



Increased survival and decreased recurrence in colorectal cancer patients diagnosed in a screening programme



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ABSTRACT

Introduction: Population-based screening programmes for colorectal cancer (CRC) allow an early diagnosis, even before the onset of symptoms, but there are few studies and none in Spain on the influence they have on patient survival. The aim of the present study is to show that patients receiving surgery for CRC following diagnosis via a screening programme have a higher survival and disease-free survival rate than those diagnosed in the symptomatic stage.

Material and methods: Prospective study of all the patients undergoing programmed surgery for CRC at the JM Morales Meseguer Hospital in Murcia (Spain) between 2004 and 2010. The patients were divided into two groups: (a) those diagnosed through screening (125 cases); and (b) those diagnosed in the symptomatic stage (565 cases). Survival and disease-free survival were analysed and compared for both groups using the Mantel method.

Results: The screen-detected CRC patients show a higher rate of survival (86.3% versus 72.1% at 5 years, $p < 0.05$) and a lower rate of tumour recurrence (73.4% versus 88.3% at 5 years, $p < 0.05$).

Conclusions: Population-based screening for CRC is an effective strategic measure for reducing mortality specific to this neoplasia.

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1. Introduction

The study of any aspect related to colorectal cancer (CRC) is important for two fundamental reasons: a high incidence and a high mortality rate.

Colorectal cancer is one of the most common cancers in developed countries, with an incidence in Europe of 471000 new cases and 228000 deaths in the year 2012 [1]. In Spain, an incidence of 22128 cases and mortality of 14303 cases in the 2008 (13.3% of all cancer deaths) are estimated [1].

CRC survival in Spain, according to the results of EURO-CARE-5 (European Cancer Registry Study of Survival and Care of Cancer Patients), was 57.1% at 5 years in colon cancer and 56.4% in the rectum for patients diagnosed between 2000 and 2007, ranking in the European average (57% to 56% for colon and rectum) [2].

In recent years there has been an increase in survival rate due on the one hand to improved treatment [2,3] in terms of surgical

technique and advances in chemotherapy and on the other to an improved early diagnosis.

Colorectal cancer is an ideal candidate for population-based screening for several reasons [4]: (a) it is a public health problem due to its high prevalence and mortality rate; (b) it is known to have a slow natural history, with a long pre-symptom phase and treatable precancerous lesions; (c) diagnostic methods are available for detecting the disease in its initial or premalignant stages; (d) the prognosis is favourable when the disease is in an early stage.

The usefulness of CRC screening is currently beyond question due to the existing scientific evidence: the National Polyp Study Group estimates that an adequate screening programme might prevent up to 90% of CRC cases [4], Faivre group proves that CRC mortality was significantly lower in the screening population compared with the control population (mortality ratio, 0.87; 95% confidence interval, 0.80–0.94) [5] and cost-effective analyses of these strategies also show a clear benefit [6]. However, whereas CRC screening programmes are widely implemented in countries such as the USA [7], in Spain only a few regions (including Murcia) have these programs in a enough period to analyze results [8].

In Spain, CRC screening programmes are implemented and managed on a regional basis. Although the first population-based

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pilot screening programme for CRC in Spain was implemented in 2000 [9], it was not until 2009 that Spain's National Health System (NHS) Cancer Strategy recommended the implementation of CRC screening programmes throughout the Spanish territory [10]. Currently, 12 of Spain's 17 regions have initiated screening programmes, and eight are able to provide data from at least one screening round [11].

In order to increase the efficiency of screening strategies it is fundamental to identify and characterise the subpopulations with a greater incidence of colorectal lesions [12] and thus establish a target population. From a practical standpoint the individual risk of presenting with CRC is divided into: (a) low, corresponding to individuals aged under 50 years with no risk factors (personal or familial), in whom screening for this neoplasia is not deemed necessary; (b) medium, relating to individuals aged 50 years upwards with no additional risk factors (personal or familial history of adenomas or CRC); (c) high, corresponding to patients with an associated risk factor, who do qualify for specific screening or vigilance programmes.

The aim of the present study is to clarify whether patients receiving surgery for CRC following diagnosis through a screening programme have a better survival and higher mean disease-free survival rate than those diagnosed in the symptomatic stage.

2. Patients and methods

2.1. Study design and groups

Prospective study of all the patients undergoing programmed surgery for colorectal cancer at the José María Morales Meseguer Hospital in Murcia (Spain) between 1 January 2004 and 31 December 2010. The patients were followed up until 31 December 2012, that was when the study was closed.

The patients were divided into two groups: (1) *Symptomatic Group*: 565 patients who were diagnosed after presenting with suspicious signs and/or symptoms; (2) *Screening Group*: 125 patients diagnosed via the screening programme.

2.2. Characteristics of the screening project

They are shown in Table 1. The target population are males and females aged 50–69 years; the screening test is the faecal occult blood immunochemical test (two determinations on two successive days), with biennial periodicity and the diagnosis confirmation test is optical colonoscopy where possible and computed colonography in cases where optical colonoscopy is not possible.

It consists of two phases, detailed in Table 2: the first phase is the capture of the target population, based on information campaigns and invitation to participate through letters, and another phase of colonoscopies and analysis of results.

The rate of participation in our screening programme was 54.70% with a 10.12% rate of faecal occult blood test (FOBT) positives. A colonoscopy was indicated in these patients and the rate of acceptance was 95.5%.

2.3. Exclusion criteria

The following were excluded: patients undergoing emergency surgery; those in whom the definitive anatomopathological diagnosis was not colorectal cancer; and those that did not undergo tumour resection, but related palliative techniques, and therefore have no pathological anatomy study.

2.4. Statistical analysis

A unifactor analysis was performed of survival and disease-free survival using the actuarial method. To compare the survival curves we used the Mantel method and considered differences significant for $p < 0.05$.

The terminal event in our case is the death of the patient due to CCR.

The censored patients are those in which there has been the terminal event. In our case they are those subjects where the exitus not due to neoplasia and those who could not follow up monitoring for various reasons (transfer to another community, abandonment of monitoring by the patient . . .)

Table 1
Characteristics of screening.

- <i>Target population</i> : men and women between 50 and 69 years
- <i>Screening test</i> : immuno-chemical test for the determination of fecal occult blood, two determinations on two successive days
- <i>Periodicity</i> : Biennial
- <i>Test diagnostic confirmation</i> : optical colonoscopy when possible and computed tomographic colonography in cases where it is not possible optics.
- <i>Diagnostic Performance</i> : resection of polyps that are detected and histopathologic analysis and biopsy of unresectable and/or lesions suspicious for malignancy and definitive treatment.

Table 2
Screening phases.

Phase 1: Recruitment and Screening (By Health Center, every 6 months):
- Information to Team primary care and pharmacies.
- An Invitation letter to participate to the target population
- Collection And analysis of samples
- Reports of results and sending of letters with them.
Phase 2: Diagnostic and Treatment Confirmation:
- Phone ad patients with positive outcome to attend consultation preparation for colonoscopy and signature of informed consent
- Making Colonoscopy
- Analysis Pathology polyps removed
- Report of results to the patient in consultation and referral to the surgeon, if applicable.

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