

Commentary

Rural-urban difference in colorectal cancer mortality

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We read with great interest the recent study by Daniel et al., which showed a different response to knowledge and practice in relation to colorectal cancer screening between minority and majority populations in the deep south of the U.S. [1]. As Daniel et al. stated [1], rurality is a possible contributor to increased mortality in patients with colorectal cancer because several factors related to lifestyle, and socioeconomics and healthcare systems are associated with the diagnosis and clinical course of this disease. Thus, the study assumed the difference in responses to colorectal cancer screening between rural and urban residents – interestingly, however, few differences were found [1]. This might be an unexpected finding, as it is generally considered that rural-urban health inequity in cancer treatment is an issue that remains to be resolved.

Actually, what is the worldwide status of the rural-urban difference in colorectal cancer mortality, which is an ultimate outcome of screening? We performed a search of the PubMed database to identify original articles published prior to December 2020, with a population-based cohort design that reported the colorectal cancer mortality between rural and urban areas. The keywords were “rural[All Fields] OR urban[All Fields]) AND (“rectal neoplasms”[MeSH Terms] OR (“rectal”[All Fields]

AND “neoplasms”[All Fields]) OR “rectal neoplasms”[All Fields] OR (“rectum”[All Fields] AND “cancer”[All Fields]) OR “rectum cancer”[All Fields]) AND (“mortality”[Subheading] OR “mortality”[All Fields] OR “mortality”[MeSH Terms]) AND English[lang]. We obtained the hazard ratio or relative risk for cancer death between rural and urban areas, with adjustment for various co-variates.

In total, 143 English language articles were identified using the keywords. After evaluating the full text, five articles were finally eligible for the present review (Table 1) [2-6]. As a result, one study reported that the mortality risk was high in urban areas [2], while two studies reported that the mortality risk was high in rural areas [3, 5]. The remaining two studies reported no clear difference in risk between rural and urban areas [4, 6].

The results of the present review were therefore controversial; namely, a rural-urban difference in colorectal cancer mortality was not obviously proven. Of note, the present findings appear to be in line with the results reported by Daniel et al. [1]. While Daniel et al. hypothesized that rural residents often acknowledge a family history of cancer and cope with it well, more studies are warranted to clarify the detailed reasons for these findings.

Table 1. The hazard ratio or relative risk of colorectal cancer deaths between rural and urban areas

Study/Country [reference No.]	Cohort duration	Population (number)	Age (number)	Cancer type	Residence	Hazard ratio/relative risk (95% confidence interval)	Adjusted co-variables
Kassim, 2019/ China [6]	2007-2011	Male 143	54.96 years	Right colon	Urban	1.0 (reference)	Age, gender, smoking, drinking, residence, cancer grade, cancer stage, chemotherapy
		Female 91			Rural	1.082 (0.765-1.529)	
		Male 147	53.93 years	Left colon	Urban	1.0 (reference)	
		Female 94			Rural	1.151 (0.666-1.988)	
		Male 369	56.86 years	Rectum	Urban	1.0 (reference)	
		Female 234			Rural	0.934 (0.752-1.159)	

Study/Country [reference No.]	Cohort duration	Population (number)	Age (number)	Cancer type	Residence	Hazard ratio/relative risk (95% confidence interval)	Adjusted co-variables
Feller, 2018/ Swiss [5]	2000-2008	Male 5,700	< 50 years (668)	Colorectum	Urban	1.0 (reference)	Age, civil status, nationality, urbanity, residence, cancer localization, cancer stage, socioeconomic position
		Female 4,388	50-64 years (3,007) 65-74 years (3,180) 75-84 years (3,233)		Rural	1.15 (1.02-1.30)	
Hines, 2014/ United States [4]	2000-2012	Male 10,702	45-64 years (9,675)	Colorectum	Urban	1.0 (reference)	Age, gender, race, cancer stage, cancer grade, geography, treatment (surgery, chemotherapy or radiation), socioeconomic status
		Female 9,742	65-74 years (5,890) 75-85 years (4,879)		Rural	1.02 (0.94-1.12)	
Hines, 2012/ United States [3]	1992-2007	Male 7,365	Rural 68.4 years	Colon	Urban	1.0 (reference)	Age, gender, cancer stage, cancer grade, treatment (surgery or radiation)
		Female 7,809	Urban 65.8 years		Rural	1.15 (1.01-1.32)	
					Rectum	Urban Rural	
Vassallo, 1994/ Uruguay [2]	1988-1992	Male 1,121,250	< 55 years (1,664,150)	Colon	Urban	Male 1.50 (1.32-1.70)	Age, residence
		Female 1,209,700	55-64 years (316,450)		Rural	Female 1.17 (0.34-1.34)	
			65-74 years (209,500)			Male 1.0 (reference)	
			>75 years (140,850)			Female 1.0 (reference)	
				Rectum	Urban	Male 1.89 (1.51-2.35)	
					Rural	Female 1.35 (1.06-1.72) Male 1.0 (reference) Female 1.0 (reference)	

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