EUROPEAN JOURNAL OF CANCER 47 (2011) 1398–1406

available at www.sciencedirect.com

ScienceDirect

journal homepage: www.ejconline.com

Differences according to educational level in the management and survival of colorectal cancer in Sweden

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ARTICLE INFO

Article history:
Received 4 October 2010
Received in revised form 7 December 2010
Accepted 14 December 2010
Available online 13 January 2011

Keywords:
Colorectal cancer
Socioeconomic status
Education level
Management
Survival
Social gradients

ABSTRACT

Socioeconomic status (SES) affects survival after a cancer diagnosis. The extent to which differences in management can explain this is not known. Record-linkage between two Swedish Regional Clinical Quality Registers of colorectal cancer and a socio-economic database generated a dataset with information on diagnostic procedures, treatment and survival in patients of different educational background. Three thousand eight hundred and ninety-nine rectal cancer patients from the years 1995 to 2006 and 5715 colon cancer patients from 1997 to 2006 were evaluated. Compared to patients with high education, those with shorter education had poorer relative and overall survival (57.9% 5-year relative survival versus 63.8% in colon cancer, 58.7% versus 69.1% in rectal cancer). There were also differences in diagnostic activity with preoperative computer tomography (40% versus 47.3%) and colonoscopy (56.3% versus 62.8%) being more frequent in highly educated groups ($p = 0.001$ and 0.037, respectively). Surgery resulting in colostomy was performed in 26.9% of rectal cancer patients of high education compared to 35.5% of those with low education ($p = 0.005$). Although rectal cancer has poorer prognosis than colon cancer, it was noted that among the highly educated, rectal cancer patients had better survival than colon cancer patients (69.1% versus 63.8% 5-year relative survival). It thus appears that improved rectal cancer management has benefited mainly patients of middle and higher educational levels. We conclude that socioeconomic differences exist in diagnostic activity and management of colorectal cancer, which may affect survival.

1. Introduction

Studies conducted in a variety of settings have shown that cancer survival is better in individuals with high compared to low socioeconomic status (SES).[1–3] Possible explanations for these gradients include differences in comorbidity burden, life style and health awareness. In some studies marital status and patient's partner's level of education has influenced choice of, and adherence to, treatment.[4,5] Other investigators have reported associations between ethnic background and management and survival.[6] Also, variations in health care seeking behaviour and timing and stage at diagnosis may play a role.[7–9] To date, only few studies have explored possible socioeconomic differences in the management of cancer patients.[10–14]

While some research groups have not found socioeconomic variations in patterns of care and survival,[15,16] others have found differences also in countries with National Health

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0959-8049/$ - see front matter
doi:10.1016/j.ejca.2010.12.013

Table 1 – Patient characteristics.

	Colon cancer						Rectal cancer					
	Education level				Total	P-value[†]	Education level				Total	P-value[†]
	Low N = 2255	Middle N = 2182	High N = 1254	Missing N = 24	N = 5715		Low N = 1641	Middle N = 1460	High N = 775	Missing N = 23	N = 3899	
Gender (%)						0.688						0.631
Male	1172 (52.0)	1136 (52.1)	635 (50.6)	13 (54.2)	2956 (51.7)		989 (60.3)	865 (59.2)	475 (61.3)	17 (73.9)	2346 (60.2)	
Female	083 (48.0)	1046 (47.9)	619 (49.4)	11 (45.8)	2759 (48.3)		652 (39.7)	595 (40.8)	300 (38.7)	6 (26.1)	1553 (39.8)	
Age						<0.001						<0.001
Median (range)	68 (15–74)	64 (18–74)	62 (22–74)	68 (11–74)	65 (11–74)		67 (27–74)	63 (24–74)	62 (27–74)	67 (45–74)	65 (24–74)	
Mean (sd)	66.0 (7.3)	62.1 (9.7)	61.0 (9.6)	61.5 (17.4)	63.4 (9.1)		65.6 (7.1)	61.8 (9.1)	60.5 (9.1)	65.7 (8.6)	63.2 (8.6)	
Age (%)						<0.001						<0.001
0–54	168 (7.5)	413 (18.9)	296 (23.6)	4 (16.7)	881 (15.4)		135 (8.2)	297 (20.3)	185 (23.9)	3 (13.0)	620 (15.9)	
55–64	596 (26.4)	706 (32.4)	420 (33.5)	6 (25.0)	1728 (30.2)		458 (27.9)	500 (34.2)	288 (37.2)	5 (21.7)	1251 (32.1)	
65–74	1491 (66.1)	1063 (48.7)	538 (42.9)	14 (58.3)	3106 (54.3)		1048 (63.9)	663 (45.4)	302 (39.0)	15 (65.2)	2028 (52.0)	
Stage (%)						0.324						0.025
I	247 (11.0)	224 (10.3)	152 (12.1)	4 (16.7)	627 (11.0)		328 (20.0)	332 (22.7)	207 (26.7)	1 (4.3)	868 (22.3)	
II	784 (34.8)	751 (34.4)	400 (31.9)	6 (25.0)	1941 (34.0)		443 (27.0)	372 (25.5)	179 (23.1)	10 (43.5)	1004 (25.8)	
III	645 (28.6)	615 (28.2)	368 (29.3)	9 (37.5)	1637 (28.6)		452 (27.5)	422 (28.9)	210 (27.1)	3 (13.0)	1087 (27.9)	
IV	531 (23.5)	556 (25.5)	304 (24.2)	5 (20.8)	1396 (24.4)		336 (20.5)	273 (18.7)	143 (18.5)	6 (26.1)	758 (19.4)	
Missing	48 (2.1)	36 (1.6)	30 (2.4)	0 (0.0)	114 (2.0)		82 (5.0)	61 (4.2)	36 (4.6)	3 (13.0)	182 (4.7)	
Distance from anal verge (%)												0.032[a]
0–5 cm							513 (31.3)	441 (30.2)	219 (28.3)	12 (52.2)	1185 (30.4)	
5.01–10 cm							656 (40.0)	566 (38.8)	285 (36.8)	5 (21.7)	1512 (38.8)	
10.01–15 cm							444 (27.1)	428 (29.3)	260 (33.5)	6 (26.1)	1138 (29.2)	
>15 cm							4 (0.2)	4 (0.3)	2 (0.3)	0 (0.0)	10 (0.3)	
Missing							24 (1.5)	21 (1.4)	9 (1.2)	0 (0.0)	54 (1.4)	

[†] P-value for the hypothesis of no difference between the three education groups.

[a] Comparison when excluding >15 cm and missing.