

Research Article

Clinico – Epidemiological Study on Colorectal Cancer through El-Minia Governorate during the Years 2015 – 2019



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Abstract

Background: Colorectal cancer ranks the 7th among both genders, accounting for about 5% of all malignant tumors, according to Globocan statistics, for exploring the cancer burden in Egypt, 2020. Studies on the epidemiology of colorectal cancer in Minia Governorate - one of the densely populated areas in upper Egypt -are very limited. **Purpose:** This study intends to highlight the Clinicoepidemiological aspects of colorectal cancer in Minia Governorate. **Methods:** a retrospective study of all colorectal cancer patients from Minia Governorate who were diagnosed from January 2015 to December 2019. The study included all patients having histopathologically proven colon, rectal and colorectal cancer. The study has been conducted at different oncology treatment centers in Minia Governorate including Minia university hospital, Minia oncology center, general authority of health Insurance and different private cancer treatment centers and Minia residents treated in Assuit university hospital. All data were studied as regards to epidemiological, clinical, pathological parameters. Data analysis was carried out using IBM Statistical Package for Social Sciences software (SPSS). **Results:** there were 660 patients with colorectal cancer from Minia Governorate during the years 2015-2019, representing an incidence of 4.89% of all cancers. Male to Female ratio was 1:1.12. Mean age at diagnosis was 49 years. Minia, Abu Qurqas and Samalout had the highest number of cases 159, 104,100 cases respectively. Ascending colon, rectum and sigmoid colon represented the most common subsites (17.42%), (16.82%), (15.45%) respectively. **Conclusions:** our results support evidence that there was higher female to male ratio having colorectal cancer which may due to environmental and/or lifestyle factors.

Keywords Colorectal cancer, young onset CRC, Clinical and epidemiological patterns of Colorectal cancer, Colorectal cancer in Minia Egypt.

Introduction

In Egypt there is no available unified population-based cancer registration system, to provide valid, accurate and timely information on epidemiological aspects for different types of cancer which is essential for researchers and policy makers to conduct research and create effective decisions in cancer prevention and in monitoring trends and treatment outcomes.

Colorectal cancer ranks 7th among both genders, accounting for about 5% of all malignant tumors, according to the Egypt-Global cancer observatory (Globocan) statistics, for exploring the cancer burden in Egypt, 2020 (Sung, Ferlay et al., 2021)

Despite these high numbers, recent data showed continued decline in incidence among those aged 65 years or older. with a decrease of 3.3% annually between 2011 and 2016. Incidence has increased among those younger than 65 years. with a 1% annual increase in those aged 50 to 64 years and 2% annual increase in those younger than 50 years. It's estimated that the incidence rates for colon and rectal cancers will increase by 90.0% and 124.2%, respectively, for patients 20 to 34 years of age by 2030. (Siegel and Miller 2020)

It's suggested that CRC that occurs in young adult patients may be clinicopathologically and

genetically different from CRC in older adults, However the pattern of disease presentation in young patients remains under investigation. (Mauri, Sartore-Bianchi et al., 2019)

Moreover, studies on the epidemiology of colorectal cancer in El-Minia governorate are very limited. Therefore, this study intent to highlight the clinico-epidemiological aspects of colorectal cancer in El-Minia Governorate, which is one of the densely populated areas in Upper Egypt to direct attention towards the clinico epidemiological factors related to the incidence, patterns, classifications, treatment outcomes and mortality rates in our patients.

Aim of the study:

This study intends to highlight the clinic-epidemiological aspects of colorectal cancer in Minia Governorate.

Materials and methods

This is a retrospective study that has been conducted at different oncology treatment centers in Minia Governorate including Minia university hospital, Minia oncology center, general authority of health Insurance, different private cancer treatment clinics and Assuit university hospital.

The retrospective patient records in the cancer treatment hospitals and private clinics in Minia Governorate as well as in the clinical oncology department in Assiut university hospital were reviewed between January 2015 and December 2019.

Patients with pathologically proven colon, rectal or colorectal cancer were included and registered in an electronic review form.

Inclusion criteria:

- Patients with histologically proven colorectal cancer who attended to the previously described cancer treatment hospitals/clinics from January 2015 to December 2019.
- Any age.
- Males and females.
- Residents of El-Minia Governorate.
- Any stage of colorectal cancer.
- Colorectal cancer patients irrespective of type of treatment received either radical or palliative treatment.
- Patients having adequate Clinico- epidemiological data registry documents.

Exclusion criteria:

- Patients with histologically proven colorectal cancer who attended to the previously described cancer treatment hospitals/clinics before January 2015 or after December 2019
- Patients without adequate clinico-epidemiological data registry documents.
- Patients with anal cancer.
- Non-residents of El-Minia Governorate.

The variables that were analyzed included:

- Age at time of diagnosis
- Gender.
- Residence.
- Occupation.
- Anatomical subsite.

Ethical approval:

The hospital ethical committee approved this study (approval number: 442:9/2022, date of approval 15th September 2022)

Data Analysis

Data was collected, coded then entered as a spreadsheet using Microsoft Excel 2016 for Windows, of the Microsoft Office bundle; 2016 of Microsoft Corporation, United States. Data analysis was carried out using IBM Statistical Package for Social Sciences software (SPSS), 21st edition, IBM, United States: inclusive variables were outlined by frequency and percentage tabulation and were illustrated by means of tables and bar charts. Also, variables were summarized by the mean, standard deviation, median range and their distribution illustrated by means of histograms.

Results were considered statistically significant at a p-value of less than or equal 0.05 and highly statistically significant at a p-value of less than or equal 0.01.

Data Confidentiality:

Patient's confidentiality was ensured, via the encrypt of all patient data. We addressed strict considerations that ensured the participant's identity, personal information. All patients' information were not disclosed to anyone outside of the research team.

Results

Seven hundred and eighty-six patients were detected in the registry documents of the participating cancer treatment hospitals and private clinics. After exclusion of patients without adequate data registry, having wrong

diagnosis or duplicate data, 660 patients have fulfilled the inclusion criteria and were included in our study which represented 4.89% of all incident cancers and age standardized incidence rate per 100,000 (ASR) 11.9. Table (1)

Out of those patients 311 (47%) were males and 349 (53%) were females representing 4.47% and 5.33% of male and female cancers respectively with male to female ratio of 1:1.12. Table (1), figure (1).

Registered colorectal cancer cases over the years 2015, 2016, 2017, 2018 and 2019 were 123, 127, 130, 134 and 146 respectively, accounting for 4.88%, 4.9%, 4.88%, 4.9% and 4.88% of 2015 – 2019 cancers respectively. Table (2)

Number of patients from Minia University Hospital was 66 (10%). Number of Minia patients treated in Assiut university hospital was 13 (1.97%). Number of patients of Health insurance hospital was 198 (30%), Number of patients of Minia Oncology Center was 370 (56.06%), Number of patients treated in El Minia private centers was 13 (1.97%). Table (3), figure (2)

The youngest registered age in the study population was 2 years old and the oldest was 93 years old with mean age 49.87 ± 15.18 . Age in males ranged from 6 to 90 years old with mean age in males 49.29 ± 15.08 . Age in females ranged from 2 to 93 years old with mean 50.4 ± 15.28 . Forty eight percent of the study group were less than 50 years old. Table (4) Figures (3-6)

The top 3 cities within Minia governorate which had the highest number of CRC patients were Minia city, Abu Qurqas city and Samalout city 159 (24.39%), 104 (15.95%), 100 (15.34%) cases respectively. table (5) figure (7).

Sixty three percent (422 patients) of the population had no job while 116 patients (17.58%) were farmers. Table (6). Figure (8)

Ascending colon, rectum and sigmoid colon represented the most common subsites of colorectal cancer among the study population 115 (17.42%), 111 (16.82%), 102 (15.45%) patients respectively. eighty three percent had colon cancer while 16.82% had rectal/rectosigmoid primary tumor. Forty five percent had left sided tumors while 30.61% had right sided tumors. Table (7), Figure (9)

Table (1): Total and Sex-specific Frequency and Age-standardized Incidence Rates of Colorectal Cancer per 100,000 Population, Minia, 2015 – 2019

	Frequency	% of Total cancer cases	ASR
Both Genders	660	4.89%	11.9
Males	311(47.12%)	4.47%	10.9
Females	349 (52.88%)	5.33%	13.0
Male: Female ratio	1: 1.12		

Table (2): Year-specific Frequency of Colorectal Cancer, Minia, 2015 – 2019

	Frequency	% of Total cancer cases
2015 – 2019	660	4.89 %
2015	123	4.88%
2016	127	4.90%
2017	130	4.88%
2018	134	4.90%
2019	146	4.88%

Table (3): Number of patients per institution among the study population

Institution	Study population (n = 660)
- Minia University Hospital	66 (10%)
- General Authority of health Insurance	198 (30%)
- Minia oncology Center	370 (56.06%)
- Minia residents treated in Assiut	13 (1.97%)
- Minia Private centers	13 (1.97%)

Table (4): Demographic characteristics among the study population

	Study population (n = 660)
Age (years)	
Mean \pm SD.	49.87 \pm 15.18
Median (IQR)	50 (39 - 61)
Range (Min-Max)	91 (2 - 93)
Age distribution	
- Less than 50 years	318 (48.18%)
- 50 years or more	342 (51.82%)
Mean age in males	
Mean \pm SD.	49.29 \pm 15.08
Median (IQR)	49 (39 - 60.5)
Range (Min-Max)	84 (6 - 90)
Mean age in females	
Mean \pm SD.	50.4 \pm 15.28
Median (IQR)	51 (40 - 61)
Range (Min-Max)	91 (2 - 93)

Table (5): Residence frequency among the study population

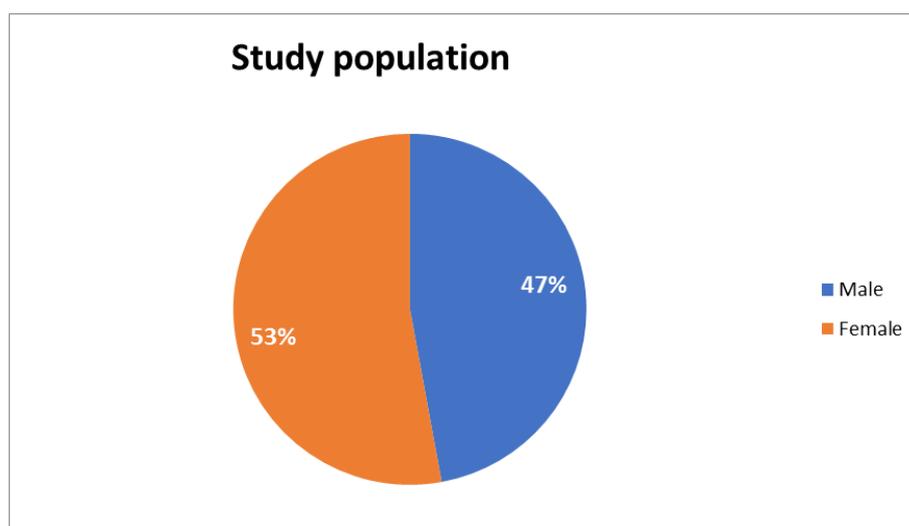
Residence	Study population (n = 660)
- EL-Minya city	159 (24.39%)
- Samalout	100 (15.34%)
- Matay	35 (5.37%)
- Bani Mazar	88 (13.50%)
- Maghagha	54 (8.28%)
- Abu Qurqas	104 (15.95%)
- Malawi	79 (12.12%)
- Dermawas	8 (1.23%)
- AL-Edwa	25 (3.83%)
- Residence outside El Minia	8 (1.21%)

Table (6): Occupation among the study population

Occupation	Study population (n = 660)
- No job	422 (63.94%)
- Farmer	116 (17.58%)
- Specialized professionals	56 (11.52%)
- Non specialized workers	30 (4.54%)
- Students	16 (2.42%)

Table (7): Colorectal cancer anatomical sub site among the study population

Anatomical subsite	Study population (n = 660)
- Colon NOS	127 (19.24%)
- Ascending	115 (17.42%)
- Sigmoid colon	102 (15.45%)
- Rectum	70 (10.61%)
- Descending colon	62 (9.39%)
- Caecum	46 (6.97%)
- Transverse colon	31 (4.70%)
- Hepatic flexure	30 (4.55%)
- Rectosigmoid	23 (3.48%)
- Anorectal	18 (2.73%)
- Splenic flexure	17 (2.58%)
- Rt colon NOS	11 (1.67%)
- Lt colon NOS	8 (1.21%)

**Figure (1:) Pie chart showing study population data regarding Sex**

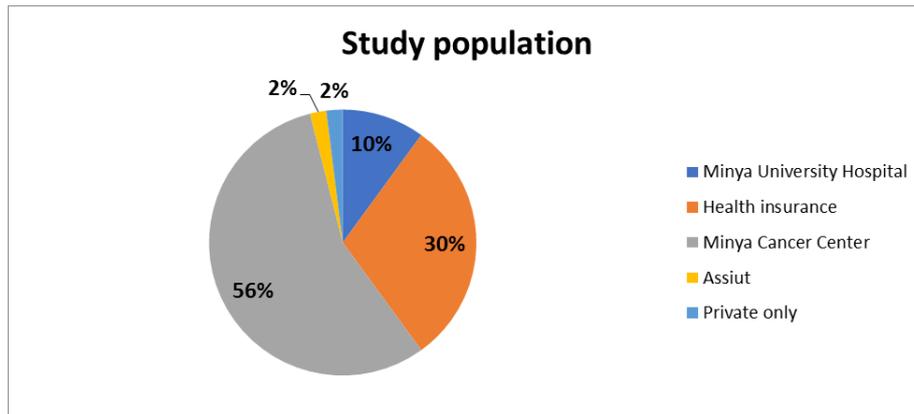


Figure (2): pie chart showing number of patients per institution

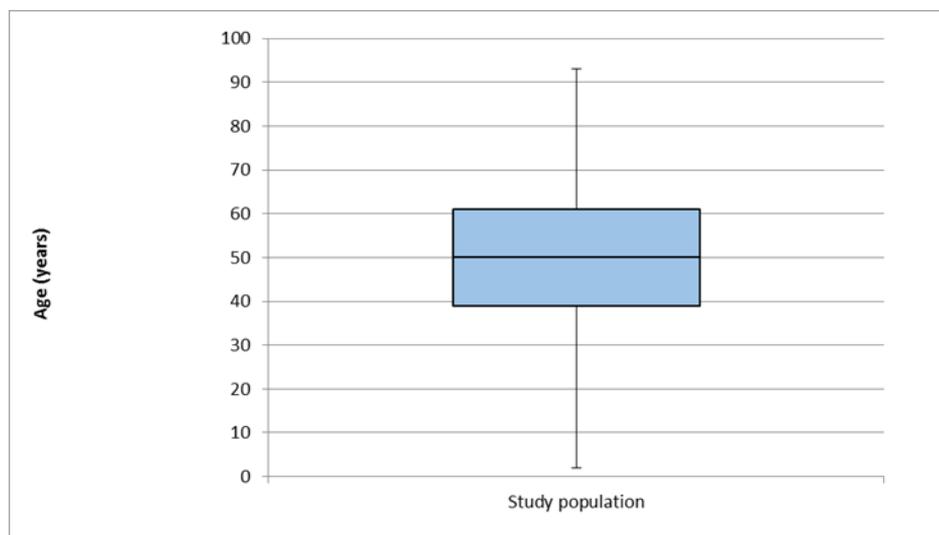


Figure (3): Box-plot showing study population data regarding Age (years).

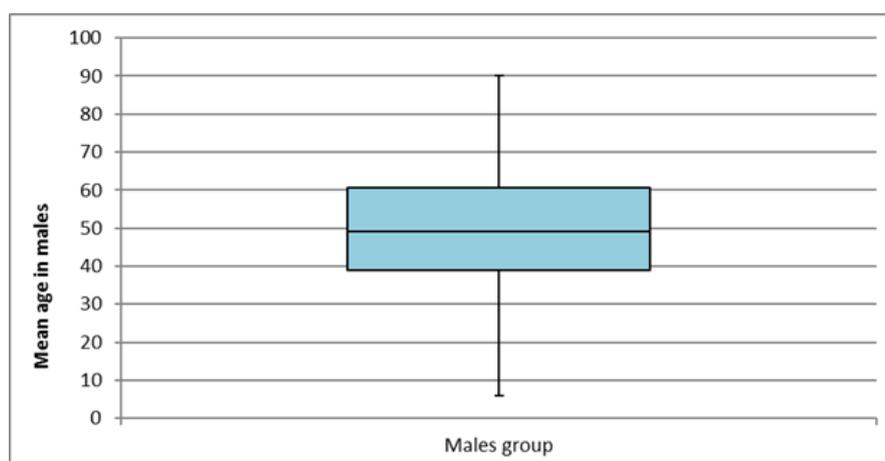


Figure (4): Box-plot showing study population data regarding Mean age in males.

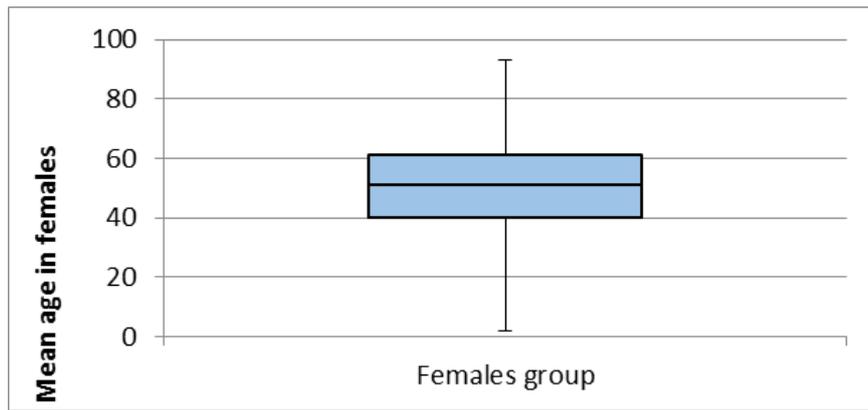


Figure (5): Box-plot showing study population data regarding Mean age in females.

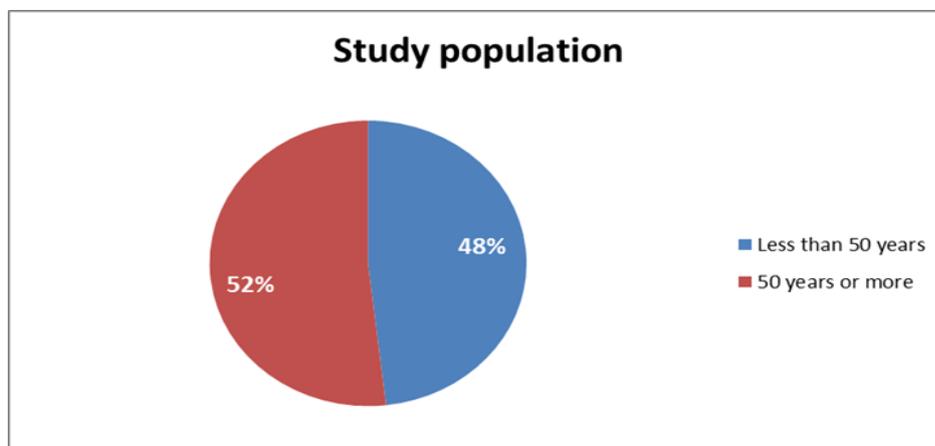


Figure (6): Pie chart showing study population data regarding Age distribution

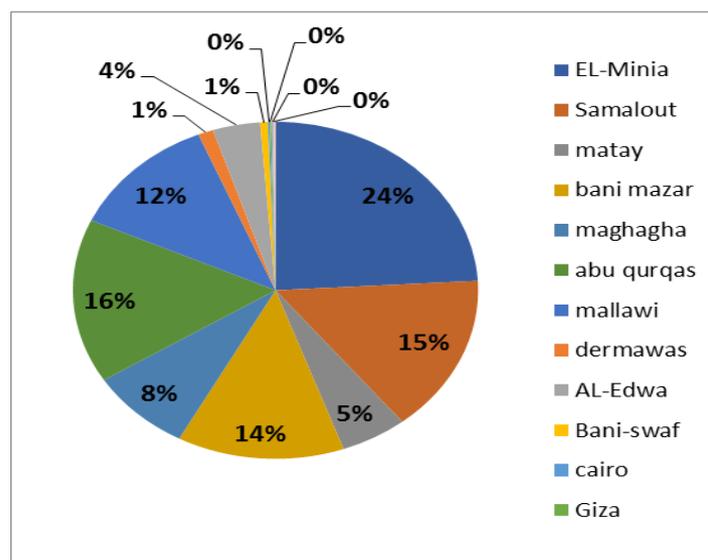


Figure (7): pie chart showing residence frequency among the study population

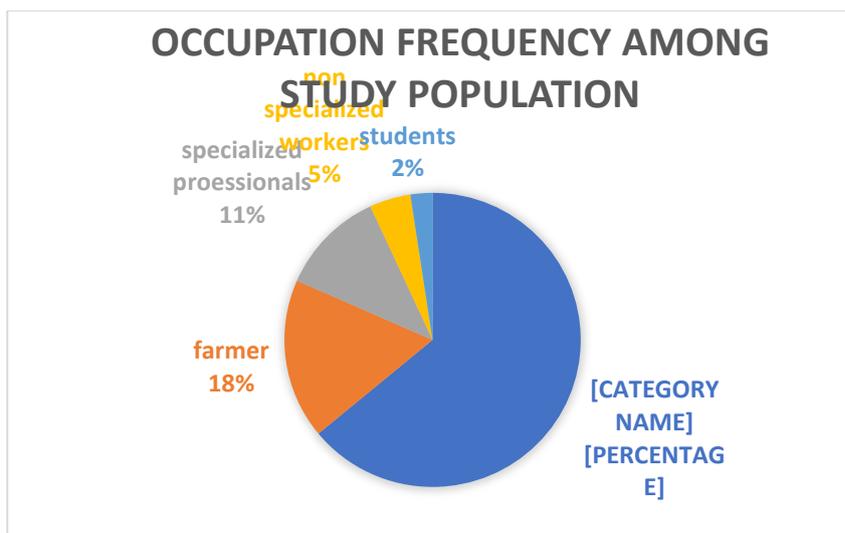


Figure (8): Bar chart showing study population data regarding occupation.

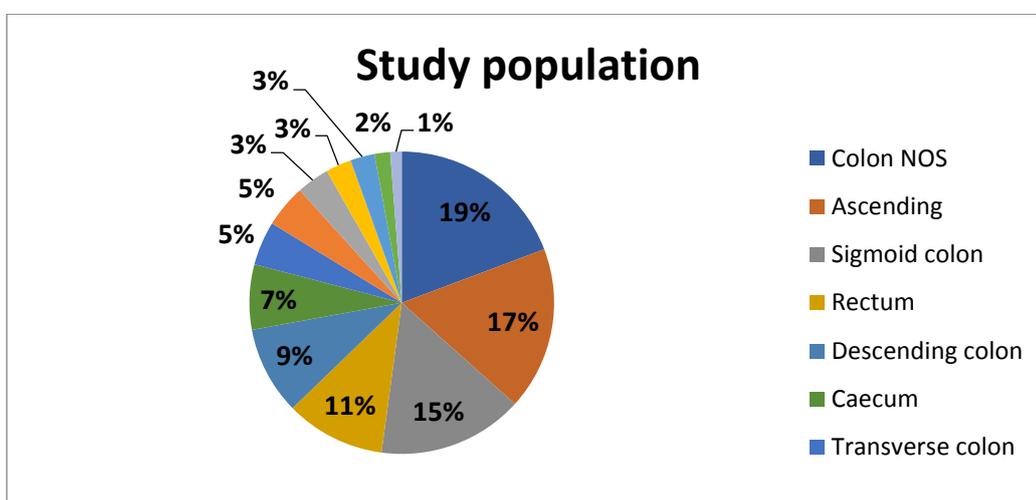


Figure (9): Pie chart showing study population data regarding colorectal cancer anatomical subsite.

Discussion

Our study included a total of 660 CRC patients during the years 2015-2019 with an average of 132 cases per year representing an incidence of 4.89% and ASR PER 100,000 of 11.9 .This is higher than the 3.3% incidence reported in Minia 2009 cancer center registry^[1], 4.8 ASR reported by the National Population-Based Cancer Registry Program in 2008–2011 ^[2] The 5.5 ASR Reported by the Gharbia population-based cancer registry from 1999-2007 ^[3], the 1.6% incidence reported in Menofia ^[4] and the 3.9% incidence estimated by Globocan Egypt 2020^[5] This is similar to our clinical observation of increased incidence of CRC in

Minia governorate. However, it is lower than the Age-standardized incidence rates per 100,000 of 19.7 reported in western countries^[6].

In our study, the mean age was 49.87 ± 15.18, this is consistent with similar studies of Egyptian CRC^[7-9], But younger than that reported in North America despite worldwide decline in the mean age of CRC.^[10, 11]

In our study 48 % of the population are less than 50 years old , in India a similar incidence of 45% was reported ^[12], Our incidence is higher than what was reported in Menofia where only 30% of the population were under

the age of 50 years^[4] and that reported in Iran where 39.4% of patients were < 50 years^[13].

This requires a thorough study of the possible underlying causes of this young onset colorectal cancer and the value of implementing a screening program at a younger age than that established by the national guidelines.

Fifty two percent of patients were females with a male to female ratio 1:1.2 this is consistent with other studies^[2,3,7,9], however it is contradictory to older studies where males predominated.^[3]

This high incidence and female predominance may be due to the more sedentary lifestyle (63% of the population were jobless) and exposure to pesticides (17% of the study population gave history of exposure to pesticides.^[14, 15]

The top 3 cities within Minia governorate which had the highest number of CRC patients were Minia city, Abu qurqas and Samalout 159 cases (24.39%), 104 cases (15.95%), 100 cases (15.34%) respectively. These cities have more urban life style which is consistent with other studies^[3, 4]

Ascending colon, rectum and sigmoid colon represented the most common subsites of colon cancer 115 (17.42%), 111 (16.82%), 102 (15.45%) respectively. Eighty three percent had colon cancer while 16.82% had rectal/rectosigmoid primary tumor. Forty five percent had left sided tumors while 30.61% had right sided tumors. this is in agreement with other studies; A recent study in upper Egypt reported 66% had a left-sided cancer while 34% had right-sided tumors. Fifty six percent had Colon cancer, while 43.3% had rectal/rectosigmoid cancer^[16], Veruttipong, et al., in Egypt reported right colon cancer represented 40.5%, left colon cancer 38.7% and 37.2% had rectal cancer^[3] Metwally, et al., reported that right colon represents the commonest site (about 48%), followed by sigmoid colon (about 27%)^[17] In comparison to the previous study in Minia there is an increase in the 2.8% incidence reported of ascending colon cancer^[1]

Conclusions

Incidence of Colorectal cancer in Egypt is rising with different epidemiological and clinical patterns from western ones. This requires

further wide scale testing of underlying genomic and molecular patterns.

List of Abbreviations:

CRC: colorectal cancer, Globocan: global cancer observatory statistics, ASR: age standardized incidence rates per 100,000

Competing Interests

The authors declare that they have no conflict of interests.

Author Contributions

All authors contributed to the study concept and design, material preparation, data collection and analysis. All authors read and approved the final manuscript.

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References

1. Ibrahim, A., et al., Egypt National Cancer Registry: El-Minia Profile 2009. Egypt National Cancer Registry, 2011.
2. Ibrahim, A.S., et al., Cancer Incidence in Egypt: Results of the National Population-Based Cancer Registry Program. Journal of Cancer Epidemiology, 2014. 2014: p. 437971.
3. Veruttipong, D., et al., Age distribution, polyps and rectal cancer in the Egyptian population-based cancer registry. World journal of gastroenterology: WJG, 2012. 18(30): p. 3997.
4. Mohamed, A., et al., Clinico-Epidemiology Study of Colorectal Cancer in Menofia University Oncology Department. 2015.
5. Sung, H., J. Ferlay, and R.L. Siegel, Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin, 2021. 71(3): p. 209-249.
6. Rawla, P., T. Sunkara, and A. Barsouk, Epidemiology of colorectal cancer: incidence, mortality, survival, and risk factors. Prz Gastroenterol, 2019. 14(2): p. 89-103.

7. Mounir, A., et al., Epidemiology of Colorectal Cancer, Incidence, Survival, and Risk Factors: Cairo University Center of Oncology and Nuclear Medicine Experience. *The Egyptian Journal of Hospital Medicine*, 2022. 89(2): p. 7061-7070.
8. Hefni, A.M., Clinicopathological and Survival Outcome of Young Onset Colorectal Cancer: 10 Years Retro-spective Study in Upper Egypt. 2023
9. Gado, A., et al., Colorectal cancer in Egypt is commoner in young people: Is this cause for alarm? *Alexandria Journal of Medicine*, 2014. 50(3): p. 197-201.
10. Obeidat, K., et al., Colon cancer incidence and trends in the last two decades: A SEER based data analysis. 2023, American Society of Clinical Oncology.
11. Siegel, R.L., et al., Colorectal cancer statistics, 2023. *CA: A Cancer Journal for Clinicians*, 2023. 73(3): p. 233-254.
12. Pokharkar, A., et al., Young Vs Old Colorectal Cancer in Indian Subcontinent: a Tertiary Care Center Experience. *Indian Journal of Surgical Oncology*, 2017. 8.
13. Ghodssi-Ghassemabadi, R., et al., Clinicopathological features and survival of colorectal cancer patients younger than 50 years: a retrospective comparative study. *Journal of the Egyptian National Cancer Institute*, 2019. 31(1): p. 6.
14. Soliman, A.S., et al., Serum organochlorine pesticide levels in patients with colorectal cancer in Egypt. *Arch Environ Health*, 1997. 52(6): p. 409-15.
15. Abolhassani, M., et al., Organochlorine and organophosphorous pesticides may induce colorectal cancer; A case-control study. *Ecotoxicology and Environmental Safety*, 2019. 178: p. 168-177.
16. Hefni, A.M., Clinicopathological and Survival Outcome of Young Onset Colorectal Cancer: 10 Years Retro-spective Study in Upper Egypt. 2023.
17. Metwally, I.H., et al., Epidemiology and survival of colon cancer among Egyptians: a retrospective study. *Journal of Coloproctology*, 2018. 38(1): p. 24-29.