

ORIGINAL

Predictors of quality of life in colorectal cancer patients treated with curative intention

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ABSTRACT

This study aims to evaluate predictors of quality of life in patients treated for colorectal cancer (CRC) with curative intention. **Patient/Methods:** All patients with CRC treated with curative intention were interviewed by telephone using the SF-36 questionnaire. **Results/Findings:** One hundred and one patients (44 men, 57 women) were included in this study with a mean age of 60.8 years. Sixty-nine patients were treated for rectal cancer and 32 for colon cancer. Of the total, 23 patients had a stoma (22.8%) and 55 (54.5%) reported comorbidities. The means of the SF-36 scales varied between 90 (emotional aspects) and 65 (physical aspects). Presence of comorbidities was a predictor factor of quality of life in six of eight SF-36 scales. The female patients attained lower scores on three scales: *functional capacity*, *pain* and *vitality*. Patients age 60 or over attained lower scores on two SF-36 scales: *functional capacity* and *social aspects*. Patients with a stoma had lower score on *limitation due to emotional aspects*. We concluded that comorbidities affect the quality of life of individuals with colorectal cancer. Health professionals should be prepared to address not only the limitations caused by cancer and its treatment, but also the limitations caused by chronic diseases.

Keywords: alcoholics, hospitals, incidence, neoplasms, university.

INTRODUCTION

It is estimated that in Brazil, for the year 2010, 28,100 new cases of colorectal cancer will be diagnosed¹. Colorectal cancer has an important impact on quality of life of individuals affected by the disease, compromising the physical, emotional, social and spiritual well-being.

Hürny and Bernard² point to a series of problems that affect the quality of life of patients with cancer of the gastrointestinal tract. Besides the need to adjust to an illness that threatens life perspective, patient and family face symptoms of anorexia, nausea, vomiting, abdominal discomfort, diarrhea and constipation. Patients who have undergone an abdominoperineal amputation of the rectum must adapt to a permanent colostomy. Even patients undergoing surgery with sphincter sparing must adapt to a situation in which defecation urgency, incontinence and increased bowel movements may be present.

Thus, it is important to assess quality of life (QOL) since traditional clinical measures are of limited use, and HRQL (health-related quality of life) measures the im-

pact of disease and treatment according to the patient's perspective.

Therefore, evaluation of quality of life can identify groups of patients who benefit from behavioral and psycho-pharmacological interventions, appraise the quality of the care, aid in adaptation to the disease and its treatment, evaluate the effectiveness of the interventions and facilitate rehabilitation^{3,4}.

In the literature, the assessment of quality of life in patients with colorectal cancer led to the identification of predictive factors, among those sociodemographic factors (age, gender, income)⁵⁻⁹ related to treatment (type of surgery and stoma)¹⁰⁻¹², and other factors, such as the presence comorbidities^{13,14}.

It is important to evaluate a group of patients with colorectal cancer treated with curative intent to identify subgroups that may benefit from educational and psychosocial interventions.

This study was carried out with the aim to identify predictors of quality of life in patients treated with CRC with curative intention.

MATERIAL AND METHODS

A cross-sectional study was carried out on patients with CRC in the Pelvic Surgery Department of Hospital A.C. Camargo (São Paulo, Brazil) who had concluded treatment with curative intention from two years to five years and were found free of the disease at the moment

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of the interview. The following groups of patients were excluded: under age 18, persons with demential syndromes and/or conditions that might reduce their capacity to understand and answer the questionnaires, persons with a second primary tumor, those without possibility of telephone contact, and persons living outside the São Paulo metropolitan region.

After approval of the study by the ethics and research committee (the study has therefore been performed in accordance with ethical standards laid down in the 1964 Declaration of Helsinki), the patients were contacted through a letter of invitation, followed by a telephone call for clarification about the objectives and procedures of the study. Each patient received two copies of the Informed Consent by mail, to be signed and returned. Interviews were held during the same telephone contact or scheduled for a call at a later time. During the interviews, questionnaires were applied to evaluate sociodemographic characteristics, as well the Medical Outcomes 36-Item Short-Form General Health Survey (SF-36)^{15,16}.

The SF-36 is a generic questionnaire to evaluate the health-related quality of life. Its structure contains 36 items, eight scales that evaluate eight domains and two grouped measurements. Of the total, 35 items make up the domains of the SF-36: *physical functioning*, *role-physical*, *bodily pain*, *general health*, *vitality*, *social functioning*, *role-emotional* and *mental health*. One question, which is not included in the scales, asks the individuals to compare their current health with their health in the preceding year. This item is useful for estimating to what degree their health has changed during the year preceding the interview¹⁵. The SF-36 became available in experimental format in 1988. Version 1 was released in 1990 and validated in Brazil by Ciconelli et al.¹⁶.

Statistical analysis

Suitability of the instruments to measure quality of life

The suitability, for this sample, of the internal consistency of the scales on the instruments was verified through Chronbach's Alpha Coefficient (and KR-20 for the *role-physical* and *role-emotional* scales of the SF-36).

All scales on the SF-36 showed Chronbach Alphas above 0.70, the highest coefficient being on the *physical function* scale (0.86) and the lowest being the *social functioning* scale (0.71).

Relationships among the dependent and independent variables

The means of the scales on the SF-36 were considered dependent variables; the sociodemographic, clinical and therapeutic characteristics were considered indepen-

dent variables. The hypothesis of normal distribution of the scores on the scales, required in order to use the parametric tests, was verified with the Kolmogorov-Smirnov test. The majority of the scales on the three instruments presented significance levels below 5%. That is, they rejected the hypothesis of normality, indicating an option for the use of non-parametric tests.

Two stages were used to evaluate the influence of the independent variables on quality of life: 1) Testing of averages to determine which independent variables were related to the scores on the scales, considering a significant difference of 5% or lower (Mann-Whitney Test for independent variables with two categories and Kruskal-Wallis Test for variables with three or more categories); 2) After determining the independent variables that influenced the average for each scale, a multiple linear regression was carried out using an equation that expressed the linear relationship between one dependent variable (scales on the instruments) and two or more independent variables (sociodemographic, clinical and therapeutic characteristics). To analyze the best regression equation for the scales, the multiple determination coefficient (R^2), which represents the proportion of total variation explained by the model and statistical significance, were considered. A perfect adjustment results in R^2 equal to one, and a weak adjustment brings about a value of R^2 near zero. A significance value of the model below 0.05 suggests that the equation is adequate for predicting the averages on the scales of the instruments related to quality of life, on the basis of the independent variables.

RESULTS

During the period evaluated, 787 CRC patients were seen; 166 (21%) of whom were treated with palliative intention and 19 not operated (2.4%). Of the 602 patients treated with intention to cure, 495 were excluded for the following reasons: cancer treatment in another institution (151), death (123), no information on follow-up (90), living outside the São Paulo metropolitan region (53), second primary tumor (23), not in clinical condition to respond to the interview (20) and disease recurrence (19). A total of 107 patients were selected, but six refused. Thus, the final sample consisted of 101 patients.

The mean age of the 101 patients interviewed was 60.8 years (standard deviation = 12; median = 63.5; variation from 33 to 87). The most common comorbidities were arterial hypertension ($n = 32$; 58.2%), diabetes ($n = 11$; 20%), hypothyroidism ($n = 8$), gastrointestinal problems ($n = 6$), treatment for depression ($n = 4$), and other psychiatric disorders ($n = 2$: panic syndrome and bipolar disorder). The sociodemographic characteristics are found in Table 1 and the clinical and therapeutic characteristics in Table 2.

Table 1. Sociodemographic characteristics of the 101 patients treated for colorectal cancer.

Characteristic	N	%
Age		
< 60	44	43.6
= or > 60	57	56.4
Gender		
Female	59	58.4
Male	42	41.5
Color		
White	83	82.2
Non-white	18	17.8
Formal education		
Elementary (1-4 years)	48	47.5
Secondary (5-11 years)	20	19.8
High school/college	33	32.7
Current occupation		
Working	80	79.2
Not working	21	20.8
Income*		
< 9 Times Minimum Monthly Wage	50	49.5
10 Times or More Minimum Monthly Wages	32	31.7
Marital status		
Single/Widow(er)/Separated/Divorced	35	34.7
Married	66	65.3
Children		
No	11	10.9
Yes	90	89.1

* 19 patients were unable to inform family income.

The patients mentioned greater limitations due to physical aspects than to emotional aspects. The means from the SF-36 are presented in Table 3.

In the multiple analysis, the proportion of the explained variation (R^2) was modest on most of the scales, but all models were statistically significant (Table 4). Presence of comorbidities was a predictor factor of lower quality of life in six of eight SF-36 scales. The female patients attained lower scores on three scales: *physical functioning*, *bodily pain* and *vitality*. Patients age 60 or over attained lower scores on two SF-36 scales: *physical functioning* and *social functioning*. Patients with a stoma had lower score on the *role-emotional* scale.

Of variables related to the disease and treatment, two were predictive of quality of life: patients with colon tumor reported better mental health than patients with rectal tumors, and patients with stoma reported greater limitations due to emotional aspects of patients without stoma.

Table 2. Clinical and therapeutic characteristics of the 101 patients treated for colorectal cancer.

Characteristic	N	%
Tumor location		
Colon	32	31.7
Rectum	69	68.3
Stage*		
I	33	32.7
II	39	38.6
III	26	25.7
Neo-adjuvance**		
No	45	65.2
Yes	24	34.8
Surgery***		
Colectomy	21	20.8
AR	49	48.5
APA/Hartmann	11	10.9
Others (Expanded/Exenteration/TPC)	20	19.8
Presence of stoma		
No	78	77.2
Yes	23	22.8
Adjuvance		
No	47	46.5
Yes	54	53.5
Comorbidities		
No	46	45.5
Yes	55	54.5

* Three patients in unknown stage; ** Only 69 cases of rectal tumors were taken into consideration; *** AR: Anterior Resection of rectum; APA: Abdominoperineal Amputation; TPC: Total Proctocolectomy.

Table 3. Mean and standard deviation of the scales on the SF-36 of patients treated for colorectal cancer.

SF-36 Scales	Mean	Standard deviation
Physical functioning	72	23
Role-physical	65	35
Role-emotional	90	25
Social Functioning	76	28
Bodily Pain	74	30
Vitality	71	19
Mental Health	69	20
General Health	73	20

DISCUSSION

Assessment of predictors of quality of life in survivors of colorectal cancer enables the identification of subgroups of individuals who benefit from interventions

Table 4. Scales on the SF-36 and sociodemographic clinical and therapeutic variables that influenced the averages on the scales, according to multiple linear regression.

Scale	R2	Variable	β Coefficient	<i>p</i>
Physical functioning	0.337	Comorbidities: yes	-0.267	0.003
		Education: elementary	-0.231	0.009
		Color: non-white	-0.224	0.008
		Gender: female	-0.219	0.014
		Age: > 60 years old	-0.215	0.014
Role-physical	0.137	Income: more than 9 minimum wages	0.248	0.021
		Comorbidities: yes	-0.271	0.012
Role-emotional	0.041	Stoma: yes	-0.225	0.024
Bodily pain	0.103	Income: more than 9 minimum wages	0.170	0.118
		Gender: female	-0.280	0.011
Vitality	0.150	Comorbidities	-0.273	0.005
		Gender: female	-0.239	0.015
Social functioning	0.118	Age: > 60 years old	-0.259	0.007
		Comorbidities	-0.239	0.015
Mental health	0.200	Comorbidities: yes	-0.228	0.034
		Tumor location: colon	0.218	0.040
		Civil status: married	0.155	0.160
		Income: more than 9 minimum wages	0.174	0.119
		Income: more than 9 minimum wages	0.263	0.010
General health	0.280	Comorbidities: yes	-0.262	0.013
		Color: non-white	-0.253	0.013
		Stoma: yes	-0.145	0.153
		Adjuvancy: yes	0.171	0.094

aiming the rehabilitation. What was observed in this study was that demographic and comorbidities were associated with quality of life and variables related to treatment (except for the presence of a stoma and tumor location) were not predictors of quality of life in patients that concluded treatment between two to five years.

Trentham-Dietz et al.¹³ evaluated the quality of life of women with CRC and concluded that, in survivors, the initial diagnosis of cancer seems not to affect the quality of life when compared with the influence of comorbidities. Ramsey et al.¹⁴ in a study of 227 CRC patients outside treatment (five years or more), also failed to note differences regarding the time of diagnosis or stage.

To the extent that there is an aging population, the incidence of cancer and other chronic diseases increases, which requires managing care in the context of multiple diseases. This raises the need for health care professionals to act in the prevention and management of other chronic conditions such as obesity, hypertension and depression.

Yancik et al.¹⁷ demonstrated that comorbidity is an independent predictor of mortality in survivors of breast cancer. Mao et al.¹⁸ observed that individuals with comorbidity had higher symptom burden.

Elliott et al.¹⁹ observed that evaluations of the quality of life are reflections not only of the cancer but also of all the chronic diseases the patient suffers from. Therefore, instruments that evaluate the quality of life, be they generic or specific, reflect the symptoms of the main disease of interest as well as of other associated conditions.

Patients over age 60 had more physical limitations than the younger subjects, but this fact was not seen in the scales dealing with emotional aspects. The decline in physical function with the contrasting maintenance of emotional function in the older subjects is a phenomenon also seen in other studies²⁰. Singer et al.²¹ and Michelson et al.²² suggest a process of psychological adjustment: the physical function becomes progressively limited while mental health is maintained.

According to Rowland and Yancik²³, age is an important predictor of functional decline and presence of comorbidities. Understanding the contribution of comorbidities on quality of life in cancer patients is critical to reduce the social burden of cancer.

The women treated for CRC reported worse quality of life than the men regarding physical function, pain and vitality. In the study by Mosconi et al.⁹, who used the EORTC QLQ-C30, male gender was associated with better quality of life on the scales of *physical function*, *emotional function*, *role performance*, *general health/quality of life*, *fatigue* and *pain*. In a study comparing the quality of life of 264 men and 255 women with rectal cancer, Schmidt et al.⁸ found that females had a lower quality of life in the domains of physical function and general health status. Fleishman and Lawrence²⁴ suggest that the difference between the genders might be attributed to the posture taken by the male patients, who may avoid responses that hint at weakness or dependence.

In this study, income was a predictor for the role-physical as well as general health status. Education was a predictor for physical function. Some studies identified an association between socioeconomic variables and quality of life. In a study of childhood cancer survivors, Zelter et al.²⁵ observed that low income was associated with worse scores on the SF-36 in all scales assessed. Knight et al.²⁶ in a study of patients with prostate cancer identified that individuals with low educational level have a worse quality of life, whereas this is a vulnerable population and should

receive special attention from health care professionals. Ramsey et al.²⁷ evaluated colorectal cancer survivors and noted that low income status was associated with worse pain, and emotional and social well-being.

Although the presence of stoma does not cause physical repercussions, it causes psychological effects, which suggests that these patients need psychosocial support after treatment.

This study has limitations. It is a cross-sectional study, therefore, it is not possible to determine the quality of life during treatment, and we are also unable to evaluate the quality of life before diagnosis.

We conclude that comorbidities affect the quality of life of individuals with colorectal cancer. Health professionals should be prepared to address not only the limitations caused by cancer and its treatment, but also the limitations caused by chronic diseases.

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