[a] CRC Screening Adherence per US Preventive Services Task Force Guideline;

CRC = colorectal cancer; FOBT = fecal occult blood test; ICHS = International Community Health Services

Table 3

Sociodemographic Factors Felated to the use of Colorectal Cancer Screening Tests per US Preventive Services Task Force Guideline

	FOBT N(%)	Sigmoidoscopy + FOBT N(%)	Colonoscopy N(%)	CRC Screening Adherence N(%)
Site				
Clinic 1	148 (24.5%)**	16 (2.6%)	132 (21.9%)	254 (42.1%)
Clinic 2	69 (16.7%)	6 (1.5%)	106 (25.7%)	164 (39.8%)
Age				
50–64	158 (21.8%)	14 (1.9%)	156 (21.5%)*	290 (40%)
65+	59 (20.3%)	8 (2.7%)	82 (28.2%)	128 (44%)
Gender				
Female	167 (24.4%)**	15 (2.2%)	162 (23.7%)	299 (43.7%)*
Male	50 (15.1%)	7 (2.1%)	76 (22.9%)	119 (35.8%)
Insurance Status				
None	21 (14.6%)**	1 (0.7%)	9 (6.3%)**	29 (20.1%)**
Public	169 (24.2%)	16 (2.3%)	185 (26.5%)	320 (45.8%)
Private	27 (15.5%)	5 (2.9%)	44 (25.3%)	69 (39.7%)
Continuity Index				
1 Visit	7 (8.4%)**	1 (1.2%)	7 (8.4%)**	13 (15.7%)**
Lower	153 (23.3%)	17 (2.6%)	163 (24.8%)	287 (43.6%)
Higher	57 (20.7%)	4 (1.5%)	68 (24.7%)	118 (42.9%)
Charlson-Deyo Comorbidity Score				
0	154 (21.4%)	14 (1.9%)	165 (22.9%)	289 (40.1%)
1	51 (23.2%)	6 (2.7%)	49 (22.3%)	95 (43.2%)
≥ 2	12 (15.8%)	2 (2.6%)	24 (31.6%)	34 (44.7%)
Primary Care Provider				
None	2 (11.1%)	0 (0%)	2 (11.1%)	3 (16.7%)*
MD	120 (20.6%)	17 (2.9%)	152 (26.1%)	251 (43.1%)
PA/ARNP	95 (22.8%)	5 (1.2%)	84 (20.2%)	164 (39.4%)
Language Concordant PCP				
None	2 (11.1%)	0 (0%)	2 (11.1%)	3 (16.7%)
No	115 (22.7%)	11 (2.2%)	124 (24.5%)	217 (42.9%)
Yes	100 (20.3%)	11 (2.2%)	112 (22.8%)	198 (40.2%)

* p = < 0.05,

** p = < 0.01;

ARNP = nurse practitioner; CRC = colorectal cancer; FOBT = fecal occult blood test; MD = physician; PA = physician assistant; PCP = primary care provider

Table 4

Multivariable Logistic Regression Analysis of Factors Associated with Colorectal Cancer Screening Adherence per US Preventive Services Task Force Guideline

	FOBT OR (95% CI)	CRC screening Adherence OR (95% CI)
Site		
Clinic 2	1.00	1.00
Clinic 1	0.74 (0.46, 1.19)	0.685 (0.46, 1.02)
Age		
50–64	1.00	1.00
65–75	0.90 (0.62, 1.29)	1.10 (0.82, 1.48)
Gender		
Male	1.00	1.00
Female	1.75 (1.21, 2.52)	1.56 (1.17, 2.09)
Insurance		
None	1.00	1.00
Public	1.99 (1.18, 3.37)	3.02 (1.92, 4.76)
Private	1.15 (0.60, 2.19)	2.76 (1.63, 4.67)
(Public vs. Private)	1.73 (1.08, 2.28)	1.10 (0.77, 1.57)
Continuity Index		
1 Visit	1.00	1.00
Lower	2.75 (1.19, 6.34)	3.22 (1.70, 6.12)
Higher	3.01 (1.27, 7.14)	3.62 (1.86, 7.05)
(Higher vs. Lower)	1.09 (0.74, 1.60)	1.12 (0.82, 1.54)
Charlson-Deyo Comorbidity Index		
0	1.00	1.00
1	1.02 (0.70, 1.49)	0.99 (0.72, 1.37)
≥ 2	0.71 (0.36, 1.39)	1.08 (0.65, 1.79)
Provider type and Language Concordance		
None	1.00	1.00
MD Language Concordant	2.85 (0.59, 13.65)	**4.39 (1.15, 16.73)**
MD Language Non-concordant	1.30 (0.28, 6.08)	3.64 (0.98, 13.49)
Non-MD Language Concordant	0.75 (0.16, 3.57)	1.90 (0.51, 7.08)
Non-MD Language Non-concordant	4.10 (0.87, 13.36)	**4.65 (1.23, 17.61)**

CRC = colorectal cancer; FOBT = fecal occult blood test; MD = physician