

## Colorectal Cancer in Morocco : Results of a Retrospective Study

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Colorectal cancer is the third most commonly diagnosed cancer in males and the second in female, with an estimated 1, 4 million cases and 693,900 deaths occurring in 2012<sup>1</sup>. The aim of this study is to determine the epidemiological characteristics of colorectal cancer in Morocco. this is a descriptive retrospective study of colorectal cancer cases diagnosed and treated at Al Azhar Oncology Center in Rabat between 2005 and 2015. During the period of study, there were 641 cases diagnosed with colorectal cancer; 371 (57, 9%) were men and 270 (42, 1%) were women, there was 54 deaths among which 63% were men and 37% were women. The average age of patients with colorectal cancer was  $56 \pm 14.6$  years whereas the average age of death was  $53, 8 \pm 13, 7$  years. The maximum of frequency for this kind of cancer was between the age of 40 and 59 years old. The study also showed that there was no association between the age and the risk of the death. Despite the limitations of the available data, it is clear that there are several barriers to access to cancer control in developing countries. This includes prevention, early detection, diagnosis and treatment.

**Keywords:** Colorectal cancer, epidemiology, Morocco.

Colorectal cancer is the third most common cancer in men and the second in women. Worldwide, approximately 1.4 million cases of colorectal cancer occurred in 2012, with approximately 693.900 deaths from this cancer, representing 8% of deaths<sup>1</sup>.

The highest incidence rates were in North America, Australia, New Zealand, Europe and South Korea. Low rates were in Africa and Southeast Asia<sup>1</sup>.

In France, colorectal cancer is a public health problem that effects 42,152 new patients in 2012 (23,226 men and 18,926 women) with

approximately 17,772 deaths estimated in 2012 (including 52% in men)<sup>2</sup>. In Canada, 9200 cases died in 2012 (5000 men and 4299 women), which represents more than 12.7% of the cases due to this pathology<sup>3</sup>.

In Morocco, the World Health Organization estimates in 2014, 2484 new cases of colorectal cancer and 14.8% of deaths annually<sup>4</sup>.

In order to know the epidemiological situation of colorectal cancer in Morocco, we conducted a descriptive and analytical epidemiology study of the cases collected at the cancer treatment center deemed representative of the liberal sector in the Northern region of Morocco, located in Rabat.

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## MATERIEL AND METHODS

This is a retrospective epidemiological study that took place in Al Azhar Oncology Center over a period of 11 years, from January 2005 until December 2015. This center was founded in July 1994, it includes several units: chemotherapy, brachytherapy, surgery, ira-therapy and bone marrow transplant. A record is created for each patient and contains the location of the tumor; its nature, the protocol and the treatment monitoring. The variables we looked at in our study were sex, age onset of treatment, the evolution (death or non-death), as well as the date and age of death. It should be noted that patients whose deaths are not reported in the records may be either alive or lost to follow-up.

In this study, the indicator in Potential Years of Lost Lives was calculated. PYLL is a measure of the impact of illness and/or health problems in a society, showing losses which are mainly due to the death of young or premature persons <sup>7</sup>.

PYLL is the numbers of years that a subject dies prematurely before an age limit. The choice of the age limit at 65 corresponds to the threshold used by the WHO for international comparisons. Therefore, the calculation of PYLL is excluded for <sup>4</sup>:

- All deaths occurring after the age of 65.
- Infant deaths of less than one year because they are due to specific causes and often have a different etiology than deaths at a later age.

$$PYLL = \sum_{i=1}^L [(L - ai)] \times di$$

- (id): is the number of the deaths in each age group
- (ai): center of age class I
- L: the upper age limit of the study

## RESULTS

During the study period, a total of 641 cases of colorectal cancer were recorded, accounting for 8.2% of all cancers behind breast, cervical and prostate cancer. For example, rectal cancer accounts for 53.5% of total colorectal cancers cases, while colon cancer accounts for only 46.5% of cases (Table I).

Among the colorectal cancer cases 57.9% of male cancers and 42.1% of colorectal cancer are female with a sex ratio of 1.4 ( $\div 2 = 15.914$ ,  $p < 0.0001$ ). The average age of hospitalized patients with colorectal cancer was  $56 \pm 14.6$  years, with extremes ranging from 14 years to 98 years.

Table I shows that the number of deaths from colorectal cancer is 54 of which 63% are male and 37% are female (Table I), with a sex-ratio (M/F) mortality by this cancer is 1.7 ( $\div 2 = 3.630$ ,  $p < 0.05$ ). The average age of the deceased patients is  $53.8 \pm 13.7$  years.

The distribution of colorectal cancers according to age groups adopted by the WHO has shown that the 40-59 age group is the most affected by this type of cancer in 43.3% of cases, followed

**Table 1.** Epidemiological characteristics of patients

Variable	Number of bites (%)	Chi-square) p value	Number of death (%)
Gender			
Female	270 (42.1%)	$(\chi^2 = 15,914 ; p < 0.0001)$	20 (37%)
Male	371 (57.9%)		34(63%)
Total	641 (100%)		54(100%)
Age class			
0 - 15	1 (0.2%)	$(\chi^2 = 796,1 ; p < 0.001)$	—
15 - 20	5 (0.8%)		1(1.9%)
20 - 30	29 (4.7%)		2(3.8%)
30 - 40	49(7.9%)		4(7.8%)
40 - 60	267 (43.3%)		27(51.9%)
$\geq 60$	266 (43.1%)		18(34.6%)
Total	617 (100%)		52(100%)

by the age group 60 years and over with 43.1% of cases then that of 30-39 years with 7.9% of cases. In fact, the number of deceased cases was recorded in the age group of 40 to 59 years with 51.9% of cases and that aged 60 and over with 34.6% of cases (Table I).

The annual distribution of the number of cases of colorectal cancer identified and the annual change in deaths during the study period is shown in table II. According to the results of the table, the year 2008 represents the highest frequency of the number of cases with 16.4% of cases followed by the years 2009 and 2013 with 12.6% of cases (Table II). Referring to the same table, the case-fatality

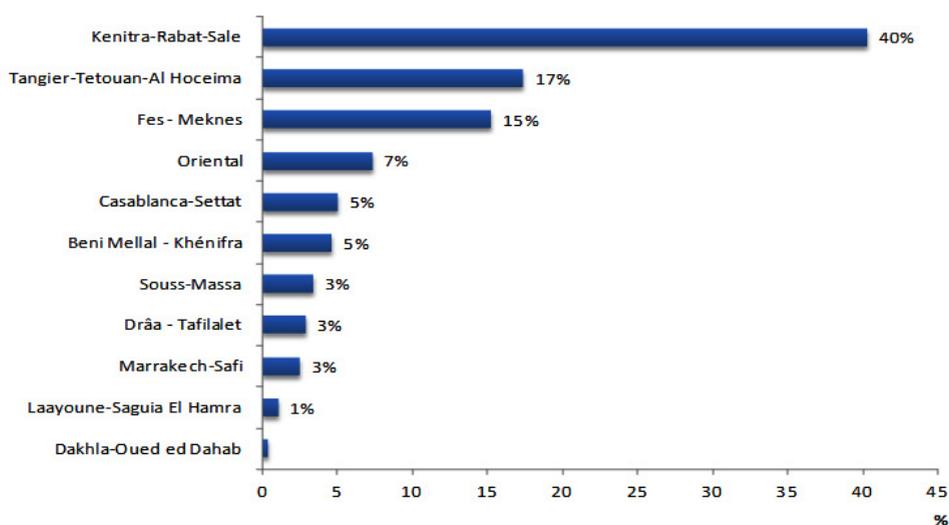
rate during the period from 2005 to 2015 reveals that in 2014 the highest rate was recorded at 9.5% followed by 2006 at a rate of 8.1% of cases (Table II).

On the other hand, the distribution of the studied cases of colorectal cancer according to the origins is represented in figure 1. The majority of the patients come from the region of Rabat Salé-kenitra with 40% of the cases, followed by that of Tangier –Tetouane-Elhouceima with 17% and that of fez-Meknes with 15% (Figure4).

Potential years of lost lives were derived from the number of deaths in the age group included between 0 to 90 years, compared to the

**Table 2.** Annual distribution of colorectal cancer cases and deaths recorded between (2005-2015)

Years	Number of cases	%	Number of deaths	%	Rate of lethality
2005	45	7	0	0	0
2006	37	5.8	3	9.4	8,1
2007	75	11.7	5	15.6	6.7
2008	105	16.4	3	9.4	2.8
2009	81	12,6	3	9.4	3.7
2010	46	7.2	3	9.4	6.5
2011	46	7.2	3	9.4	6.5
2012	22	3.4	1	3.1	4.5
2013	81	12.6	5	15.6	6.2
2014	42	6.6	4	12.5	9.5
2015	61	9.5	2	6.2	3.3
Total	641	100	32	100	5



**Fig. 1.** Distribution of colorectal cancer cases by origin

general population under 65 years of age (Table III). So the PYLL is  $1\,478 * 10\,000 / 33\,848\,242 = 0.43$  per 10 000 inhabitants for all victims who have suffered this pathology. Colorectal cancer is an influential factor in the causes of premature death, which represents 1478 potential years of lost lives.

On the other hand, the calculation of the Odds Ratio for each age class compared to the others showed that there is no significant association between the evolution towards death, neither with the different age groups studies nor with sex. (Table IV).

### DISCUSSION

Colorectal cancer is increasingly a public health problem in terms of diagnosis, treatment and prevention<sup>7</sup>. In Morocco it is the first digestive cancer<sup>4</sup>. During the study period, the analysis of our results gives us an idea of the epidemiological profile of colorectal cancer. The male sex is more affected by colorectal cancer than the female sex with a sex ratio of 1.4. This result is higher than some studies in France<sup>8</sup>, Canada<sup>9</sup> and University Hospital Center of Fez<sup>10</sup> where the sex ratio is 1.2 and in the United States it is 1.1<sup>11</sup>. However, it is

lower than that obtained by some African studies<sup>12-13</sup>.

Also, the sex ratio of mortality by this cancer is 1.7 in our sample. This result is similar to a Canadian study where the sex ratio of the order of 1.7<sup>9</sup>. In other works, this result is discordant; it is 1 in The United States<sup>12</sup> and 1.1 in France<sup>14</sup>.

The distribution of colorectal cancers in terms of age groups adopted by the WHO has shown that patients over the age of 40 years old are the most affected by this type of cancer in 86.4% of cases. This result is similar to studies conducted in Cameroon<sup>12</sup>, France, and the United States<sup>15-16-17</sup>, but it is different to a study in Sab-Saharan Africa which shows that colorectal cancers in the region frequently occurs at an early age<sup>18</sup>.

The distribution of cases collected by origins shows that the highest population was from the Rabat Salé-Kénitra region, with a frequency of 40%. This is mainly due to the proximity since the center studied is in Rabat and does not reflect the geographical distribution of this type of cancer. In addition, consultations from the North-East are more important than those from the South because of the existence of other cancer treatment centers in Casablanca.

### CONCLUSION

The colorectal cancer is a real public health problem, hence the need to organize information campaigns and health education, in order to encourage people to consult from the beginning of the functional signs and to make a decision. Load patients early to have good results.

**Table 3.** Potential years of lost lives

Age class (years)	Deaths	PYLL
15<	-	-
15-20	1	55
20-30	2	100
30-40	4	180
40-60	27	945
60-65	6	198
Total (2005-2015)		1478

**Table 4.** Risk factors that influence the evolution of patients

Variables	Healing	Death	P	OR	IC to 95 %
Gender					
Male	337	34	0.65	0.79	0,44-1,41
Female	250	20			
Age class					
15 <	1	0	0.92	1	0.99-1
20-30	4	1	0.87	2.75	0.30-25.06
30-40	45	4	0.005	0.96	0.33-2.79
40-60	240	27	1.73	1.46	0.82-2.58
≥ 60	248	18	1.67	0.67	0.37-1.22

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