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Socio-demographic, clinical and care pathway profile of colorectal cancer patients at the National Institute of Oncology, Rabat, Morocco

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Abstract

Aim: In Morocco, colorectal cancer (CRC) is the third most common cancer considering both sexes. Its diagnosis at an advanced stage is often associated with a poor prognosis and reduced survival rates. However, the time from symptom onset to diagnosis or treatment has also been considered as a predictor of stage and survival. This study aims to investigate the sociodemographic, clinical and care pathway profile of CRC patients.

Material and Methods: A retrospective cross-sectional study with analytical goals was conducted on CRC cases admitted to the National Institute of Oncology (NIO) during 2015-2016. Three hundred twenty-one CRC cases were included. Socio-demographic, clinical profile and care pathway data of the patients were collected from the medical records using a collection form. The Kish formula was used to determine the study population. Statistical analysis was performed using Epi-Info software (version 7).

Results: The mean age was 58 years and the female/male sex ratio was 1.09; 73.7% of CRCs were diagnosed at a late stage (stage III or VI). Also, 73.0% of the cases were married, 67.3% were from urban areas, and 77.9% were mainly covered by RASED. The most frequent histological type was adenocarcinoma (93.4%). In 21.9% of cases, urgent surgery was the mode of discovery of the tumor. Surgery was the first treatment considered for CRC patients (55.5%). For colon cancer, surgery was the first treatment in 82.6% of cases; and for rectal cancer, radiotherapy and concomitant chemotherapy were the first treatment received in 46% of cases.

Discussion: The results of the present study show that the onset of clinical signs was not in favor of an early diagnosis. It would then be essential to study the delays of diagnosis and treatment in the horizon to support early management of CRC before the appearance of alarming signs.

Keywords

Colorectal Cancer, Socio-Demographic Profile, Clinical, Care Pathway, Morocco

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Introduction

Colorectal cancer (CRC) is one of the leading causes of mortality and morbidity worldwide [1]. It is the third most common malignancy and the fourth most common cause of cancer-related death worldwide with 1,400,000 new cases and approximately 700,000 deaths all over the world [2]. Over the past few decades, there has been a significant increase in the incidence of CRC. In fact, the number of newly diagnosed CRC cases increased from 783,000 in 1990 to 1,361,000 in 2012 [3]. In terms of geographical distribution, the incidence of this cancer has increased in industrialized countries with a medium or high human development index (HDI) [2].

In Morocco, colorectal cancer is the third most frequent cancer considering both sexes with a proportion of 8.3% in men and 7.8% in women. Its frequency increases with age, with the most affected age group between 65 and 74 [3]. As for mortality attributable to CRC, it was estimated at 1699 (7.5%) deaths in 2012 [2]. According to the TNM classification [4], 49.5% of CRC cases are diagnosed at stage III or IV, and only 8.9% of cases are diagnosed at stage I [5].

The objective of this study is to investigate the sociodemographic, clinical and organizational characteristics of colorectal cancer patients at the National Institute of Oncology in Rabat during the years 2015 and 2016.

Material and Methods

Type, population and location of the study

This is a retrospective cross-sectional study with an analytical focus that took place at the National Institute of Oncology in Rabat. A total of 321 records were reviewed between December 2017 and March 2018. We included in the study patients admitted for CRC management whose diagnosis was confirmed by anatomopathological examination. Patients with a personal history of other cancers were excluded from the study.

Data collection

Data on socio-demographic characteristics (age, gender, employment status, number of children, place of residence, type of social security coverage, drug habits, family history of cancer), clinical characteristics (tumor location, clinical signs, date of onset, stage histological type, differentiation, tumor markers, comorbidities) and data on the treatment pathway (examinations performed, institution, place of examination, extension assessment, type of treatment, place of treatment, the start date of the treatment) were collected using a data collection form.

Statistical analysis

The analysis included a description of the study population according to different socio-demographic, clinical and organizational characteristics. Determination of the study population was performed using the Kish formula. The database was created in Excel and statistical analysis was performed using Epi-Info software (version 7).

Ethical considerations

Our study was approved by the Biomedical Research Ethics Committee of the Faculty of Medicine and Pharmacy of Rabat. Authorization for data collection was granted by the management of NIO in Rabat. The study was conducted in compliance with the rules of confidentiality and professional secrecy, in accordance with law 09-08 on the protection of individuals with regard to the processing of personal data.

Results

A total of 365 records were reviewed during the period December 2017 - March 2018, of which 44 cases not meeting the inclusion criteria were excluded. Three hundred twenty-one patients involved were admitted to NIO for CRC management, including 149 colon cancer cases, 157 rectal cancer cases, and 15 dual-site (colon and rectal) cancer cases.

Table 1 presents the demographic characteristics of the study population. The mean age was (58 ± 15) years, and 74.0% of patients were 50 years or older. The female to male sex ratio was 1.09. The majority of cases were married (73.0%). Two out of three patients (67.3%) were from urban areas. With regard to employment status, only 45 of the 259 patients were employed

Table 1. Socio-demographic profile of CRC patients admitted to NIO during 2015-2016

Variable	Colorectal (N=321)		Colon (N=149)		Rectum (N=157)	
	N	%	n	%	n	%
Age	320					
Less than 50 years old	84	26,3	38	25,7	40	25,5
50 to 74 years old	187	58,4	88	59,5	92	58,6
75 years and older	49	15,3	22	14,8	25	15,9
Sex	321					
Female	168	52,3	81	54,4	80	50,9
Male	153	47,7	68	45,6	77	49,1
Marital status	318					
Single	33	10,7	9	6,2	18	12,2
Married	226	73,4	113	77,4	106	71,6
Divorced	12	3,9	6	4,1	6	4,0
Widowed	37	12,0	18	12,3	18	12,2
Area of residence	321					
Urban	216	67,3	99	66,4	106	67,5
Rural	105	32,7	50	33,6	51	32,5
Distance between place of residence and NIO	321					
< 50 km	104	32,4	47	31,5	50	31,8
> 50 km	217	67,6	102	68,5	107	68,2
Employment status	259					
Active	45	17,4	20	17,2	21	16,2
Retired	22	8,5	9	7,8	12	9,2
Homemaker	192	74,1	87	75,0	97	74,6
Type of social coverage	289					
MHI[1]/insurance	64	22,1	33	24,8	29	20,6
RASED[2]	225	77,9	100	75,2	112	79,4
Smoking	197					
Yes	44	22,3	19	21,6	22	21,8
No	153	77,7	69	78,4	79	78,2
Alcoholism	192					
Yes	6	3,1	4	4,7	1	1,0
No	186	96,9	81	95,3	98	99,0
Family history of cancer	180					
No history	156	86,7	80	91,9	73	82,0
Any type of cancer	24	13,3	7	8,1	16	18,0
Colorectal cancer	10	5,5	2	2,3	6	6,7

[1] Mandatory health insurance, [2] Medical assistance scheme for the economically disadvantaged

at the time of diagnosis. The patients were mainly covered by RASED (77.9%). Among 197 patients, nearly a quarter (22.3%) were current or former smokers. A family history of cancer was reported in 24 (13.3%) of 180 cases, including 5.5% of CRC. Table 2 describes the clinical characteristics of the patients. The most reported clinical signs were: rectal bleeding in 164 (51.1%) patients, including 119 cases of rectal cancer, followed by abdominal pain in 141 (43.9%) patients, including 81 cases of colon cancer, and transit disorders in 123 (38.3%) patients. Intestinal obstruction, which constitutes a surgical emergency, was reported in 70 patients, 57 of whom had colon cancer.

According to the TNM classification, the majority of CRCs (73.7%) were diagnosed at a late stage (stage III or VI), including 125 (41.5%) with metastasis, often liver (42.4%) and/or lung (23.2%). The most frequent histological type was adenocarcinoma (93.4%). In 30.2% of cases, the patient had a comorbidity. The most frequent comorbidities were hypertension (13.7%) and diabetes (11.5%).

The management pathway of CRC patients.

The presence of warning signs was the main mode of discovery of CRC (78%), and emergency surgery for occlusion was the second mode of discovery, found in 70 of 320 patients, including 57 with colon cancer (Table 3).

Admission to NIO was in 35.9% following an intra CHIS transfer and in 23.3% following a transfer from a public institution. Endoscopy with biopsy was performed in 231 (70%) patients, 50% of them within 4 months of the onset of symptoms.

The initial biological workup included tumor markers: carbohydrate antigen (CA19-9) and carcinoembryonic antigen (CEA), which was performed in 129 patients, 55.8% of whom

Table 2. Clinical profile of CRC patients admitted to NIO during 2015-2016

Variable	Colorectal (N=321)		Colon (N=149)		Rectum (N=157)	
	N	%	n	%	n	%
Clinical signs	321					
Chest pain	164	51,1	33	22,2	119	75,8
Abdominal pain	141	43,9	84	56,4	51	32,5
Disturbances of transit	123	38,3	57	38,2	60	38,2
Weight loss	99	30,8	35	23,5	56	35,7
Intestinal obstruction	70	21,8	57	50,4	13	10,7
Alteration of the general state	67	20,9	33	22,2	32	20,4
Tenesmus	60	18,7	2	1,3	56	35,7
Other signs	116	36,1	67	45,6	45	28,7
Stage at diagnosis (TNM*)	301					
I	19	6,3	5	3,6	12	8,2
II	60	19,9	37	26,4	21	14,3
III	97	32,2	43	30,7	49	33,3
IV	125	41,5	55	39,3	65	44,2
Histological type	314					
Adenocarcinoma WFI**	151	48,1	76	52,1	69	44,8
Lieberkunian adenocarcinoma	112	35,7	48	32,9	57	37
Other adenocarcinoma	37	11,8	20	13,7	16	10,4
Carcinoma	8	2,5	0	0	8	5,2
Other	6	1,9	2	1,4	4	2,6
Differentiation	276					
Well to moderately differentiated	264	95,6	121	95,3	130	95,6
Undifferentiated to poorly differentiated	12	4,3	6	4,7	6	4,4
Somatic examination (WHO)***	310					
≤1	167	78,4	81	80,2	81	77,1
>1	46	21,6	20	19,8	24	22,9
Comorbidities	321					
Yes	97	30,2	47	31,5	45	28,7
No	224	69,8	102	68,5	112	71,3
Surgical history	321					
Yes	64	19,9	30	20,1	32	20,4
No	257	81,1	120	79,9	125	79,6

* T= tumor, N= nodules, M= metastases, ** Without further information, *** The Eastern Cooperative Oncology Group (ECOG) scale, also known as the "WHO scale" or "Zubrod scale" after C. Gordon Zubrod, ranges from 0 to 5, where 0 represents good health and 5 represents death. Gordon Zubrod, spans six values, from 0 to 5, where 0 represents good health and 5 represents death. (Oken et al. in 1982).

Table 3. Management pathways for CRC patients admitted to NIO during 2015-2016

Variable	Colorectal (N= 321)		Colon (N= 149)		Rectum (N= 157)	
	N	%	n	%	n	%
Mode of discovery of the tumor	320					
Presence of warning signs	250	78,1	92	61,7	143	91,6
Emergency intervention (occlusion)	70	21,9	57	38,3	13	8,4
Types of admission to NIO1	301					
Intra ISH2 transfer	108	35,9	57	41,6	49	32,5
Transfer outside ISH2 (public)	70	23,3	35	25,6	32	21,2
Transfer to private physician	123	40,8	45	32,8	70	46,3
Endoscopy	321					
Done	231	71,9	78	52,3	141	89,8
Not done	90	28,1	71	47,7	16	10,2
Tumor markers, initial workup	321					
Done	129	40,2	68	45,6	57	36,3
Not done	192	59,8	81	54,4	100	63,7
Extension workup (initial imaging)	321					
Done	299	93,2	133	89,3	153	97,5
Not done	22	6,8	16	10,7	4	2,5
Recourse to surgery	283					
Yes	218	77	120	91	88	63,3
No	65	23	12	9	51	36,7
Use of chemotherapy	283					
Yes	213	75,3	95	72	110	79,1
No	90	24,7	37	28	29	20,9
Use of radiotherapy	283					
Yes	93	33	5	3,8	85	61,2
No	189	67	126	96,2	54	38,8
First treatment	283					
Surgery	157	55,5	109	82,6	40	28,8
Concurrent radiochemotherapy	69	24,4	2	1,5	64	46
Chemotherapy	43	15,2	21	15,9	21	15,1
Radiotherapy	14	4,9	0	0	14	10,1
Establishment of 1st therapeutic management	280					
NIO1	179	63,9	57	43,8	114	82,6
Public	63	22,5	49	37,7	11	8
Private	38	13,6	24	18,5	13	9,4

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had a value greater than or equal to 5 µg/l. The initial extension work-up was performed in 299 (93.2%) patients, with CT being the most frequently requested examination with a proportion of 96.3% (Table 3).

A total of 283 patients, of the 321 cases included in our study, received therapeutic management initially with NIO. The cases that did not receive any treatment for their cancer were either lost to follow-up (34 patients) or only palliative care was considered in their case (4 patients). In general, surgery was the first treatment considered for CRC patients (55.5%). In the specific case of colon cancer, surgery was the first treatment in 82.6% of cases and for rectal cancer, radiotherapy and concomitant chemotherapy was the first treatment received in 46% of cases (Table 3).

Discussion

In this retrospective cross-sectional study, we tried to trace the history of discovery of CRC cancer and its treatment in patients admitted to NIO during the period 2015-2016 in order to identify the socio-demographic, clinical and management pathway characteristics of patients.

Our study included 321 patients in whom the diagnosis of CRC was confirmed by anatomopathological examination, including 149 cases of colon cancer and 157 cases of rectal cancer. Our study population was younger compared to European or American populations. The mean age in our study was 58 years with extremes ranging from 18 to 90 years, close to what is reported in previous studies nationwide [5,6], while it is on average 61.7 years in Brazil [7], between 65 and 71 years in Europe [8, 9]. In the majority of countries in Europe, America, Asia and Oceania, where the incidence of CRC is high, a screening program targeting the population aged 50 to 74 years is already in place [10]. This age group represents 58% of our study population. However, in Morocco, no early detection program for CRC has yet been established despite the fact that it is the second most common cancer in both sexes.

The female/male sex ratio in our study was 1.09, while the incidence rate of CRC was higher in men than in women in Morocco [6], as in most regions of the world [2]. All patients included in our study had social security coverage, three quarters of whom were subject to RASED, this could be justified by the free management at NIO for patients affiliated to RASED, and the low attractiveness of NIO, compared to private institutions, for patients with MHI or insurance.

According to the TNM classification, the proportion of CRC cases diagnosed as stage IV in the present study was very high (41.5%, 39.3% and 44.2% for CRC, colon and rectum, respectively). These figures are consistent with those reported in the RCR (2017), but far higher than those reported internationally, which do not exceed 30% [11,12]. Occlusion was the main revealing complication of CRC cancer in general (21.9%) and colonic cancer (38.3%) in particular, requiring emergency intervention. This finding is confirmed by published studies that indicate a proportion of occlusion ranging from 10% to 40% of CRC cancer cases [13,14]. Endoscopy is the key examination in the diagnosis of CRC. It is performed by a medical specialist and can detect even precancerous lesions (polyps). This examination should be indicated in any patient with persistent signs of CRC after symptomatic treatment or following a positive screening test [15]. In our study it was performed in the majority of patients (71.9%).

Regardless of the stage of the tumor at the time of diagnosis, the main treatment was surgery, which was considered in more than half of the cases for all CRC patients (55.5%) and more specifically for colon cancer (82.6%). But for rectal cancer, the proportion of surgery as initial treatment did not exceed 28.8%. For this location, concomitant radio-chemotherapy was the first-line treatment in 46% of cases. The proportions of surgery were lower than those observed in France, where it represents more than 90% and 38% for colon and rectal cancers, respectively [16]. The most radical surgery involves the removal of the large intestine and the rectum, leading to the need for a colostomy with its social, physical and psychological impact [7]. This difference can be explained by the lack of information on patients diagnosed with CRC for whom surgery was indicated, but they were lost to follow-up. Our study has strengths that can be summarized as follows:

- It provides indicators for future research to address ACC in Morocco.
- It is the first study in Morocco, having gathered three aspects (Socioeconomic, clinical and care pathway) of CRC patients.
- The power of our sample size
- The respect of ethical considerations

On the other hand, our study has a point to improve: it could not study the geographical distribution of patients according to the regions of Morocco.

In conclusion, the results of the present study show that the onset of clinical signs was not in favor of an early diagnosis. It would then be essential to study the delays of diagnosis and treatment in the horizon to support early management of CRC before the appearance of alarming signs.

Scientific Responsibility Statement

The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement

All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

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Conflict of interest

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