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Colorectal cancer in the elderly: characteristics and short term results

Juan José Arenal Vera¹, Claudia Tinoco Carrasco¹, Araceli del Villar Negro²,
Fernando Labarga Rodríguez¹, Alberto Delgado Mucientes¹ and Miguel Ángel Cítores¹

Departments of ¹Surgery and ²Pathology. Hospital Universitario Río Hortega. Valladolid, Spain

ABSTRACT

Objective: to analyse the characteristics of colorectal cancer in elderly patients and to assess the outcomes of treatment.

Materials and methods: the study included 1924 patients diagnosed with colorectal cancer during a 22 year period (1985-2007). We analysed patient clinical and demographic characteristics as well as their treatment and its outcome.

Results: there was an increase in emergency surgery with age, increasing from 13% among patients under 80 years of age to 47% in those over 90 years of age ($p = 0.0001$). On the other hand, the overall percentage of patients who underwent surgical treatment decreased from 96% in patients younger than 80 years of age, to 85% and 59% in octogenarians and nonagenarians, respectively ($p = 0.0001$), and there was a similar pattern in the rates of curative surgery among patients who underwent surgery. The overall mortality of patients who underwent surgery was 8% (141 out of 1,769), increasing from 4% in patients younger than 70 years of age to 25% in those over 90 ($p = 0.0001$). Multivariate analysis showed that the factors associated with mortality were the emergency nature of the surgery ($p = 0.001$), the ASA grade ($p = 0.0001$), and the presence of systemic complications ($p = 0.0001$), the weight of age decreasing significantly with respect to the univariate analysis ($p = 0.013$).

Conclusions: there is an increase in the rate of complicated forms of colorectal cancer with increasing age of patients. In addition, there is a dramatic decrease in the rate of curative tumour resection with increasing age. Intraoperative mortality for colorectal cancer in octogenarians and nonagenarians is more closely related to the nature and intent of the surgery (elective or emergency; palliative or curative), the perioperative risk (ASA grade), and severe systemic complications, than to age.

Key words: Colorectal cancer. Octogenarians. Nonagenarians. Mortality.

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INTRODUCTION

In 2000, colorectal cancer caused 11% and 15% of deaths due to cancer in men and women, respectively in Spain (1). Cancer is a common disease in octogenarians and nonagenarians and is currently a healthcare problem of great importance. In particular, colorectal cancer represents more than 50% of the new cases of cancer in nonagenarians. Nevertheless, there are few of publications focusing on this disease in octogenarians, and hardly any relating to patients older than 90 years of age (2-6). Indeed, there is little in literature concerning the impact of surgery in general on octogenarians and nonagenarians (7-12).

Specialists have to deal with certain challenges when it comes to deciding treatment for older patients with colorectal cancer. In particular, typically there is a great variability in ageing between individuals, so that there is no often correlation between chronological and biological age. Patients of the same age may have no associated disorders, with a good level of physical activity and a long life expectancy, or, on the other hand, have multiple associated disorders and be very weak due to severe functional impairments (heart, bronchopulmonary, renal and cerebrovascular disorders).

Surgical standards have improved in recent years, but we have to bear in mind comorbidities when taking decisions concerning weak patients. Although high rates of mortality and a decrease in the overall survival have been reported for elderly patients, compared to their younger counterparts, careful selection should help us identify patients who may benefit from major surgery.

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Correspondence: Juan José Arenal Vera. Department of Surgery. Hospital Universitario Río Hortega. C/ C/ Dulzaina, nº 2. 47012 Valladolid.
e-mail: jujoarve@yahoo.com

The aim of this study was to assess the treatment of colorectal cancer in octogenarian and nonagenarian patients and to improve our understanding of the short term outcomes of major surgery in these types of patients.

MATERIAL AND METHODS

The cohort was composed of 1924 patients diagnosed with colorectal cancer over a period of 22 years (1985-2007). The series was divided into four age groups: < 70 (791 cases), 70-79 (627 cases), 80-89 (429 cases) and $\geq$ 90 (74 cases) years of age. The variables analysed were: a) demographic characteristics; b) the nature and intent of the main operation, namely, whether it was an elective or an emergency procedure and the curative or palliative intention of the surgery; c) immediate operative outcomes, in terms of morbidity (local and systemic morbidity); and d) pathological characteristics: diagnosis, tumour differentiation, length and width of the tumour, infiltration of the intestinal wall and of other tissues, number of lymph nodes found and number invaded in resected tissue, vascular and perineural invasion, synchronous lesions, involvement of surgical margins, distance from the anus in rectal cancer cases, size of disease free margins (from tumour to the edge of the resected tissue), and presence of residual tumour after surgery. The cancer was staged using the TNM cancer staging system and the perioperative risk associated with anaesthesia was assessed using the ASA (American Society of Anesthesiologists) criteria.

Statistical analysis

For continuous variables, the Kolmogorov-Smirnov test was used to compare groups, means (and standard deviations) were calculated to analyse distributions, and differences between parametric variables were assessed using the paired and the unpaired Student's t-tests, while non-parametric variables were assessed using Friedman, Wilcoxon, K Kruskal and U-Mann tests. The differences between qualitative variables were analysed using the Chi square test with Yates correction and Fisher's exact test. A multiple regression analysis was performed to determine the weight of the variables found to be related to mortality in the univariate analysis. Age was not introduced as continuous variable, but rather as the defining characteristic for the four groups analysed. Similarly, the variables related to local and systemic complications were analysed as dichotomous variables (yes/no). Only p values < 0.01 were considered to be significant.

RESULTS

The characteristics of patients with colorectal cancer in our series are shown in table I. Slightly over half (58%) of

Table I. Demographic characteristic of the patients with colorectal cancer

	Number	%
Sex		
Men	1121	58
Women	803	42
Age		
< 70	792	41
70-79	629	33
80-89	429	22
$\geq$ 90	74	4
All ages	1924	100

the patients were men and the median of age of the series was 72 years (range 23-99). A total of 60% of the patients were 70 years old or older, while 26% of the patients were 80 or older.

Table II describes the distribution of the variables studied as a function of different age groups. We observed an increase in female patients with increasing age, women representing 61% of the group aged 90 or over ($p = 0.0001$). There was an increase in the rate of emergency surgery from the age of 80 onwards, ranging from 13% in those younger than 80 years old to 47% among those older than 90 ($p = 0.0001$, 3df, $\chi^2 = 63.98$). That is, the rate of emergency surgery with respect to the younger patients doubled in those over the age of 80, and trebled for those over the age of 90 ($p = 0.0001$). There was also a progressive increase in patients with associated diseases as a function of age. A total of 66% of the patients younger than 70 years old did not have any associated diseases, compared to rates of associated diseases of 38%, 36% and 31% among those 70-79, 80-89 and 90 or more years of age, respectively ($p = 0.0001$). In particular, cases of diabetes, high blood pressure, chronic bronchopulmonary disease, and heart disease significantly increased with age. A total of 72% of patients younger than 70 years of age were classed as ASA I-II compared to 54%, 43% and 33% in the groups aged 70-79, 80-89 and 90 and over, respectively ($p = 0.0001$). In parallel with this fall, there was a progressive increase in the percentage of ASA IV and V patients. With increasing age, there were more cases of cancer of the right colon and a progressive decrease in rectal cancer ($p = 0.0001$), though there were no significant differences between the age groups with respect to the cancer of the left colon. From the age of eighty onwards the percentage of patients with stage I cancer fell, from 14% to 7% among those 80-89 years old and further to 4% among those aged 90 or over. The percentage of patients not staged was just 3% for the group younger than 70, rising to 6% for the 70- to 79-year-olds, 18% for 80- to 89-year-olds and 45% among those aged 90 years and over ($p = 0.0001$).

The mean time from the onset of symptoms to seeking medical attention was 3.95 months for the overall series,

Table II. Comparative analysis of the series as a function of age group

	< 70 Cases (%)	70-79 Cases (%)	80-89 Cases (%)	≥ 90 Cases (%)	Chi ²
Sex					p = 0.0001, 3df, χ^2 = 26.73
Men	490 (62)	383 (61)	219 (51)	29 (39)	
Women	301 (38)	244 (39)	210 (49)	45 (61)	
Nature of the surgery					p = 0.0001, 3df, χ^2 = 63.98
Elective	673 (87)	530 (87)	308 (77)	33 (53)	
Emergency	102 (13)	81 (13)	91 (23)	29 (47)	
Number of associated diseases					p = 0.0001, 6df, χ^2 = 170.31
None	518 (66)	240 (38)	156 (36)	23 (31)	
One	192 (24)	240 (38)	149 (35)	24 (32)	
Two or more	81 (10)	147 (24)	124 (29)	27 (37)	
Associated diseases					
Diabetes	50 (6)	84 (13)	55 (13)	16 (21)	p = 0.0001, 3df, χ^2 = 31.93
HBP	122 (15)	178 (28)	142 (33)	29 (39)	p = 0.0001, 3df, χ^2 = 66.02
COPD	57 (7)	85 (13)	54 (12)	5 (7)	p = 0.0004, 3df, χ^2 = 18.44
Heart disease	54 (7)	115 (18)	123 (29)	21 (28)	p = 0.0001, 3df, χ^2 = 110.03
Renal failure	5 (1)	7 (1)	11 (3)	6 (8)	NS
Cerebrovascular diseases	17 (2)	34 (5)	31 (7)	8 (11)	NS
Others	59 (7)	53 (8)	28 (6)	5 (7)	NS
ASA grade					p = 0.0001, 12df, χ^2 = 282.31
ASA I	324 (41)	127 (20)	56 (13)	2 (3)	
ASA II	246 (31)	210 (34)	130 (30)	21 (30)	
ASA III	156 (20)	193 (32)	134 (32)	25 (35)	
ASA IV	56 (8)	89 (14)	101 (24)	17 (24)	
ASA V	1 (0)	1 (0)	3 (1)	6 (8)	
Location of the tumour					p = 0.0018, 6df, χ^2 = 21.02
Right colon	163 (21)	150 (24)	122 (28)	24 (32)	
Left colon	307 (39)	252 (40)	176 (41)	32 (43)	
Rectum	321 (40)	226 (36)	131 (31)	18 (24)	
Stage of the tumour					p = 0.0001, 9df, χ^2 = 74.51
I	111 (14)	87 (14)	30 (7)	3 (4)	
II	262 (34)	212 (34)	137 (32)	19 (26)	
III	200 (26)	158 (25)	98 (23)	6 (8)	
IV	187 (24)	131 (21)	82 (19)	12 (16)	
Not determined	22 (3)	38 (6)	78 (18)	33 (45)	

HBP: high blood pressure; COPD: chronic obstructive pulmonary disease.

being 4.10, 3.96, 3.78 and 3.02 months for the ≤ 70, 70-79, 80-89 and ≥ 90 year old groups respectively (NS).

Table III shows the comparative analysis of the main symptoms of colorectal cancer, distributed by age groups. The symptoms which became the most common with increasing age were pain, anaemia, and intestinal occlusion, while rectal bleeding and tenesmus decreased with age.

Table IV lists the rates of surgery by age group. Notably, both the total rate of surgery and that of resection dramatically decrease from the age of 80 onwards. Among those who underwent surgery, the rate of surgery with intention to cure was 80%, 79%, 74% and 66% for the ≤ 70, 70-79, 80-89, and ≥ 90 year old age groups (p = 0.0095).

The mortality analysis for the series is shown in Table V. Overall mortality of patients who underwent surgery was 8% (141 out of 1769), increasing from 4% in the ≤ 70 age

group to 25% in the ≥ 90 year old age group. In the univariate analysis, as well as age, the nature of the surgery (elective or emergency, p = 0.0001), its intent (curative or palliative, p = 0.0001), the ASA grade (p = 0.0001) and the occurrence of systemic complications were found to be significantly associated with the increase of mortality.

Table VI indicates that there we found no significant differences in mortality among patients who were biologically strong (ASA I-II) as a function of age group.

Indeed, logistic regression analysis (Table VII) showed that the factors related to postoperative mortality were emergency surgery (p = 0.001), ASA grade (p = 0.0001) and the occurrence of systemic complications (p = 0.0001).

Morbidity in patients who underwent surgery is reported by age group in Table VIII. A total of 35% of these patients ≤ 70 years of age had no postoperative complications, com-

Table III. Symptomatology by age group

	< 70 Cases (%)	70-79 Cases (%)	80-89 Cases (%)	≥ 90 Cases (%)	Chi ²
Rectal bleeding	375 (47)	295 (47)	147 (34)	14 (19)	p = 0.0001
Pain	323 (40)	229 (36)	176 (41)	37 (50)	p = 0.08
Change of intestinal habit	229 (29)	186 (30)	109 (25)	17 (23)	p = 0.32
Anaemia	150 (19)	173 (28)	148 (35)	31 (42)	p = 0.0001
Diarrhoea	111 (14)	88 (14)	48 (11)	10 (14)	p = 0.52
Tenesmus	113 (14)	62 (10)	31 (7)	3 (4)	p = 0.0002
Occlusion	89 (11)	71 (11)	82 (19)	30 (41)	p = 0.0001
Sub-occlusion	37 (5)	30 (5)	27 (6)	3 (4)	p = 0.60
Melaena	39 (5)	37 (7)	26 (6)	2 (3)	p = 0.56
Asthenia	122 (15)	163 (26)	104 (24)	11 (15)	p = 0.0001
Anorexia	118 (15)	151 (24)	98 (23)	13 (18)	p = 0.0003
Weight loss	160 (20)	175 (28)	107 (25)	14 (19)	p = 0.0056
Asymptomatic	21 (3)	11 (2)	6 (1)	1 (1)	p = 0.56

pared to 41%, 47% and 50% of those in the 70-79, 80-89 and ≥ 90 year old age groups ($p = 0.001$). Differences in rates between the four age groups were not significant with regards to local complications, but were significant for systemic complications, the rates being 13%, 19%, 28% and 30% for the ≤ 70, 70-79, 80-89 and ≥ 90 year old age groups, respectively ($p = 0.0001$). This increase of systemic complications was found to be due to increases in cardiac, respiratory and renal complications with age.

The average postoperative stays in hospital for patients who underwent surgery were 16.3 (SD 10.4), 17.2 (SD 12.2), 16.6 (SD 9.6), and 15.4 (SD 10.3) days for the ≤ 70, 70-79, 80-89 and ≥ 90 year old age groups, respectively (NS).

DISCUSSION

In our series, 59% of the patients were over 70 years old, and 26% were 80 years old or more. These figures are consistent with data from other series of colorectal cancer patients, in which the percentage of patients over 75 years of age ranges between 22% and 45% (5,14). The increase of female patients as a function of age is also found in other series and is explained by the higher life expectancy of women (15). As has been described previously (5,16-20),

more than 60% of patients aged 80 or older had associated comorbidities. Similarly, there was an increase in perioperative risk (ASA grade) with age.

The greater prevalence of complicated forms of the disease is consistent with the increase in emergency surgery observed in older patients, from 13% in those younger than 80 years old to 23% in those 80-89 years old and 47% in patients over the age of 90. In other series, complicated forms of the disease reached figures similar to our data, in patients aged 80 or above (5,6,14,18,20).

The increase in cancers of the right colon and the decrease in the prevalence of rectal cancer in elderly patients are well known (15,20,21). This difference in tumour location explains the lower prevalence of rectal haemorrhage and tenesmus with increasing age, evident in our study. On the other hand, anaemia and intestinal occlusion increase progressively with age, being found in more than 40% of the nonagenarian patients in our series.

Despite the fact that most cases of colorectal cancer are found in the elderly, it has been suggested that they are undertreated, both in early and advanced stages of the disease (3-5). General practitioners, surgeons, gastroenterologists and oncologists tend to assess patients according to their chronological age rather than their biological age. This may explain the finding in our series that a large number

Table IV. Surgical treatment by age groups

	< 70 Cases (%)	70-79 Cases (%)	80-89 Cases (%)	≥ 90 Cases (%)	Chi ²
Rate of patients who underwent surgery	762 (96)	599 (95)	364 (85)	44 (59)	P = 0.0001, 3df, $\chi^2 = 166.97$
Rate of resections in patients who underwent surgery	709 (93)	539 (88)	292 (80)	32 (72)	P = 0.0001, 3df, $\chi^2 = 50.16$
Overall rate of resections	709 (90)	539 (84)	292 (68)	32 (43)	P = 0.0001, 3df, $\chi^2 = 50.16$
Rate of curative-intent surgery	615 (80)	468 (78)	267 (74)	29 (66)	P = 0.0095, 3df, $\chi^2 = 1.46$

Table V. Mortality analysis

	Cases	Exitus	%	
Sex				NS
Men	1037	85	8	
Women	732	56	8	
Age				$p = 0.0001$, 3df, $\chi^2 = 50.29$
< 70	762	32	4	
70-79	600	47	8	
80-89	364	51	14	
≥ 90	33	11	25	
Nature of the surgery				$p = 0.0001$, 1df, $\chi^2 = 85.96$
Elective	1490	80	5	
Emergency	277	61	22	
Surgical intent				$p = 0.0001$, 1df, $\chi^2 = 41.66$
Curative	1339	73	6	
Palliative	377	59	16	
ASA grade				$P = 0.0001$, 1df, $\chi^2 = 192.68$
ASA I	497	8	2	
ASA II	570	28	5	
ASA III	477	38	8	
ASA IV	207	59	29	
ASA V	4	5	80	
Local complications				NS
No	1214	87	7	
Yes	555	54		10
Systemic complications				$p = 0.0001$, 1df, $\chi^2 = 406.21$
No	1443	26	2	
Yes	326	115	35	

of patients over the age of 80 years were not staged, specifically, 18% of cases in octogenarians and 45% in nonagenarians. These worrying figures are consistent with rates of 19% (5) and 23% (2) reported for patients above 75 years of age, and those published by the Cancer Collaborative Group (6): 3.9% of patients younger than 65 years old, 6.1% of 65- to 74-year-olds, 9.0% of 75- to 84-year-olds

and 17.3% of those 85 years of age or older. Another important fact is that screening programmes for colorectal cancer are carried out in populations aged between 50 and 69 years of age (22) while, as in our series, individuals older than 70 years old represent some 60% of cases. Indeed, some authors have suggested that the option of screening should be offered up to the age of 80 or even 85 (23).

Table VI. Mortality analysis by age group in operated patients

	< 70 exitus/n (%)	70-79 exitus/n (%)	80-89 exitus/n (%)	≥ 90 exitus/n (%)	χ^2
Type of surgery					
Elective	16/663 (2)	31/571 (6)	30/282 (11)	3/25 (12)	$p = 0.0001$, 3df, $\chi^2 = 29.32$
Emergency	16/99 (16)	16/78 (21)	21/81 (26)	8/19 (42)	NS
Total operated	32/762 (4)	47/595 (8)	51/363 (14)	11/44 (25)	$p = 0.0001$, 3df, $\chi^2 = 50.45$
ASA grade					
ASA I	2/316 (2)	5/125 (4)	1/54 (2)	0/2 (0)	NS
ASA II	6/241 (3)	11/200 (6)	10/110 (9)	1/17 (6)	NS
ASA III	6/151 (4)	13/185 (7)	15/124 (12)	4/16 (25)	$p = 0.005$, 3df, $\chi^2 = 12.70$
ASA IV	18/51 (35)	15/79 (19)	22/71 (31)	4/6 (67)	$p = 0.027$, 3df, $\chi^2 = 9.17$
Patients with systemic complications	22/96 (30)	36/114 (32)	46/101 (46)	11/13 (85)	$P = 0.0001$, 3df, $\chi^2 = 25.55$
Patients with local complications	14/229 (6)	14/198 (11)	15/113 (13)	4/14 (29)	$P = 0.013$, 3df, $\chi^2 = 10.84$

Table VII. Mortality analysis. Logistic regression

	<i>Df.</i> <i>Higher</i>	<i>Sig.</i> <i>Lower</i>	<i>Exp (B)</i> <i>Higher</i>	<i>C.I. 95.0% for Exp (B)</i> <i>Lower</i> <i>Higher</i>	
Age	1	0.016	1.865	1.123	3.095
Sex	1	0.871	0.960	0.582	1.582
Nature of the surgery	1	0.001	2.402	1.422	4.058
ASA grade	1	0.000	3.216	1.945	5.318
Palliative surgery	1	0.380	1.619	0.552	4.752
Resection	1	0.352	0.681	0.304	1.528
Stage of the tumour	1	0.152	2.227	0.746	6.654
Local complications	1	0.902	0.969	0.589	1.594
Systemic complications	1	0.000	30.474	17.374	53.453
Constant	1	0.000	0.006		

There were significant differences between the four age groups studied in the percentages of patients who received surgical treatment, the rates being 96%, 85%, and 59% in those under 80 (our first two groups combined), octogenarians, and nonagenarians, respectively. These figures are comparable though slightly lower than the figure of 87% of patients over 75 years of age undergoing surgery reported by Aparicio et al. (5). The differences are even more significant when the overall rates of resection are analysed, these rates being 90%, 84%, 68% and 43% for the < 70, 70-79, 80-89 and ≥ 90 age groups, respectively. A systematic review carried out by the Colorectal Cancer Collaborative Group (6) analysed surgical data on 34,194 patients, with individuals divided into four age groups: younger than 65, 64-74, 75-84 and over 84 years of age. In that study, the rates of curative surgery observed were similar to those for the patients in our series who underwent surgery (80% and 78% in the younger two age groups, 74% for those 80-

89 years old and 66% for those ≥ 90 years old). However, Aparicio et al. (5) reported rates of curative resection of only 48% in patients older than 75 years old, which contrast with the figure of 92% for the same age group published by Faivre-Finn et al. (14).

In our univariate analysis, postoperative mortality was associated with increasing age, the surgery being carried out as an emergency procedure and with palliative intent, advanced tumour stages and higher perioperative risk (ASA grade), which is in line with the findings of other authors (2,3,5). However, in the multivariate analysis, the main factors associated with mortality were the emergency nature of the surgery, the ASA grade, and the presence of systemic complications, the weight of age being significantly lower than that indicated by the univariate analysis.

It should be highlighted that when we compared mortality between biologically strong and otherwise healthy patients (ASA I and ASA II) there were no significant dif-

Table VIII. Comparative analysis of morbidity by age group

	< 70 <i>n</i> = 763 cases (%)	70-79 <i>n</i> = 596 cases (%)	80-89 <i>n</i> = 363 cases (%)	≥ 90 <i>n</i> = 44 cases (%)	<i>Chi</i> ²
Local complications	229 (30)	198 (33)	113 (31)	14 (32)	NS
Wound infection	109 (14)	87 (15)	43 (12)	5 (11)	NS
Anastomotic fistula	63 (8)	48 (8)	23 (6)	6 (14)	NS
Abdominal Abscess	28 (4)	23 (4)	10 (3)	0 (0)	NS
Postoperative bleeding	10 (1)	8 (1)	13 (4)	1 (2)	$p = 0.04$, 3df, $\chi^2 = 8.22$
Others	25 (3)	28 (5)	14 (4)	1 (2)	NS
Systemic complications	96 (13)	114 (19)	101 (28)	13 (30)	$p = 0.0001$, 3df, $\chi^2 = 42.62$
Heart	10 (1)	21 (4)	28 (8)	8 (18)	$p = 0.0001$, 3df, $\chi^2 = 53.19$
Respiratory	25 (3)	33 (6)	34 (9)	5 (11)	$p = 0.0001$, 3df, $\chi^2 = 20.64$
Renal	3 (1)	9 (2)	8 (2)	5 (11)	$p = 0.0001$, 3df, $\chi^2 = 38.60$
Cerebrovascular	2 (1)	3 (1)	4 (1)	1 (2)	NS
Thromboembolism	3 (1)	9 (2)	7 (2)	0 (0)	NS
Digestive tract bleeding	8 (1)	10 (2)	7 (2)	2 (5)	NS
Overall rate of complications	268 (35)	245 (41)	171 (47)	22 (50)	$p = 0.001$, 3df, $\chi^2 = 17.34$

ferences between the four age groups analysed. It is clear that the presence of associated disorders, such as heart disease, bronchopneumonia, and renal failure, makes older patients more fragile, which translates to a significant increase in mortality among this group. From all this, we can draw the conclusion that age by itself is not a factor on which to base decisions, especially in patients with no severe associated disorders. We also note that excision of tumour through the anus is an option for the treatment of early rectal cancer in elderly patients with relevant comorbidities (24).

Our study shows that the rate of postoperative complications progressively increases with age. This can be attributed to systemic complications, in particular of the cardiovascular, respiratory and renal systems, generally corresponding to a worsening of pre-existing comorbidities. Patients who develop these complications have a higher risk of postoperative death. However, there were no significant differences either in the overall rate of local complications (infection of the surgical wound, anastomotic fistulae or intra-abdominal abscesses) or when rates of such complications were analysed separately. These findings agree with those of other authors (6,20,21,25-29).

On the other hand, it has been reported that the length of the postoperative stay increases in the most elderly patients (5,21), but this was not corroborated our data, which indicate that this parameter is not affected by patient age.

To conclude, we can state that the rates of surgical treatment, tumour resection, and surgery with intention to cure dramatically decrease in octogenarian and nonagenarian patients, while the weight of age in operative mortality due to colon cancer in such patients is much lower than that of other variables such as the nature and intent of the surgery (emergency or elective; curative or palliative), the perioperative risk (ASA grade) and the occurrence of severe systemic complications. In particular, local morbidity is not influenced by age, whereas systemic morbidity does increase in octogenarian and nonagenarian patients, linked to underlying heart, respiratory and renal diseases.

Given that clinical trials are the main method for assessing the efficacy of the treatment of cancer patients, trials should be carried out specifically focusing on elderly patients to assess the risks and benefits of various approaches to treating colorectal cancer, including surgery and/or neoadjuvant or adjuvant therapies, in this apparently highly vulnerable population.

DECISION MAKING IN OCTOGENARIAN AND NONAGENARIAN PATIENTS

Given the great variability in functional deterioration between elderly individuals, one of the first factors to bear in mind is the need to establish the biological age of a patient. It is also important to estimate their life expectancy, which depends on associated disorders and functional status

as well as their chronological age. In a high percentage of patients older than 80 years of age, life expectancy is far longer than the time to the development of metastasis that may compromise survival. The second step is then to assess whether the cancer represents a threat to the health or functioning of the individual with respect to their life expectancy. Lastly, the third consideration is whether the cancer or potential complications are a threat to the functional status and the quality of life of the patient. Accordingly, the risk of surgery must be weighed against the risk of not treating surgically. This decision-making process requires that the specialists involved (surgeons, gastroenterologists, and oncologists, among others) have sufficient understanding of the patient's life expectancy, the natural progress of the disease and the surgical risk in each patient.

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