



Changes in Colorectal Adenomas: Secondary Analysis of Clinical Trial Data

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Introduction

Colorectal cancer is the third most common cancer in the United States among men and women combined. Colonoscopy has improved early detection of colorectal polyps before they develop into cancer, and several clinical trials have been conducted to test methods of colorectal cancer prevention by reducing polyp formation.

Purpose: Determine if there were significant changes in colorectal polyp characteristics across the baseline measurements of these three clinical trials over time.

Methods

This study is a secondary analysis of data collected from 4,320 participants from the WBF, UDCA, and SEL trials. Demographics, baseline measures of BMI, and measurements of the size and location of colorectal polyps were collected. Linear regression models and chi-square analyses were used to measure changes in polyp characteristics as measured by the number of adenomas present at the baseline colonoscopy, and the size and location of those adenomas, and the presence of multiple adenomas in the three trials.

Results

Our results indicate that there was a statistically significant difference in the characteristics of colorectal polyps across baseline measurements of the three clinical trials. The proportion of individuals with 3+ adenomas found at the time of baseline colonoscopy has statistically significantly increased over time, with a proportion of 12.2%, 13.9%, and 18.5% for WBF, UDCA, and SEL, respectively ($p < 0.0001$). Baseline adenoma size (mm) also differed significantly over time, with larger adenomas detected in WBF (8.3 ± 5.9) and UDCA (8.9 ± 5.9) as compared to SEL (7.8 ± 5.5 ; $p < 0.0001$). Adjustment for age and body mass index had no effect on the point estimates.

There have been significant changes in the characteristics of colorectal adenomas over the last twenty years, and these changes may be associated with changes in patient characteristics.

(WBF; recruitment years 1990-1995);
(UDCA; recruitment years 1995-1999);
(SEL; recruitment years 2001-2011)

Table 1. Baseline Characteristics of 4,320 Participants of Three Colorectal Cancer Prevention Clinical Trials between 1990 and 2011.

	Wheat Bran Fiber Trial N = 1304 1990 – 1995	Ursodeoxycholic Acid Trial N = 1192 1995 – 2000	Selenium Trial N = 1824 2001 – 2011
	M ± SD	M ± SD	M ± SD
Age in Years	65.7 ± 8.8	65.8 ± 8.5	62.9 ± 9.0
BMI	26.9 ± 4.3	27.6 ± 4.8	29.1 ± 5.1
Number of Baseline Adenomas	1.5 ± 0.9	1.7 ± 1.1	1.8 ± 1.3
Size of Baseline Adenomas	8.3 ± 5.9	8.9 ± 5.9	3.5 ± 4.8
	Yes (%)	Yes (%)	Yes (%)
Sex			
Male	871 (66.8)	805 (67.53)	1179 (64.64)
Female	433 (33.2)	387 (32.47)	645 (35.36)
Race			
White	1253 (96.1)	1108 (93)	1708 (94.3)
Black	10 (0.8)	8 (0.7)	55 (3.0)
Native America	41 (3.1)	76 (6.4)	0 (0)
Asian	0 (0)	0 (0)	19 (1.1)
Hispanic	0 (0)	0 (0)	3 (0.6)
Other	0 (0)	0 (0)	26 (2.7)
Adenoma Location			
Distal	498 (38.2)	347 (29.1)	979 (56.2)
Proximal	414 (31.8)	438 (36.7)	763 (43.8)
Other	392 (30.1)	407 (34.1)	0 (0)

Table 2. Linear Regression Predicting Changes in Characteristics of Colorectal Adenomas Across Baseline Measures of Three Clinical Trials between 1990 and 2011.

	β Coefficient	95% CI	p-value
Model 1: Adenoma Size (mm)			
Wheat Bran Fiber Trial	Reference	-	-
Ursodeoxycholic Acid Trial	0.6	0.2, 1.0	0.005
Selenium Trial	-4.8	-5.2, -4.4	<0.0001
Model 2: Number of Adenomas			
Wheat Bran Fiber Trial	Reference	-	-
Ursodeoxycholic Acid Trial	0.1	-0.03, 0.2	0.012
Selenium Trial	0.3	0.2, 0.4	<0.0001

Table 3. Chi-Square Comparing Frequencies of Multiple Occurrence of Adenomas and Locations of Adenomas Across Baseline Measures of Three Clinical Trials.

	Wheat Bran Fiber Trial N = 1304	Ursodeoxycholic Acid Trial N = 1192	Selenium Trial N = 1824	p-value
	N (%)	N (%)	N (%)	
Comparison 1:				
One Adenoma	855 (65.6)	709 (59.5)	1053 (57.7)	<0.0001
More than One Adenoma	449 (34.4)	483 (40.5)	711 (42.3)	
Comparison 2:				
Adenoma Location				<0.0001
Distal	610 (46.8)	444 (37.3)	979 (56.2)	
Other Sites	694 (53.2)	748 (62.8)	763 (43.8)	

Table 4. Logistic Regression Predicting Odds of Distal Adenomas Compared to Non-Distal Adenomas Across Baseline Measures of Three Clinical Trials between 1990 and 2011.

Predictors	Odds Ratio	Lower 95% CI	Upper 95% CI
Trial			
Wheat Bran Fiber Trial	Reference	-	-
Ursodeoxycholic Acid Trial	1.5	1.2	1.7
Selenium Trial	0.7	0.6	0.8
Body Mass Index	1.0	1.0	1.0
Race			
White	Reference	-	-
Black	1.8	1.1	2.9
Other	1.2	0.8	1.6
Age	1.0	1.0	1.0