

Online ISSN: 2682-2628
Print ISSN: 2682-261X

IJC CBR

INTERNATIONAL JOURNAL OF CANCER AND BIOMEDICAL RESEARCH

<https://jcbr.journals.ekb.eg>

Editor-in-chief

Prof. Mohamed Labib Salem, PhD

Epidemiology of colorectal cancer in rural population

Saeed M. Shaaban and Sarah Hamdy



PUBLISHED BY

EACR EGYPTIAN ASSOCIATION
FOR CANCER RESEARCH

Since 2014

Epidemiology of colorectal cancer in rural population

Saeed M. Shaaban and Sarah Hamdy

Clinical Oncology Department, Faculty of Medicine, Beni-Suef University, Egypt

ABSTRACT

Background: Colorectal cancer (CRC) is the third most common cancer. In Africa, colorectal cancer incidence is 5.7% with slightly higher female incidence, while worldwide it is higher in men. CRC incidence is higher in high socioeconomic people due to changes in lifestyle, so incidence in developed countries is higher than in Africa, especially rural populations. **Aim:** The aim is to prove epidemiology and clinical data of CRC in the rural population. **Materials & Methods:** Our study was conducted in Beni-Suef, Egypt. The data was collected from 2017 to the end of 2021. 199 patients had CRC. Gender, age, site, presentation, staging, family history, special habits and histopathology were gotten. **Results:** Colorectal cancer accounted for 6.1% of all newly diagnosed cancer patients with 2.6/100.000 population and ranked the sixth common malignancy. The median age was 48.5 years for females and 40 for males with range (19 to 75 years). The incidence was slightly higher in the female with female to male ratio is 1.18:1. Stage 3 was the most common stage (48.2%) and constipation was the most frequent presentation (34%). About one-third of patients were diagnosed younger than 40 years. In males, rectal was the most common side, while the left side was the most common in females. **Conclusion:** CRC incidence is lower than in developed countries and more common in females than males while in developed countries male incidence is higher. A more advanced stage is found, also a higher young age incidence of CRC in the rural population.

Keywords: colorectal; colon; rectum; cancer, incidence; rural

ARTICLE INFO

Article history

Received: January 18, 2023

Revised: February 25, 2023

Accepted: March 10, 2023

Correspondence to

Saeed M. Shaaban, MD

Clinical Oncology, Faculty of Medicine,

Beni-Suef University, Egypt

Tel.: 00201021163990

Email:

saeedalbehairy@med.bsu.edu.eg

Copyright

©2023 Saeed M. Shaaban and Sarah Hamdy. This is an Open Access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any format provided that the original work is properly cited.

Editor-in-Chief: Prof. M.L. Salem, PhD - Article DOI: 10.21608/IJCBR.2023.188360.1291

INTRODUCTION

Colorectal cancer (CRC) is one of the most common malignancies representing about 9.8% of newly diagnosed cancer patients worldwide and is ranked the third most common malignancy after female breast and lung cancer. Colon cancer accounts for 6% of new cancer patients while rectal cancer represents 3.8%. In Africa, colorectal cancer incidence is 5.7% in both sexes with slightly higher female incidence 6.9% versus 4.7% in males while worldwide it is more common in men (Sung et al., 2021). Colorectal cancer incidence is higher in high socioeconomic people due to changes in lifestyle including high consumption of red meat, fatty meals, alcohol, and smoking, so incidence in developed countries such as in Europe and USA is higher than in Africa. Colorectal cancer is the second cause of cancer-related mortality in both sexes (9.2%) after lung cancer. Colon mortality is 5.8% while rectum is 3.4% (Lewandowska et al., 2022).

Age is a major risk factor for sporadic CRC. The median age at CRC diagnosis is 66 years in men and 69 years in women but is younger for rectal cancer (age 62 and 63, respectively) than for colon cancer (age 67 and 71, respectively) (Siegel et al., 2017). CRC patients overall are increasingly younger, shifting from a median age of 72 years for diagnoses in the early 2000s to 66 years in 2019 (Howlader et al., 2020). CRC incidence is uncommon under the age of 40 but recent data reported a rising in CRC incidence among young adults, commonly left side colon cancer and rectal cancer (Tawadros et al., 2015). By site and stage, a study by Mark et al showed that right colon cancer represents about 52% and left side 48%, AJCC CC stage distributions were 24.1% stage I, 27.3% stage II, 28.2% stage III, and 20.4% stage IV, and the right-side colon cancer was associated with higher T stage and nodal status (Ulanja et al., 2019).

Patients and METHODS

Subjects

This is a retrospective observational study with data collected from archived files at the clinical oncology department, faculty of medicine, Beni-Suef University, Egypt. The information was collected from all colorectal cancer patients who were diagnosed between the start of January 2017 and to end of December 2021. The study collected data involving gender, age, site of cancer, and staging. TNM staging system was used for staging. To calculate the incidence of the colorectal cancer in Beni-Suef we noticed that half of people at our government has insurance and treated at health insurance hospital while 50% of all Beni-Suef citizens are not covered medically covered by insurance and if one them developed malignancy was treated at clinical oncology department of Beni-Suef University, so we divided newly diagnosed colorectal cancer patients on 50% of Beni-Suef citizens. For annual incidence we calculated all newly diagnosed cancer patients who came to our department and number of newly diagnosed colorectal cancer to decide if there is rising in the incidence or not.

Statistical Analysis

Data was coded to fit the program of statistical analysis (SPSS) Statistical package for special sciences version 26 under Windows 7. A random sample of 10% of potential participants was selected and reviewed to ensure an adequate quality of data. For statistical analysis description of qualitative variables was by frequency and percentage. Chi-square (X²) test was used for the comparison of qualitative variables with each other. Comparison between quantitative variables had been carried out by using paired t-tests of two independent samples. For more statistical analysis, suitable statistical tests of significance were used. P-Values <0.05 was statistically significant.

RESULTS

In this retrospective study, from 3260 cancer patients, 199 colorectal patients were included, 108 female patients (54.3%) and 91 male (45.7%) with a female-to-male ratio of 1.17:1 (Table 1). Colorectal cancer accounted for 6.1% of all newly diagnosed cancer patients with

2.6/100.000 population and ranked the sixth common malignancy.

The median age was 48.5 years for females and 40 for males and the age range was 19 to 75 years (Figure 1). Constipation was the most frequent presentation (34%) followed by abdominal pain (24.5%), bleeding per rectum (21.3%) and intestinal obstruction was present in 7.4%.

Table 1. Colorectal cancer criteria

Variables	N (%)
All cancer types	3260(100%)
Colorectal cancer	199(6.1%)
Gender	199(100%)
Female	108(54.3%)
Male	91(45.7%)
Age	
< 40 years	64(32.2%)
≥ 40 years	135(67.8%)
Presentation	
abdominal pain	(24.5%)
anemia	(3.2%)
bleeding per rectum	(21.3%)
constipation	(34%)
diarrhea	(3.2%)
distension	(3.2%)
Intestinal obstruction	(7.4%)
Vomiting	(3.2%)
Site	
Right	62(31.2%)
Transverse	6(3%)
Left	64(32.25%)
Rectum	67(33.7%)
Stage	
Stage 1	4(2%)
Stage 2	43(21.6%)
Stage 3	96(48.2%)
Stage 4	56(28.2%)
Alcohol consumption	
No	199(100%)
Yes	0(0%)
Smoking:	
No	159(79.9%)
Yes	40(20.1%)
Family history	
Yes	11(5.5%)
No	185(93%)
Unknown	3(1.5%)
Year of diagnosis	
2017	32(16%)
2018	35(17.6%)
2019	39(19.6%)
2020	45(22.6%)
2021	48(24.2%)
Histopathology	
Adenocarcinoma NOS	175(88%)
Mucinous	19(9.5%)
Signet ring	5(2.5%)

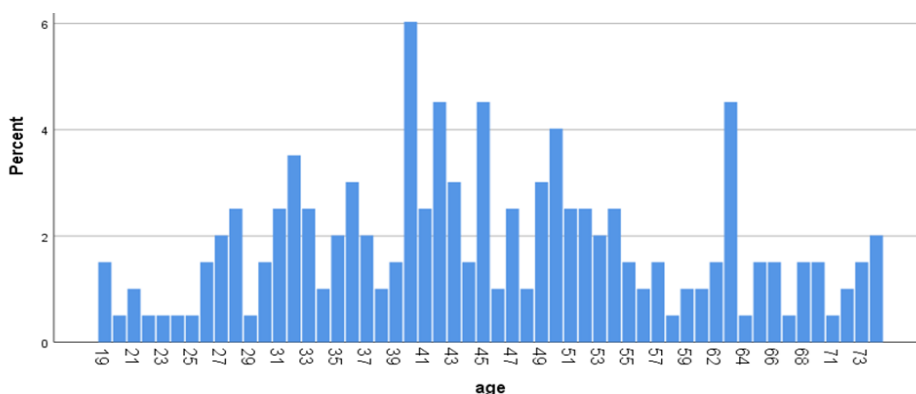


Figure 1. Age distribution of colorectal cancer in Beni-Suef.

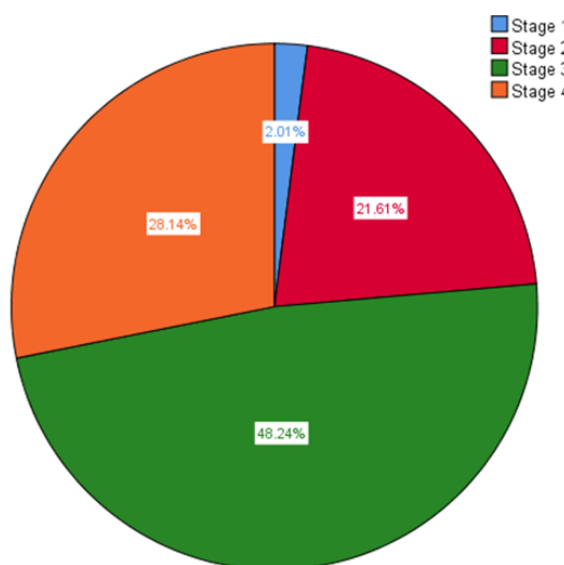


Figure 2. Stage of colorectal cancer in Beni-Suef.

Table 2. Stage and site subgroup analysis of Colorectal cancer

		Stage 1	Stage 2	Stage 3	Stage 4	Total	P-Value
Site	Right	1 _a	15 _a	23 _a	23 _a	62	.001*
	Transverse	0 _{a, b}	5 _b	1 _a	0 _{a, b}	6	
	Left	2 _a	16 _a	27 _a	19 _a	64	
	Rectum	1 _{a, b, c}	7 _c	45 _b	14 _{a, c}	67	
Total		4	43	96	56	199	

Each subscript letter denotes a subset of stage categories whose column proportions do not differ significantly from each other at the .05 level.

Table 3. Gender subgroup analysis

Variables	Male		Female	
	N=91	Percent (%)	N=109	Percent (%)
Site:				
Right	27	29.7	35	32.4
Transverse	4	4.4	2	1.9
Left	27	29.7	37	34.3
Rectum	33	36.3	34	31.5
Stage:				
Stage 1	0	0	4	3.7
Stage 2	18	19.8	25	23.1
Stage 3	47	51.6	49	45.4
Stage 4	26	28.6	30	27.8

The incidence of stage 1 was 2%, stage 2 was 21.6%, stage 3 was 48.2% and stage 4 was 28.2% (Figure 2). According to the site of disease, the right side was 31.2%, transverse 2%, the left side 32.2 and the rectum 33.7%. About 20% of CRC patients were cigarette smoking but none were alcohol consumption. Family history of CRC is positive in 5.5% only. The CRC increased yearly with the highest in 2021(24.2%) of all CRC patients in the last 5 years. Adenocarcinoma is the most common histopathologic subtype (88%) (Table 1).

In site subgroup analysis, lower stages 1&2 in the rectal and right colon compared with the left side and transverse colon with higher stage 4 in the right side and higher stage 3 in rectal cancer with a significant P-value 0.001(Table 2). In gender subgroup analysis, female CRC patients had a higher percentage of early stages (1&2) (26.8%) compared to 19.8% in males, the left side is the most common site in females (34.3%) but in males, the rectum is the most common site (36.3%) (Table 3).

DISCUSSION

The rural population represents about 75% of the Beni-Suef governorate and most of them have no health insurance coverage and have low socioeconomic income, if have medical oncology problems they receive treatment at the clinical oncology department of the faculty of medicine of Beni-Suef University. There is a lack of screening programs for early detection of colorectal cancer in the rural population so they have a low incidence rate of 2.8/ 100.000 population compared with 70.6 in Hungary and 28.8 in the USA and in Egypt including urban and rural populations is 6.3 (Rawla et al., 2019).

In this study, they are a trend towards increasing incidence of CRC in young age with patients < 40 years of about 32.2% which is so higher than the worldwide incidence in young age as reported by some studies about 9-11% in adults younger than 50 years (Ellis et al., 2018). According to Globocan 2020 database, the incidence rate increased by approximately 2% annually for tumors in the proximal and distal colon, as well as the rectum among individuals aged younger than 50 years (Siegel et al., 2020).

CRC is slightly higher in females than males in rural populations which is similar to African data and controversial to developed countries data where CRC is more common in men with CRC incidence rates being 30% higher in men than in women (Sung et al., 2021). The median age for CRC in rural populations is so younger in both sexes (men 40 years and women 48 years) compared to developed countries as the USA where the median age for CRC diagnosis is 66 years in men and 69 years in women (Sung et al., 2021).

Rectal cancer is more common in men than women whereas colon cancer is more common in women which is similar to published international studies such as Siegel et al study which reported that rectal cancer incidence is higher in men by 30% than in women, and another study by McDevitt et al showed that rectal cancer was higher in men with incidence 31% versus 24% in women (McDevitt et al., 2017). The advanced stage of CRC is so much higher (28.2%) than reported in developed countries and some developing countries such as Iraq where stage 4 was about 15% and about 20% in Mark et al study (Alhilfi et al., 2019). Family history of CRC is positive in 5.5% which is so lower than reported in the USA, as it was about 30% (Siegel et al., 2020).

CONCLUSION

The rural population has a lower incidence rate of CRC but a higher incidence in younger ages <40 years with higher women incidence and more advanced stage. Screening programs for early detection of CRC in the young population should be encouraged.

CONFLICTS OF INTEREST

There are no competing interests between the authors.

FUND

The study is self-funded.

REFERENCES

- Alhilfi, H.S., Almohammadawi, K.O., Alsaad, R., Ameen, N.A., Aliedani, B.K., Aldubaisi, H.J., & Alshewered, A.S. (2019). Colorectal cancer epidemiology and clinical study in Misan. *Journal of Coloproctology*.

- Ellis, L., Abrahão, R., McKinley, M., Yang, J., Somsouk, M., Marchand, L. L., Cheng, I., Gomez, S. L., & Shariff-Marco, S. (2018). Colorectal Cancer Incidence Trends by Age, Stage, and Racial/Ethnic Group in California, 1990-2014. *Cancer Epidemiology, Biomarkers & Prevention: a Publication of the American Association for Cancer Research, Cosponsored By the American Society of Preventive Oncology*, 27(9), 1011-1018. <https://doi.org/10.1158/1055-9965.EPI-18-0030>.
- Howlader N, Noone AM, Krapcho M, Miller D, Brest A, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds).(2020). SEER Cancer Statistics Review, 1975-2017, National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/csr/1975_2017/, based on November 2019 SEER data submission, posted to the SEER web site, April 2020.
- Lewandowska, A., Rudzki, G., Lewandowski, T., Strykowska-Góra, A., & Rudzki, S. (2022). Title: Risk Factors for the Diagnosis of Colorectal Cancer. *Cancer control: journal of the Moffitt Cancer Center*, 29, 10732748211056692. <https://doi.org/10.1177/10732748211056692>.
- McDevitt, J., Comber, H., & Walsh, P. M. (2017). Colorectal cancer incidence and survival by subsite and stage of diagnosis: a population-based study at the advent of national screening. *Irish journal of medical science*, 186(1), 113–121. <https://doi.org/10.1007/s11845-016-1513-8>.
- Rawla, P., Sunkara, T., & Barsouk, A. (2019). Epidemiology of colorectal cancer: incidence, mortality, survival, and risk factors. *Przeegląd gastroenterologiczny*, 14(2), 89–103. <https://doi.org/10.5114/pg.2018.81072>.
- Siegel, R. L., Fedewa, S. A., Anderson, W. F., Miller, K. D., Ma, J., Rosenberg, P. S., & Jemal, A. (2017). Colorectal Cancer Incidence Patterns in the United States, 1974-2013. *Journal of the National Cancer Institute*, 109(8), djw322. <https://doi.org/10.1093/jnci/djw322>.
- Siegel, R. L., Miller, K. D., Goding Sauer, A., Fedewa, S. A., Butterly, L. F., Anderson, J. C., Cercek, A., Smith, R. A., & Jemal, A. (2020). Colorectal cancer statistics, 2020. *CA: a cancer journal for clinicians*, 70(3), 145–164. <https://doi.org/10.3322/caac.21601>.
- Sung, H., Ferlay, J., Siegel, R. L., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2021). Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. *CA: a cancer journal for clinicians*, 71(3), 209–249. <https://doi.org/10.3322/caac.21660>.
- Tawadros, P. S., Paquette, I. M., Hanly, A. M., Mellgren, A. F., Rothenberger, D. A., & Madoff, R. D. (2015). Adenocarcinoma of the rectum in patients under age 40 is increasing: impact of signet-ring cell histology. *Diseases of the colon and rectum*, 58(5), 474–478. <https://doi.org/10.1097/DCR.0000000000000318>.
- Ulanja, M. B., Rishi, M., Beutler, B. D., Sharma, M., Patterson, D. R., Gullapalli, N., & Ambika, S. (2019). Colon Cancer Sidedness, Presentation, and Survival at Different Stages. *Journal of oncology*, 2019, 4315032. <https://doi.org/10.1155/2019/4315032>.