# Colorectal cancer: Population aspects in Bihor County, Romania
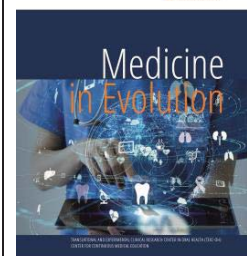
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## Abstract

**Aim and objectives:** The main purpose of our study is to establish prevalence and distribution of colorectal malignancies among people of Bihor County, Romania and to identify the survival according to TNM classification;

**Material and methods:** We included 100 patientes collected in a time interval between January 1st 2022 and July 1st 2024 who presented in the County Clinical Emergency Hospital Bihor, who had histopathologic evidence of colorectal cancer.

**Results:** From the total number of 100 patients included in the study 57 were males and 43 were females and the the mean age at diagnosis of colorectal cancer was between 61-70 years old (41%).

**Conclusions:** This study aims to provide valuable insights into how sex, age, environment, the histopathological result, TNM classification and survival interact to influence colorectal cancer characteristics and outcomes in Bihor County, Romania.

**Keywords:** colorectal cancer, population, TNM classification, stage of diseases, survival

## INTRODUCTION

Colorectal cancer is one of the most common cancers both worldwide and in our country. This pathology ranks 3rd in the ranking of the most common oncologic diagnoses, being the third most common cancer among men, after bronchopulmonary and prostate cancer and the second most common cancer among women, after breast cancer both at the World and national levels [1–3]. The number of new cases reported in 2020 at the World level was 1.9 million, and in our country in 2020 about 98,886 new oncological cases were diagnosed, of which about 13,000 cases were due to colorectal tumors [1,2].Thus, this type of cancer accounts for 13.1% of all cancers in Romania, according to statistics from the International Agency for the Fight Against Cancer cited by the Coalition of Organizations of Patients with Chronic Diseases in Romania (COPAC) [2,4].Colorectal cancer mortality is also high, Romania occupying the 9th place at the World level, mainly among males [1].

Most studies have shown that the incidence of colorectal cancer is higher after the age of 50, and in terms of gender, men are more commonly affected than women [1,3–6]. This is thought to be due to men's unhealthier lifestyles, with a diet rich in red meat, more alcohol consumption, more smoking, a sedentary lifestyle and, last but not least, abdominal fat storage [1,7–9].

Histopathologically, the most common types of colorectal tumors are adenocarcinomas, which account for about 98% of all cases detected at this level [10]. The remaining 2% are represented by: low-grade tubuloglandular adenocarcinoma, neuroendocrine tumors and large cell and small cell neuroendocrine carcinomas [10].

Regarding the location of the tumor, apparently those located in the rectum are more common than those in the colon [4,11,12].

### Aim and objectives

The main purpose of our study is to establish prevalence and distribution of colorectal malignancies among people of Bihor County, Romania and to identify the survival according to TNM classification, respectively the stage of disease.

## MATERIAL AND METHODS

We aimed for analytical, observational, retrospective study. We included 100 patientes collected in a time interval between January 1st 2022 and July 1st 2024 who presented in the, County Clinical Emergency Hospital Bihor, who had histopathologic evidence of colorectal cancer and who presented to 4 specific doctor of oncology and radiotherapy specialisation. For each patient we collected demographic data as: age, gender, residence, localization of the tumor, histopathological type, tumoral grading, TNM classification and survel. The Research Ethical Approval for the study conducted was granted by the Ethics Comitee of Clinical Emergency Hospital County Bihor, Nr 39653/15.11.2023. We also with the help of Cancer Registry of the above- mentioned Hospital we noticed a downward trend regarding the number of new cases of colorectal cancer in all the Hospitals in Bihor County, namely in 2022 there were 2445 new cases and in 2023- 2280 new cases.

All the data, were introduced in Microsoft Excel, quantitative and categoricale variables (nominal and ordinal) and then with Statistical Package for Social Sciences (SPSS), version 26 we obtained all the results. For categorical variable crosstabulation tables, Chi-square test, Pearson Coeffcient Correlation, Fiecher test, Eta Coefficient, frequency tables were applied and for quantitative variable, mean, median, standard derivations, One way Anova were calculated. Cut off value p<0.05, at a confidence interval of 95% (numerical variables).

**RESULTS**

From the total number of 100 patients included in the study 57 were males and 43 were females and the the mean age at diagnosis of colorectal cancer was between 61-70 years old (41%) (Table I and Table II). For 55 patients living environment was the urban place and 45 was rural place (Tabel 2). Regarding to the localization of colorectal tumors, we classified into: cecum, ascending colon, transverse colon, descending colon, sigmoid, upper rectum, middler rectum and lower rectum and the most affected part was the middle rectum (17%).

Table I. Absolute and percentage distribution by age

| Age | N% |
|---|---|
| 31-40 | 2(2%) |
| 41-50 | 4(4%) |
| 51-60 | 17(17%) |
| 61-70 | 41(41%) |
| 71-80 | 30(30%) |
| 81-90 | 6(6%) |

Table II. Absolute and percentage distribution by sex, environmental and survival of colorectal cancer

| Sex | N% | Environmental | N% | Survival | N% |
|---|---|---|---|---|---|
| Male | 57(57%) | Urban | 55(55%) | Yes | 89(89%) |
| Female | 43(43%) | Rural | 45(45%) | No | 11(11%) |

In terms of histopathologic finding, adenocarcinomas were the most frequently reported representing 95% of all cases. According to TNM classification, the stage of colorectal cancers most common diagnosed in our study was IIA. From the point of view of of patient survival 89% of patients survived and 11% died (Tabel 2).

We tried to highlight a link between tumor location and sex, so that among females the lower rectal cancer was more common compared to males where the middle rectal cancer was more common, but without a p statistically significant (p= 0.382) (Table III).

Table III. Absolute and percentage distribution by sex and localization of colorectal cancer. p-values refer to the chi-square test for between-group differences. P value =0.382

| Sex | Male | Female |
|---|---|---|
| Localization | N % | N % |
| Cecum | 4(4%) | 3(3%) |
| Ascending colon | 3(3%) | 3(3%) |
| Transverse colon, | 10(10%) | 5(5%) |
| Descending colon, | 8(8%) | 3(3%) |
| Sigmoid | 8(8%) | 5(5%) |
| Upper rectum, | 5(5%) | 10(10%) |
| Middler rectum | 12(12%) | 5(5%) |
| Lower rectum | 3(3%) | 2(2%) |

We sought to examine the relationship between sex and age at the time of colorectal cancer diagnosis. Our findings indicated that both sexes were affected within the 61-70 age range. However, the results were not statistically significant, with a p-value of 0.809 (Table IV).

Table IV. Absolute and percentage distribution by sex and age of colorectal cancer. p-values refer to the chi-square test for between-group differences. P value = 0.809

| Age | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 |
|---|---|---|---|---|---|---|
| Sex | | | | | | |
| Male | 1(1.8%) | 1(1.8%) | 11(19.3%) | 24(42.1%) | 17(29.8%) | 3(5.3%) |
| Female | 1(2.3%) | 3(7%) | 6(14%) | 17(39.5%) | 13(30.2%) | 3(7%) |

Table V. One way Anova test: the survival is link to age.

| Survival | | | | | |
|---|---|---|---|---|---|
| | Sum of Squares | df | Mean Square | F | Sig. |
| Between Groups | 4.834 | 38 | 0.127 | 1.566 | *0.058* |
| Within Groups | 4.956 | 61 | 0.081 | - | - |
| Total | 9.790 | 99 | - | - | - |

We also wanted to find a link between survival and patient's age (Table V), respectively TNM classification, the stage of diseases. The relation between age and survival of patients according to the tests performed is confirmed by a statistically significant p (p=0.058). We have demonstrated that histopathologic type is related to survival, better said adenocarcinomas have a higher survival rate than other histopathological types of colorectal cancer (Tabel 6). We also observed a link between survival and disease stage, in other words the lower the disease stage, the higher the survival rate is (Table 7).

Table VI. Absolute and percentage distribution by survival and histopathological type of colorectal cancer. p-values refer to the chi-square test for between-group differences. P value =0.072

| | Histopathologic type | | | |
|---|---|---|---|---|
| Survive | Adenocarcinoma | GIST | Malign Melanoma | Neuroendocrin tumor with big cell |
| No | 10 (10%) | 0 (0%) | 0 (0%) | 1 (1%) |
| Yes | 87 (87%) | 1 (1%) | 1 (1%) | 0 (0%) |

Table VII. Absolute and percentage distribution by survival and stage of colorectal cancer. p-values refer to the chi-square test for between-group differences. P value =0.004

| | Stage of colorectal cancer | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Survival | I | II A | II B | II C | III A | III B | III C | IV A | IV C |
| No | 1 (1%) | 0 (0%) | 1 (1%) | 1 (1%) | 0 (0%) | 1 (1%) | 3 (3%) | 3 (3%) | 1 (1%) |
| Yes | 11 (11%) | 28 (28%) | 3 (3%) | 3 (3%) | 2 (2%) | 24 (24%) | 15 (15%) | 3 (3%) | 1 (1%) |

**DISCUSSIONS**

Colorectal cancer is one of the most common cancers both worldwide and in our country. This pathology ranks 3rd in the ranking of the most common oncologic diagnoses, being the third most common cancer among men, and the second most common cancer among women, both at the World and national levels [1,10,13]. Men are slightly more likely to develop colorectal cancer than women. This was also noted in our study, where males were more frequently affected than females in percentages of 57% versus 43%.

In our study it was also noted that the diagnosis of colorectal cancer was significantly more frequently diagnosed in patients aged between 61-70 years (41%), so, similar to the studies presented so far in the literature, the age over 50 years is more predisposed to the development of this oncologic pathology [1,9]. On the other hand, we also noted an earlier predisposition among young people, 6% of all our cases were in the 30-50 age group and paradoxically at the opposite pole of age, 6% of all patients included in the study were aged between 81-90 years.

Higher incidence rates are observed in high-income countries, including the United States, Australia, and parts of Europe, largely due to lifestyle factors [1,5,6,8,9]. Lower rates are generally seen in Africa and South-Central Asia, but these regions are experiencing an increase in incidence due to lifestyle changes [8,9]. From this point of view we have also noted a higher incidence of this pathology among patients from urban areas (55%) compared to rural areas (45%).

Referring to the histopathologic type of the tumor, adenocarcinomas are the most common representing in the literature about 98%, the rest being represented by neuroendocrine tumors, gastrointestinal stromal tumors and Non-Hodgkin tumors [11]. Of note, 97% of all colorectal cancers in our study were adenocarcinomas and the rest were represented by large cell neuroendocrine tumor, GIST and malignant melanoma.

According to studies in the literature, colorectal cancer can occur in any region, but a predisposition has been noted for the sigmoid and rectum [11]. In line with the above, a predisposition for colorectal tumors in the rectum of about 43% and 13% for sigmoid tumors was also noted in our data.

The stage of disease at diagnosis according to literature sources is over 60% in locally advanced and metastasized stages [11,14]. We note a proportion of 56% of all cases included in our data in these stages (III-IV) and 44% in early stages (I-II).

The prognosis of this oncologic pathology is not good, about 5 year survival is 40% - 60%, and most recurrences occur are within 2 years [9,10]. Similarly at 2 years, 1 year and 6 months respectively, from diagnosis 89% of patients survive, only 11% are deceased.

In our study we tried to show, that also in In Bihor County, Romania, especially in County Clinical Emergency Hospital Bihor, the data from colorectal cancer have a statistically significant relationship and agreement with the data in the literature. The most obvious and important finding was the link between stage of the disease and survival rate with significant statistically impact (p <0.04). The stage of the disease is inversely proportional to the survival rate, early stages of colorectal cancer have a higher survival rate than locally advanced or metastasized stages.

Our study also has demonstrated a significant correlation between histopathologic type and survival in colorectal cancer patients, particularly noting that adenocarcinomas are associated with a higher survival rate compared to other histopathological types. Additionally, we observed a strong link between survival and disease stage, confirming that the lower the stage at diagnosis, the higher the survival rate. These findings emphasize the importance of early detection and accurate histopathological assessment in improving patient outcomes.

## CONCLUSIONS

This study aims to provide valuable insights into how sex, age, environment, the histopathological result, TNM classification and survival interact to influence colorectal cancer characteristics and outcomes in Bihor County, Romania. By understanding these relationships, healthcare providers can tailor screening and prevention strategies to better meet the needs of specific populations. These findings could also contribute to Romania country and to the global understanding of colorectal cancer epidemiology, ultimately improving patient care and survival outcomes.

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