

# SURVIVAL OF COLORECTAL CANCER IN A REFERENCE HOSPITAL OF BARCELONA (1992-2007)

Fernando Agüero<sup>1,2</sup>, Cristiane Murta-Nascimento<sup>1</sup>, Manel Gallén<sup>3</sup>, Montserrat Andreu-Garcia<sup>4</sup>, Cristina Hernández<sup>1</sup>, Andrea Burón<sup>1</sup>, Francesc Macià<sup>1,5,\*</sup>

<sup>1</sup>Servei d'Epidemiologia i Avaluació. Hospital del Mar - Parc de Salut Mar, Barcelona, Spain. <sup>2</sup>Unitat Docent de Medicina Preventiva i Salut Pública Hospital del Mar-UPF-ASPB, Barcelona, Spain. <sup>3</sup>Servei d'Oncologia. Hospital del Mar - Parc de Salut Mar, Barcelona, Spain.

<sup>4</sup>Servei de Digestologia. Hospital del Mar - Parc de Salut Mar, Barcelona, Spain. <sup>5</sup>CIBER de Epidemiologia y Salud Pública (CIBERESP), Spain

\*Contact: fmacia@parcdesalutmar.cat

## INTRODUCTION

Colorectal cancer (CCR) is major public health problem in Western countries. The incidence of this tumour in Catalonia is one of the highest reported in Europe.

The survival of patients with CCR in Catalonia has been improving for the past 20 years. It was estimated that the 5-year survival rates for men and women with CCR was 42.7% and 44.6% for the period 1985-1989, 47.4% and 48.3% in 1990-1994, 52.9% and 49.9% in 1995-1999, respectively.

The aim of this study was estimate the 5- and 10-year disease-specific survival for patients with colorectal cancer diagnosed and/or treated in a teaching hospital in Barcelona, Spain. Furthermore, we accessed the clinicopathological and organizational factors affecting disease-specific survival.

## METHODS

This study was based on the information recorded by the Cancer Registry of the Hospital del Mar. This centre is a public teaching hospital primarily serving a population low-income area of 300,000 inhabitants in Barcelona (Catalonia, Spain)

The follow up information is updated automatically every time subjects come to the hospital for a consultation or if they are admitted. Information on date and cause of death are obtained periodically through a record linkage procedure between the hospital-based cancer register and the Catalan Mortality Registry.

A cohort of 2,341 patients with a primary colorectal carcinoma (ICD-9 153 and 154, except 154.2 and 154.3) diagnosed between 1992-2007 was identified from the database. Of the original cohort, 2,179 patients were eligible after exclusion of 9 cases diagnosed only through autopsy, and 153 patients with a diagnosis of carcinoma *in situ*.

Patients were followed until 31 December 2008. The outcome of interest was colorectal cancer-related death. Patients who were alive at the end of the study, those lost to follow-up, and those who died from other causes were censored either at last contact or at death.

Five- and 10-year specific survivals were estimated by the Kaplan-Meier method. Kaplan-Meier survival curves were plotted and the differences between categories of each variable were assessed using the log-rank test. Hazard ratios (HR) and 95% confidence interval (95%CI) were estimated using Cox models.

## RESULTS

Clinicopathological and organizational characteristics of the 2,023 patients according diagnostic period are shown in Table 1. The median age at diagnosis was 72 years and 58.1% were men.

The specific survival at 5-year was 54.1% (95%CI 51.7-56.5) and at 10-year was 47.4 (95%CI 44.6-50.1).

In the multivariate analysis (Table 2), male patients (HR 1.2; 95%CI 1.1-1.4), those in advanced age at diagnosis ( $\geq 80$  years: HR 1.8; 95%CI 1.3-2.6), patients with advanced stage (stage IV: HR 18.2; 95%CI 11.3-24.9), those with poorly differentiated tumour (HR 2.4; 95%CI 1.6-3.8) and those admitted as an emergency (HR 1.6; 95%CI 1.4-1.8) presented less favourable prognosis.

Table 1. Distribution of cases by diagnosis period, n (%)

Characteristic	Total	1992-1997	1998-2002	2003-2007
<b>Number of cases</b>	2179	666 (30.6)	667 (30.6)	846 (38.8)
<b>Gender</b>				
Female	913	281 (42.2)	297 (44.5)	335 (39.6)
Male	1266	385 (57.8)	370 (55.5)	511 (60.4)
<b>Age at diagnosis (years)</b>				
<50	113	30 (4.5)	40 (6.0)	43 (5.1)
50-69	797	279 (41.9)	231 (34.6)	287 (33.9)
70-79	758	221 (33.2)	221 (33.1)	316 (37.4)
$\geq 80$	511	136 (20.4)	175 (26.2)	200 (23.6)
<b>Site</b>				
Colon	1468	389 (58.4)	471 (70.6)	608 (71.9)
Right	532	127 (32.6)	171 (36.3)	234 (38.5)
Left	771	177 (45.5)	257 (54.6)	337 (55.4)
Unknown	165	85 (21.9)	43 (9.1)	37 (6.19)
Rectum	711	277 (41.6)	196 (29.4)	238 (28.1)
<b>Stage grouping at diagnosis</b>				
I	305	98 (14.7)	76 (11.4)	131 (15.5)
II	662	212 (31.8)	215 (32.2)	235 (27.8)
III	616	179 (26.9)	179 (26.8)	258 (30.5)
IV	450	132 (19.8)	136 (20.4)	182 (21.59)
Unknown	146	45 (6.8)	61 (9.1)	40 (4.7)
<b>Histological grade</b>				
I	108	27 (4.1)	29 (4.3)	52 (6.1)
II	1706	549 (82.4)	531 (79.6)	626 (74.0)
III/IV	175	33 (5.0)	55 (8.2)	87 (10.3)
Unknown or not evaluated	190	57 (8.6)	52 (7.8)	81 (9.6)
<b>Type of admission</b>				
Elective	1078	273 (41.0)	316 (47.4)	489 (57.8)
Emergency	1101	393 (59.0)	351 (52.6)	357 (42.2)

Table 2. Colorectal cancer-specific survival Cox proportional hazards model

Characteristic	Univariate		Multivariate	
	HR	95%CI	HR	95%CI
<b>Period of diagnosis</b>				
1992-1997	1.00	ref.	1.00	ref.
1998-2002	1.02	0.87-1.19	1.02	0.88-1.21
2003-2007	0.82	0.69-0.96	0.84	0.70-1.00
<b>Gender</b>				
Female	1.00	ref.	1.00	ref.
Male	1.22	0.98-1.28	1.21	1.05-1.39
<b>Age at diagnosis (years)</b>				
<50	1.00	ref.	1.00	ref.
50-69	1.04	0.75-1.44	1.16	0.83-1.62
70-79	1.20	0.87-1.67	1.50	1.07-2.09
$\geq 80$	1.99	1.43-2.77	1.79	1.26-2.55
<b>Site</b>				
Colon	1.00	ref.	1.00	ref.
Rectum	0.98	0.86-1.13	1.05	0.91-1.23
<b>Subsite - Colon</b>				
Right	1.00	ref.	1.00	ref.
Left	1.10	0.92-1.32	1.24	1.03-1.50
Unknown	1.90	1.48-2.44	1.34	1.01-1.77
<b>Stage grouping at diagnosis</b>				
I	1.00	ref.	1.00	ref.
II	2.05	1.48-2.85	2.10	1.50-2.94
III	3.58	2.60-4.91	4.54	3.23-6.37
IV	16.23	11.85-22.23	15.84	11.20-22.39
Unknown	3.77	2.53-5.64	2.11	1.36-3.27
<b>Histological grade</b>				
I	1.00	ref.	1.00	ref.
II	1.65	1.12-2.44	1.61	1.08-2.42
III/IV	3.99	2.60-6.15	2.70	1.73-4.19
Unknown or not evaluated	4.57	2.98-7.02	2.14	1.37-3.35
<b>Route to diagnosis</b>				
Elective	1.00	ref.	1.00	ref.
Emergency	1.83	1.60-2.09	1.41	1.22-1.63

## CONCLUSIONS

The survival of patients with colorectal cancer improved from 1992 to 2007. Factors that affected the survival of this tumour were: gender, age, stage, the degree of histological differentiation and type of hospital admission.

**Funding:** This work was supported by a grant from the *Fondo de Investigación Sanitaria*, ISCIII, Spain (FIS-FEDER PI07/90861)