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Elderly patients with colorectal cancer are oncologically undertreated

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Abstract

Aims: Colorectal cancer (CRC) is mainly a disease of the elderly. Our primary aim was to investigate if age had influence on treatment decisions in regards to surgery, referral to an oncologist and treatment by an oncologist.
Method: We identified patients with CRC in our department from 2004 through 2011 in the Danish Colorectal Cancer Group (DCCG) database. According to age ≤75 and >75 years multivariate logistic regression analysis was used on treatment decisions: surgery, referral to an oncologist and oncologic treatment. Independent variables were age, ASA score, tumorlocation, stage, gender and year of diagnosis. Additional analysis was performed for stage III and IV patients as a subgroup.
Results: 1701 patients were included of which 525 were >75 years of age. In multivariate analysis there was no association between age and chance of surgery. Older patients had a significantly lower odds ratio for referral to an oncologist (OR 0.624, $p < 0.0001$) and for oncological treatment if referred (OR 0.218, $p < 0.0001$). Being an elderly patient with stage III or IV CRC OR was 0.233 for referral- and for receiving treatment by an oncologist OR was 0.210 ($p < 0.0001$ for both), after adjusting for possible confounders.
Conclusion: Based on age elderly patients are on a lesser extent referred to an oncologist and get oncologic treatment less frequently. Surgically the elderly are not undertreated.

Keywords: Colorectal neoplasms; Medical oncology; Surgery; Aged; Referral and consultation; Multivariate analysis

Introduction

Colorectal cancer is the third most common cancer for both sexes and it is predominantly a disease of older adults. The population of patients older than 75 years is growing in our society[1] and therefore the prevalence of colorectal cancer in this group of patients is increasing. The mean age for patients with colorectal cancer is 71 years and 21% of the patients are older than 80 years.[2]

The group of elderly patients is very heterogeneous where some patients are doing very well while others have serious comorbidity, therefore it is a very difficult group to treat. Additionally many clinical trails exclude the elderly resulting in sparse data on how to treat this group optimally. The primary treatment for colorectal cancer is surgery and in some cases combined with neoadjuvant and/or adjuvant oncology.[3]

In the current European, American and Danish guidelines for colon and for rectal cancer age per se is not considered a risk factor when planning the treatment strategy for patients, though it is mentioned that individual modification for radio- and chemotherapy may be considered for the fragile and elderly patients.[3–5] Whether or not age does influence decisions on treatment is currently not a highly investigated topic.

The aim of this study was to analyse what kind of treatment patients with colorectal cancer older than 75 years of age were receiving in comparison to patients younger than 75 years. We used multivariate analysis to adjust for possible confounders. In addition to analysing data on all CRC patients we made separate analysis on stage III and IV patients were oncological treatment is highly indicated.

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Material and methods

Patients

All patients with CRC in Denmark are initially referred to and registered in the DCCG database by the surgical departments treating CRC. Patients with a first-time diagnosis of CRC referred to and treated in our centre between 1 January 2004 and 31 December 2011 were extracted from the DCCG database.

We divided our study population into two groups based on age with cutpoint at 75 years. Patient characteristics were examined including gender, location of the tumour, i.e colon or rectum, and UICC (Union of International Cancer Controle) stage. ASA score was used as expression for comorbidity, this being the data registered in the database. Three different therapeutic steps were identified; surgery, referral to an oncologist and initiated treatment by an oncologist. To adjust for a potential confounder of change in operative and oncological strategy we included year of diagnosis as a binomial variable in the multiple logistic regression analysis, i.e. 2004–2007 and 2008–2011. This also took into account that there was a change in organisation as the referral population increased in 2008 with 100,000 to some 400,000 inhabitants.

The database

Danish Colorectal Cancer Group (DCCG), maintains a national clinical database containing data on all patients diagnosed in Denmark with a first-time diagnose of colorectal adenocarcinoma. All data are prospectively collected. The database has a patient completeness exceeding 99% and is approved by the Danish Data Protection Agency.[3]

Statistics

Categorical data were presented as frequencies and percentages and compared by Fisher's exact test and Pearson's Chi-square test when appropriate. The three therapeutic steps were analysed using multivariate logistic regression analysis with the independent variables; age, ASA score, cancer location, UICC stage, gender, and year of treatment (2004–2007 vs. 2008–2011). Univariate as well as multivariate logistic regression analysis were also preformed on referral to an oncologist and receiving treatment by an oncologist for UICC stage III and IV patients because this group was the most likely to receive oncological treatment. All statistical analyses were preformed using Predictive Analytics Software Statistics Version 20 (SPSS Inc.; Chicago, IL). Statistical significance was set at $p < 0.05$.

Ethical approval

Using data from the DCCG database is approved in general from The Danish Ethical Committee. All procedures used were well-established and commonly used in our department prior to the study and in accordance with national guidelines as standard treatments. Additional approval from ethical committees was not indicated as this database study did not involve direct patient contact and no biological samples were collected.

Results

The study population consisted of 1701 patients treated for colorectal cancer at Roskilde hospital between 2004 and 2011. The younger group consisted of 1176 patients all ≤75 years of age while the older group consisted of 525 patients >75 years of age. The median age was 66 for the younger group (range 22–75) and 81 for the older group (range 76–98). Table 1 summarises the demographic characteristics, preoperative comorbidity, the UICC staging of the patients and therapeutic decisions. In the categories; gender, location, year of diagnose, surgery, referral to an oncologist and oncological treatment there were no missing data.

Using a multivariate logistic regression analysis the factors associated with being surgically treated, being referred to an oncologist for evaluation, and receiving treatment by an oncologist were analysed. Surgical treatment was not statistical significantly associated with age after adjusting for ASA score, location, gender, year of diagnosis, and UICC stage. Being referred to an oncologist for evaluation and being treated by an oncologist was highly statistical

Table 1
Demographic characteristics, preoperative comorbidity, UICC staging and therapeutic decisions.

		Age ≤ 75, n/%	Age >75, n/%	P
Gender	Women	485 (41.2)	272 (51.8)	<0.0001[a]
	Men	691 (58.8)	253 (48.2)	
ASA score	ASA 1 + 2	925 (78.7)	276 (52.6)	<0.0001[b]
	ASA 3+	224 (19.0)	212 (40.4)	
	Missing	27 (2.3)	37 (7.0)	
Location	Rectum	436 (37.1)	149 (28.4)	0.0005[a]
	Colon	740 (62.9)	376 (71.6)	
Year of diagnose	2004–2007	455 (38.7)	177 (33.7)	NS[a]
	2008–2011	721 (61.3)	348 (66.3)	
UICC staging	I	180 (15.3)	63 (12.0)	<0.0001[b]
	II	328 (27.9)	162 (30.9)	
	III	318 (27.1)	124 (23.6)	
	IV	326 (27.7)	133 (25.3)	
	Missing	24 (2.0)	43 (8.2)	
Surgery	Yes	1060 (90.1)	438 (83.4)	<0.0001[a]
	No	116 (9.9)	87 (16.6)	
Referral to an oncologist	Yes	697 (59.3)	168 (32.0)	<0.0001[a]
	No	479 (40.7)	357 (68.0)	
Oncologic treatment[c]	Yes	624 (89.5)	110 (65.5)	<0.0001[a]
	No	73 (10.5)	58 (34.5)	

[a] Fischer's exact test.
[b] Pearson's Chi–Square test.
[c] Only patients that were sent to the oncologist were included.